

Success in GRP

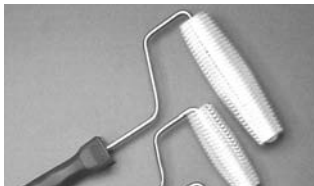
TWELFTH EDITION

DOWNLAND[®]

We are pleased and proud to offer the 12th Edition of our Downland Catalogue

It contains all the old favourites
PLUS
many new products

LOOK OUT FOR:



Barrel Rollers - Page 21



IBC Tank Heater - Page 46



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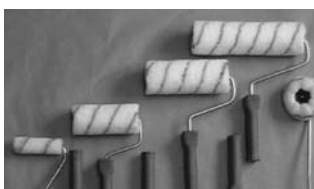
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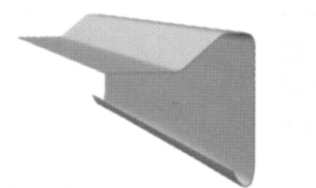
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INTRODUCTION

For over four decades K & C Mouldings (England) Ltd has been widely acknowledged as a leading supplier of specialist materials for the glassfibre reinforced plastics industry.

As the company's range of products and customer list has increased so they have developed an unrivalled reputation for quality of product and service.

K & C Mouldings wide range of materials, machinery, tools and ancillaries for the G.R.P. industry can satisfy even the most exacting customers.

FOR FAST DELIVERY OF HIGH QUALITY PRODUCTS CONTACT US

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ABOUT K & C MOULDINGS

K & C Mouldings (England) Ltd, was formed in 1959 to manufacture glassfibre reinforced plastics and to design and manufacture machinery for production.

An early success was the development of the first British glassfibre chopper which was sold in 1960 as an electrically powered tool for cutting 'E' glass roving.

This was swiftly followed in 1961 by the first commercially available diamond wheel trimmer in the world and in 1963 by the first British built resin/glass spray unit.

The company has been deeply involved in many of the other new processes that have been developed for the GRP industry, playing a leading part in developments such as cold press, resin injection and gelcoat spraying.

Despite the emphasis on mechanisation, K & C has not ignored the hand laminating sector and are proud of what they believe to be the largest and most varied stock of GRP ancillaries available anywhere in the world.

K & C Mouldings (England) Limited, broadly based and maintaining a technical lead, has remained privately owned with the personal involvement of the original directors.



EXPORTS

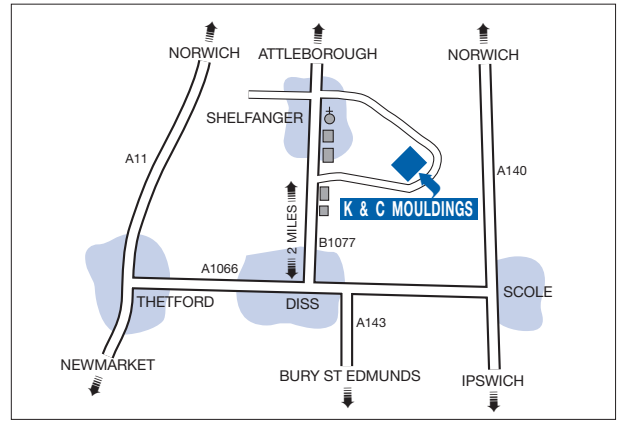
Our Export Department will handle quickly and efficiently all deliveries to any part of the World. We have a vehicle running to Heathrow Airport every working day and also deliver to local ports when necessary.

We handle all documents through the trade embassies and banks concerned and will accept payment in Sterling, U.S. Dollars or Euros.

Our Export Department also act as buyers of goods for export other than for the GRP industry and have close contacts with most UK manufacturers, and will be pleased to quote for any material our customers may need.

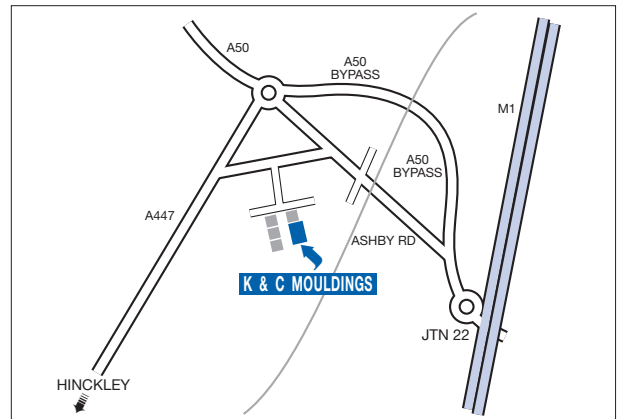
A G E N T S

Australia	Portugal
Austria	Spain
Canada	Sweden
Denmark	Switzerland
Finland	South Africa
France	Turkey
Greece	United States
Italy	Venezuela
Netherlands	West Germany



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Midland Depot:

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Off Ravenstone Road, Coalville, Leics LE67 3NQ

Terms

Strictly Nett Monthly.

All prices quoted are subject to the current rate of Value Added Tax, unless otherwise stated. Deliveries made in our normal delivery areas based on Diss and Coalville are carriage free. To other areas - in England, Wales and Scottish Mainland - goods are despatched by normal methods of transport, carriage paid on order of £200 and over excluding VAT. Special requests i.e. overnight courier will be subject to the full carriage cost.

We reserve the right to alter any price without prior notice being given.

Small Orders

We regret that due to the ever increasing administration costs our minimum Order Charge is £20.00.

Claims

Claims for damage or pilferage in transit or for non-delivery of part of the consignment should be notified in writing both to the carriers and to us within three days of delivery. In case of non-delivery we must be notified within three days of receipt of invoice otherwise owing to the carrier's time limits we are unable to claim for loss and the goods will be charged to the customer.

Contract Orders and Special Requirements

We would like the opportunity of quoting for bulk or contract orders and special requirements. We hold large stocks and are therefore able to give very competitive prices.

Development is continuous and specifications are subject to alteration at any time.

Whilst every care has been taken to check facts and dimensions in this catalogue no responsibility can be accepted for any misprints or inaccuracies.

The information contained in this catalogue is to the best of our knowledge true and accurate. Since the conditions under which our products may be used are beyond our control, recommendations are made without warranty or guarantee.

To place an order or for further information please contact us via:

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SECTION 1

PROCESSING EQUIPMENT

GLAS-CRAFT INDy SYSTEM RESIN/GLASS



The Glas-Craft INDy is a resin/glass dispenser system that represents the third generation of Glas-Craft's non-atomising technology. It has been tested, proven and documented to be the absolute best device for reducing styrene emission in open mould processing.

The INDy dispense system with chopper gun is supplied in cart-mounted form with integral hinged boom to carry hoses and rovings. It is fitted with a heater which maintains the temperature to enable the ideal spray patterns to be maintained.

The airmotor : pump ratio is 11 : 1 which allows the INDy to pump fire-retardent and filled resins with minimal output reduction and maximised efficiency. The INDy has an internal mix spraygun which matches perfectly the well-proven B-410 choppers. An integral flushing system is fitted to ensure easy cleaning and maintain full efficiency.

STANDARD SYSTEM COMPONENTS

	25 ft length Hoses
B-410 Chopper	With Gauges
SP-85 Catalyst Slave Pump	Regulators & Filter
188913-00 11:1 ratio Material Pump	
Cart, Mast & Boom mounting	
User Manual	

Nothing compares to the INDy in open mould processing for:

- Lowest levels of styrene emissions
- Most "workable", uniform dispense of resin and glass for quality results



INDy gun fitted with gel-coat nozzle

SYSTEM OPERATING SPECIFICATIONS

Air Requirements:	26 cfm @ 100 psi
Chopper Output	1 strand, 5lbs./min.
	2 strands, 7 lbs./min
Material Pump Output:	9kg
Catalyst Slave pump Range:	.5% to 4.5%

GLAS-CRAFT INDy SYSTEM GELCOATER



The Glas-Craft INDy gelcoater is based on the well-proven dispense base system with the high quality gelcoat spray pattern provided by an internal mix air assist containment spray gun. The INDy gelcoater is supplied as a portable cart system with resin heater to maintain the gelcoat at an optimum temperature to help maintain the spray efficiency.

The 11 : 1 ratio pump, combined with the resin heater, enables the INDy to pump any spray-viscosity gelcoat and maintain a high output, high quality spray pattern.

STANDARD SYSTEM COMPONENTS

INDy Internal-Mix Gun	25 ft length Hoses
Air Manifold w/Gauges, Regulators & Filter	
Infinitely Variable Catalyst Slave Pump	
11:1 ratio Material Pump	
5 gallon Stainless Steel Solvent Tank	
Portable Base	
User Manuals	

SYSTEM OPERATING SPECIFICATIONS

Air Requirements:	17 cfm @ 100 psi
	481 l/min @ 6.8 bar
Material Pump Output:	9kg
	4.73 l/min
Cat18913-00 11:1 ratio Material Pump	
Slave pump Range:	.5% to 4.5%

VERSATILITY

Two or more operating processes can often be combined on one multi pump INDy. Please contact us to discuss combining gelcoat spray and chopping glass in one system or adding a Pressure Fed Roller to a chopper system.

PFR II INTERNAL-MIX PRESSURE FED ROLLER SYSTEM



Around the world, fibreglass manufacturers are facing the challenge of reducing VOC emissions. Applying polyester resin directly onto the mould with a pressure fed roller is one of the most environmentally friendly methods of application. This "non-atomized" method of application produces no overspray and helps maintain a clean work environment.

The Glas-Craft PFR II has a maintenance-free dispense handle and an all stainless steel mix manifold. This mix manifold assures consistent catalization and virtually eliminates the possibility of material cross over. The PFR II can be used with 1½', 3', or 6' extension poles with either a 9" or 12" roller.

STANDARD SYSTEM COMPONENTS

PFR In-Line Dispense Gun	4:1 Solvent Pump
Stainless-Steel Mix Manifold	50ft Material Hose
1.5 ft. Extension Pole	1" Material Pump Pick-Up Kit
SP-85 Catalyst Slave Pump	Portable Base
11:1 Material Pump	Grounding Clamp

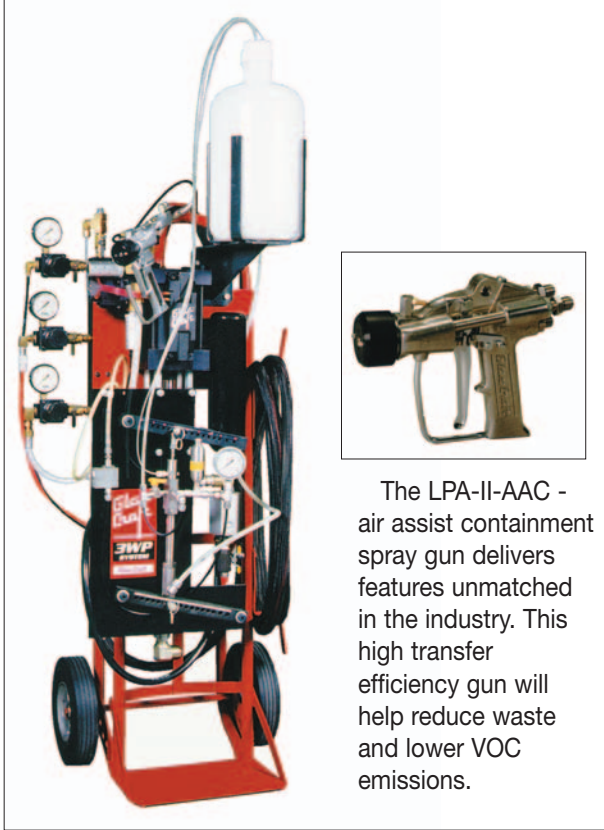
OPTIONAL SYSTEM COMPONENTS

Extension Pole	3 feet	Roller Cover	9 inches
Extension Pole	6 feet	Roller Cover	12 inches

SYSTEM OPERATING SPECIFICATIONS

Air Requirements:	17 cfm @ 100 psi
	481 l/min @ 6.8 bar
Material Pump Output:	9kg
	9.46 l/min
Catalyst Slave pump Range:	.5% to 4.5%

2WP PORTABLE SPRAY SYSTEM



The LPA-II-AAC - air assist containment spray gun delivers features unmatched in the industry. This high transfer efficiency gun will help reduce waste and lower VOC emissions.

For many years the Glas-Craft 3WP has been one of our most popular fiberglass systems. The Glas-Craft 2WP continues and adds to this tradition. The 2WP, like its running mate the 3WP, is extremely versatile, capable of fitting into any size workshop and accomplishing most processing requirements.

Each component on the 2WP is industry proven over many years.

AAC spray technology delivers the highest Transfer Efficiency of any fiberglass spray gun! That's right, any spray gun available, ...its a proven fact! And its available in writing!



STANDARD SYSTEM COMPONENTS

LPA-II-AAC Spray-Up Gun	25 ft length Hoses
Air Manifold w/Gauges, Regulators & Filters	
SP-85 Catalyst Slave Pump	
18913-00 11:1 ratio Material Pump	

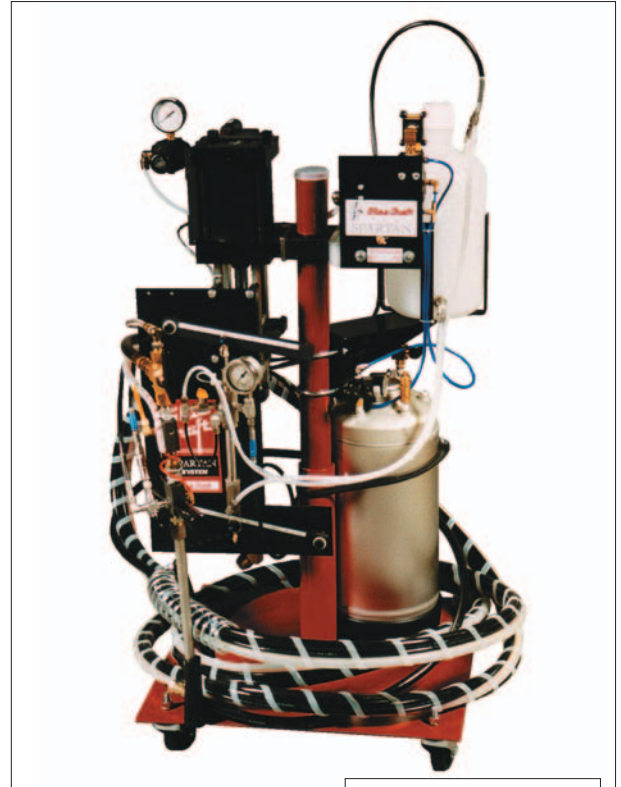
SYSTEM OPERATING SPECIFICATIONS

Air Requirements:	17 cfm @ 100 psi
	481 l/min @ 6.8 bar
Material Pump Output:	9kg/min 2.5 gpm
	9.46 l/min
Catalyst Slave Pump Range:	.5% to 4.5%

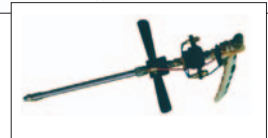
STANDARD SPARTAN RTM SYSTEM

The Standard Spartan RTM System is precision engineered for low pressure injection or resin transfer moulding (TRM) of polyester resins.

The 11:1 ratio pump develops sufficient pressure for large mouldings but is equally suitable for large quantities of small mouldings. The injection gun has a re-useable static mixing element and is simply and economically cleaned with a solvent flush followed by an air purge. The gun has a pressure trigger to reduce pressure shock to the mould and has a re-circulation facility which helps to keep pigments and fillers in suspension.



The Standard Spartan can be converted to an automated injection system - please request a separate leaflet.



STANDARD SYSTEM COMPONENTS

Inj Gun	25 ft length Hoses
Air Manifold w/Gauges, Regulators & Filters	
SP-85 Catalyst Slave Pump	
18913-00 11:1 ratio Material Pump	

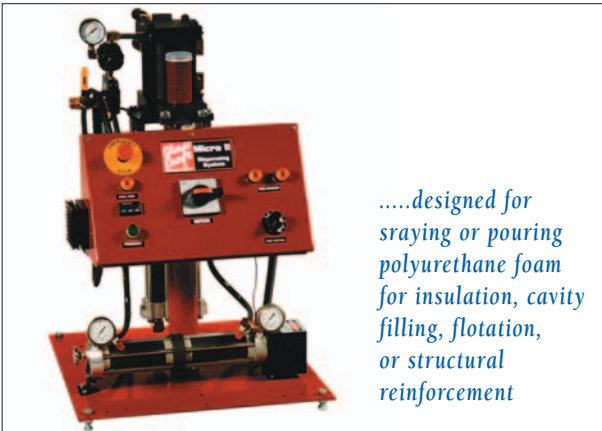
SYSTEM OPERATING SPECIFICATIONS

Air Requirements:	17 cfm @ 100 psi
	481 l/min @ 6.8 bar
Material Pump Output:	9kg/min 2.5 gpm
	9.46 l/min
Catalyst Slave Pump Range:	.5% to 4.5%

POLYURETHANE & POLYUREA DISPENSING SYSTEMS & EQUIPMENT



Micro II Dispensing Systemfeaturing the Glas-Craft Probler Gun



.....designed for
spraying or pouring
polyurethane foam
for insulation, cavity
filling, flotation,
or structural
reinforcement

The Glas-Craft Micro II Dispensing System sprays or pours a maximum of 8 lbs./min. of polyurethane foam. The Micro II System features the trouble-free, automatic air-purge Probler Gun. The Probler Gun, with a flat spray tip standard, is easy to use and maintain. A 22-foot heated hose assembly, with nylon protective sleeving is also standard on the Micro unit. Two positive displacement pumps are connected to one five-inch air motor to ensure the proper mixing pressure (1,600 psi) and ratio (1:1). The fluid pumps are fed by an easily installed Gravity Feed Kit.

SYSTEM OPERATING SPECIFICATIONS

Micro II Dispensing System

Max Output	3.6 kgs/min
Max Temp	71°C
Heater	2,000 Watt
Air Requirement	17cfm@100psi

Super Maxi Dispensing System

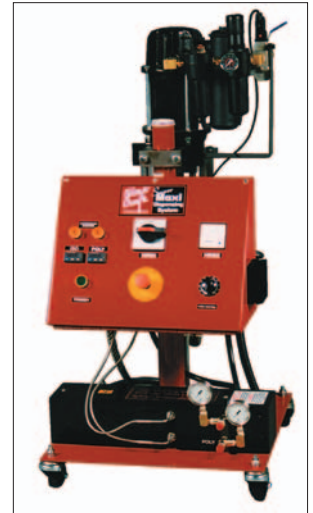
Max Output	8.2 kgs/min
Max Temp	88°C
Heater	6,000 Watt
Air Requirement	47cfm@100psi

MX II Dispensing System

Max Output	10 kgs/min
Max Temp	88°C
Heater	8,000 Watt
Air Requirement	47cfm@100psi

Super Maxi Dispensing Systemfeaturing the Glas-Craft Probler Gun

The Super Maxi is configured specifically for the coatings applicator requiring precise heat and pressure. The components and configuration are modelled after the industry-leading MX system. Like the Glas-Craft MX, the Super Maxi will generate up to 3,000 psi and 190°F, giving the best mix and control available in the industry. The Super Maxi can meter, mix and spray advanced polyurea and polyurethane material systems. designed for economical use in small-to-medium output applications, the Super Maxi will get the job done- both on location and in-house.



Every Super Maxi comes with the industry-standard Probler gun, the most trouble-free gun available for fast setting systems. In this competitive age, companies need every advantage they can get. Glas-Craft can help you improve your bottom line with the Probler gun and Super Maxi. Give us a chance to show you what we can do for your business!

MX II Dispensing Systemfeaturing the Glas-Craft Probler Gun

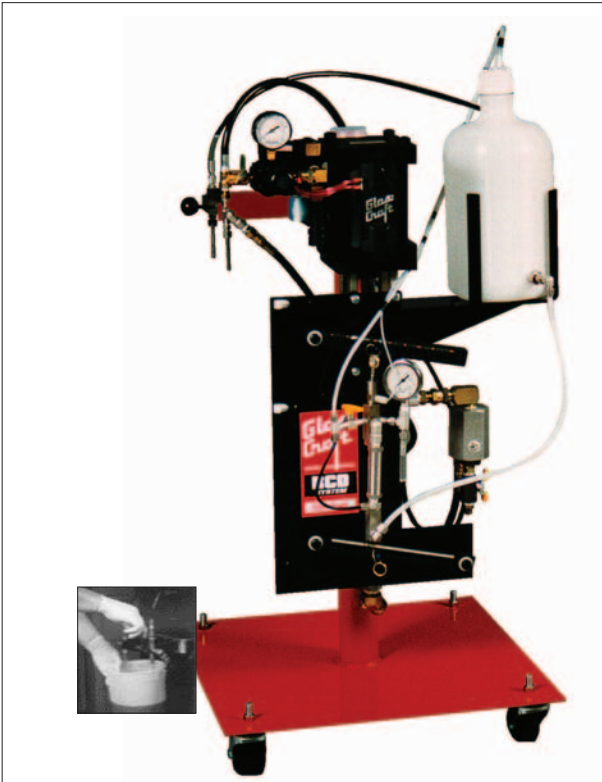


The MX II is a versatile system for spraying polyureas and polyurethanes. The 300' low voltage heated hose and low system profile make this a perfect contractor's unit. The MX II can develop a lot of pressure- 3,000 psi- for mixing polyureas and polyurethanes. With the digital temperature control, you will have

precise control over the material temperature, giving a better, more consistent mix. The thermocouples give an actual in line temperature reading- no temperature guesswork! Our new heater design features state-of-the-art design. There is not a more advanced heater available anywhere.

The New re-engineered M Series systems are running trouble free for longer, spraying better, and producing more. That's the Glas-Craft difference. Simple, reliable systems designed for today's applications. If you rely on a spray rig to make your bottom line, you can't afford not to look at the M Series.

RCD RESIN CATALYST DISPENSE SYSTEM



The RCD System offers unmatched accuracy and consistency when dispensing resin and catalyst into a bucket or other containers.

A positive displacement resin pump is used to dispense an exact amount of polyester with each pump cycle. A stainless steel catalyst pump is linked to the polyester pump. Catalyst percentages can be selected from .5% to 4.5%. The catalyst percentage selected will be locked-in. The selected percentage will be maintained every time material is dispensed from the RCD system.

A single handle on the dispense valve operates the unit. When turned to the "on" position, both polyester and catalyst are dispensed through individual tubes into the container. The RCD requires NO FLUSHING when the dispense valve is closed.

SYSTEM OPERATING SPECIFICATIONS

9kg polyester pump, 193 cc / cycle

Catalyst percentage - from .5% to 4.5%, percent increases in .25% increments

Portable base with castors for mobility

Single Handle Dispense Valve

Polyester and catalyst is dispensed through separate tubes

NO Flushing required

Filtered Material Pick-Up Wand and Supply Hose

Two-Gallon Catalyst Reservoir

WALL-MOUNTED EPOXY PROPORTIONING PUMP

The Twinpump is a hand operated metering pump intended to accurately dispense small quantities of unequally proportioned two-part resins. It is primarily for epoxy resin/hardener systems of either 3:1 or 5:1 proportions but may also be used for 1:1 or 1:11 polyurethanes. It consists of two, linked 600ml dispensers with adjustable stops to regulate shot sizes. It draws hardener directly from a 200 litre shipping drum and resin directly from an IBC Tank. It is designed to be wall-mounted with the pump inlets 1 to 1.5m away from the material container outlets.

Order ref. AOO18999



TECHNICAL SPECIFICATIONS

Pumps	Hand-operated piston type	
Shot size	Up to 600ml per pump	
Max output	@ 1:1	1200ml per shot
	@ 5:1	720ml per shot
	@ 6:1	700ml per shot
	@ 12:1	650ml per shot
Output speed	10 secs per shot dependent upon material ratio and viscosity	
Weight of pump	9.1kg	
Width	33cms	
Height	67cms	
Height of pump handle above floor	1.8m	
Suction hose length	2m	

RESIN CATALYST DISPENSING UNIT

With the present day high cost of resins it is very necessary to eliminate all possible wastage and to make certain that only the correct amount of material is used for each moulding.

To fill this need we have produced the Downland Resin Catalyst Dispenser Unit, which can save its cost in 12 months on time and materials saved.

Resins may be drawn from barrels or bulk storage tanks, and for safety the catalyst is drawn direct from the manufacturers containers.

The unit will dispense pre-set measured quantities of resin together with catalyst at ½-4% as required.

As only compressed air is used for operation there are no fire hazards, and the system is designed for trouble free operation.

The dispenser is based on a pair of linked Resin and Catalyst pumps, powered by an air cylinder and controlled by a mechanical metering device. Resin and Catalyst are drawn direct from the manufacturers containers and dispensed through adjacent non-drip valves into the operators mixing vessel.

The unit can dispense shots of Resin up to 10kgs in weight with divisions of 100 grms and the Catalyst percentage is adjustable between ½% and 4%.

As the Resin and Catalyst are dispensed through two separate valves there is no mixing chamber to flush out but at the end of the working day the outlet from the Resin non-drip valve will require removing and cleaning in solvent.

Order ref. AOO 14040



S P E C I F I C A T I O N

Size	33" x 25" x 63" (838mm x 635mm x 1584mm)
Weight	128lb (58kg)
Max output	300 kilos (1363 litres) per hour

WET LAMINATE GAUGE

The wet laminate gauge is a simple but effective tool for checking the thickness of uncured laminate on a mould, whether it is sprayed or mat laminate.

It is simple to use – place the footplate on the laminate, push the slide down, tighten the lockscrew, read the calibrated scale and wipe off the point.

Order ref. AAO 21013



POLYCON INDUSTRIAL SPRAY GUN

The Polycon is a simple but very effective spraygun that is primarily intended for spraying catalysed gelcoats but with the appropriate nozzles can also spray paints or slurries.

The Polycon is ideal for spraying gelcoats containing metallic jewels and colour changes can be effected in approximately 2 minutes.

The detachable gelcoat container is 1.5L capacity which is sufficient for approximately 2.5M², and for large mouldings a number of containers can be filled and pre-mixed requiring just the addition of catalyst prior to spraying.

The Polycon can be fitted with a small nozzle for a fine finish with low viscosity liquids or a large nozzle for outputs of up to 3Kg/min of more viscous materials.



Order ref. AOO 16351

S P E C I F I C A T I O N

Weight	620g
Container capacity	1 or 1.5L
Output (gelcoat through no. 6 nozzle)	250g/min
Air consumption	0.25-0.5M ³ (10-20 CFM) @ 4 Bar (60-80PSI) 4-5.5 Bar

Part No.	Description	Application
AOO16351	Complete gun	
AAO17180	1 L Container	
6359	1 L Lid	
5940	1 L Container & Lid	
6361	1.5L Container	
6360	1.5L Lid	
5630	1.5L Container & Lid	
4876	no.1 nozzle	Paints and release agents
4875	no.2 nozzle	
4874	no.3 nozzle	
4871	no.4 nozzle	Filler/Primer paints
4856	no.5 nozzle	
4857	no.6 nozzle	
4858	no.7 nozzle	gelcoats
4873	no.8 nozzle	
4870	no. 9 nozzle	Slurry

Resins

Metallic Jewels

RELEASE AGENT SPRAY GUN MKIV

A spray gun with a small nozzle and needle for applying P.V.A. and other low viscosity release agents. Enables a fine coat to be applied to the mould surface without the risk of runs spoiling the finish. More economical than applying by brush or sponge, with the certainty of complete coverage. Material may be left in the gun ready for use. Supplied complete with 1 pint (0.75 litre) nylon cup, 15 feet (4.5m) of air hose and tools.

Order ref. AAO 17259



S P E C I F I C A T I O N

Weight	1lb 9oz (0.7kg)
Bowl Capacity	1pt. (0.75litre)
Optimum Output	½oz (15grms)/minute
Air Consumption	1 cfm @ 15psi (0.03m ³ /min @ 1.0kg/cm ²)

DOWNLAND AUTOCAT MAJOR GELCOAT SPRAY SYSTEM

A breakthrough in gelcoat spraying with all the advantages of Catalyst-Injection systems and none of the disadvantages of Catalyst Pumps.

The Autocat Major is a unique two component spray gun with the gelcoat fed to the gun from a remote pressure pot of 25kg capacity. The catalyst is taken from a gun mounted catalyst bottle by a venturi and introduced into the resin stream through a hollow resin needle so that the catalyst is mixed intimately with the resin externally to minimise the flushing process.

Output from the gun is 600 grams per minute which ensures a spray rate of 12 - 15 square feet per minute.

The gun as supplied will produce 2% of catalyst, but alternative needles are available to produce 1% or 3% of catalyst.

Order ref. AOO 14001



S P E C I F I C A T I O N

Weight of Gun	1lb 12oz (0.8kg)
Weight of Complete Unit	60lbs (27kg)
Dimensions	42" (1050mm) x 14" (350mm) x 20" (500mm)
Maximum Output	1lb 5oz (0.6kg) per minute
Air Consumption	15cfm @ 70psi (0.42m ³ /min @ 4.9kg/cm ²)
Material Hose Length	6m (20')
Pressure Pot Capacity	25kg
Standard Catalyst Percentage	2

SOLVENT RECOVERY UNIT

Today's price of Acetone is a large part of the overheads in the G.R.P. moulding shops and in addition, the disposal of used acetone is becoming more difficult and expensive under the regulations governing toxic liquid waste disposal.

The Downland Solvent Recovery Unit will produce pure acetone from used material leaving a solid residue for disposal.

The unit is completely fail-safe and needs a minimum of operator supervision. A 200 litre drum is placed in the unit and filled with dirty acetone. The container is surrounded by water which is heated to just above the boiling point of acetone, 57°C. The acetone vapour is then passed through the water cooled condenser where it reforms into liquid acetone and runs into the clean acetone container, leaving the solids behind in the dirty acetone container ready for disposal.

The rate of recovery will of course depend on the degree of contamination of the acetone to be processed.

Approximate Recovery Rate 20-25 litres per hour.

Order ref. AOO 14071

S P E C I F I C A T I O N

Power Consumption	3PH 440V 6KW
Output	20 litres/hr (depending on degree of contamination)
Cooling Water	Minimum: ½ gallon/minute Maximum: 2 gallons/minute (depending on temperature)

A chiller unit is available for use where continuous water supply not available, or temperature of water too high, usually export only.

This unit is not suitable for recovering solvents with a boiling point above 75°C.



DOWNLAND ACETONE/RESIN DRUM PUMPS

The Downland Acetone Drum Pump is a sturdy hand operated semi-rotary pump designed to transfer acetone from 205L shipping drums to small containers for workshop use. It has been well proven under production conditions.

It is simple to operate - just screw it into the 2" BSP bung-hole of a 205L drum, loosen the 3/4" bung and push the handle backwards and forwards - and has an output of 20L per minute, making it faster to use than the conventional 3/4" drum tap.

It is considerably safer than the alternative drum taps as it obviates the possibility of leakage and helps users conform to COSHH regulations.

The acetone drum pump is normally supplied with a steel suction pipe to suit a 205L drum, but can also be supplied with a flexible suction pipe to enable the pump to be bolted to a wall and draw solvent from a 25L container.

The Downland Resin Drum Pump is a heavy duty hand-operated semi-rotary pump designed to transfer laminating resin from 225kg shipping drums to mixing vessels.

It is based on our well-proven acetone pump with caged ball valves to ensure that viscous resins can be dispensed quickly and easily.



Acetone Drum Pump - Order ref. AOO 15679

S P E C I F I C A T I O N

Overall length	140cms
Steel suction pipe length	85cms
Height of outlet above drum	40cms
Weight	8.5kg
Output	20L acetone per minute

Resin Drum Pump - Order ref. AOO 17330

S P E C I F I C A T I O N

As above except Output	12kg resin per minute
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DOWNLAND RESIN TRANSFER PUMP MODEL 15A

The Downland Resin Transfer Pump is a double diaphragm pump with a steel suction pipe to enable it to pump from 200L resin drums. It is constructed from components that are compatible with polyester resins and many other chemicals.

the pump is intended to be placed on the top of a vertical 200ml resin drum with the suction pipe entering the drum bung-hole and is supplied with a flexible outlet pipe.

The pump is a 1:1 system so that an air pressure of 6 BAR applied to the pump will produce an outlet resin pressure of 6 BAR. It is controlled either by the outlet lever valve or the inlet needle valve which will also vary the pump speed and output.

Order ref. AAO17238



S P E C I F I C A T I O N

Pump weight	5.5Kg
Overall height	110cms
Max working pressure	8-6 BAR (125 PSI)
Optimum working pressure	4-6 BAR (60-90 PSI)
Max solid particle size	2mm
Air inlet	1/4" BSP
Fluid inlet/outlet	1/2" BSP
Resin output	Up to 40L/min (dependent upon resin viscoisty)

AM4 MIXER



The AM4 mixer is designed to fit on any open topped container and is widely used for mixing pigments into gelcoats and fillers into laminating or casting resins. The AM4 Mixer is driven by a powerful variable speed airmotor which can be run at full speed and power for initial mixing and then slowed down to hold mixed materials in suspension until required.

The AM4 will easily mix pigments into 100kg of laminating resin or 25kg of gelcoat and dependent upon the type of filler used can mix up to 50kg of 2:1 filler:casting resin.

Order ref. A00 16826

S P E C I F I C A T I O N

0.5hp at 1000rpm; 1 hp at 2000rpm	
Air consumption	14.2 litre/sec 30cfm at 80psi
Supplied with 3 shafts	12", 18" and 24"
Paddle diameter	7"
Weight	8.2kg

AM5 KEG MIXER

The Keg Mixer is an improved up-rated version of our well-proven AM4 Mixer. It is intended specifically for mixing pigments into the modern lightweight gelcoat cans.

It is powered by a quiet-running pneumatic motor which directly drives a steel shaft and two aluminium bladed propellers.

The mixer assembly is mounted on an adjustable clamp which slides on the vertical pillar to enable the gelcoat can to be positioned or removed. The base plate is fitted with a simple clamp to locate differently sized cans correctly.

The Downland Keg Mixer quickly and efficiently mixes in pigment with minimal air inclusion.

Order ref. A00 16823



Specification:

Overall Height:	107cm
Overall Width:	23cm
Overall Depth:	56cm
Weight:	18kg
Shaft Length:	56cm
Propeller Diameter:	13cm
Max. Speed:	3000 (with load)
Air Consumption:	67scfm (1.9m ³ /m)

IN DRUM MIXER

The Downland In-Drum mixer is a powerful and dependable, pneumatically driven unit for use in vertical 200L drums of laminating resin.

It has a variable speed airmoter that can be run at full speed to mix pigments or liquid additives into resin, or at low speed to keep fillers or pigments in suspension. The mixer motor is effectively silenced and as it does not present a fire hazard it can be used continuously adjacent to the working area. The mixer will mix 5% of polyester pigment into 200L of resin in 15-30 minutes at 20°C but will require longer mixing at lower temperatures.

Order ref. AOO 16827



Specification:	
Overall Length:	86cms
Shaft Length:	74cms
Weight:	8.2kgs
Mixer Blade Size:	25cms -OPEN
Max Speed:	3000 rpm
Air Pressure:	90psi (6.2 Bar)
Air Consumption:	14.2L/sec (30cfm)
Speed Control:	Needle Valve

IR 2000 TANK MIXER

The Downland Tank Mixer is a pneumatic double-propeller mixer for use on one tonne tanks. It can be run at low speed to keep fillers in suspension or at high speed to mix pigments into laminating resins.

The drive unit is a quiet running 1.1h.p. pneumatic motor mounted on a universal adjustable frame and directly coupled through an outrigger bearing to a stainless steel shaft with two 4 blade aluminium propellers. The tank mixer is an essential aid to moulders using filled or pigmented resins in one tonne tanks.

Order ref. AOO 16819



Specification:	
Overall Height:	123cm
Overall Width:	33cm
Weight:	18kg
Shaft Length:	106cm
Propeller Diameter:	14.5cm
Max Speed:	3000 (with load)
Air Pressure:	90psi (6.2 Bar)
Air Consumption:	67scfm (1.9m ³)

*We recommend that pigment pastes are diluted with an equal amount of resin before being poured into the tank for mixing.

BENCH MIXER

A small air operated mixer suitable for mixing fillers, pigments, catalyst, etc., into gelcoat and laminating resins.

Will mix 10-12lb (4.5-5.5kg) per batch. Speed is infinitely variable up to 6,000rpm by needle valve air control, enabling the operator to choose the correct speed for the job.

Order ref. AOO 16825



S P E C I F I C A T I O N

Height of column	24" (609mm)
Steel base plate drilled for bolting to bench	
Air motor fitted with efficient silencer	
Complete with 15' (4.5m) of air supply hose	
Air consumption	3.78 litres/sec 8cfm @ 80psi
H.P.	0.15
Weight	11lb (5kg)

MIXING TANK

The 25 gallon (113 litre) mixing tank, illustrated, is strongly constructed in mild steel.

The conical base allows for complete emptying through the leak-proof full volume resin tap.

Also supplied with heavy duty castors where a mobile unit is required.

Order ref. AOO 16829

S P E C I F I C A T I O N



Tank diameter	23" (584mm)
Tap height	24" (609mm)
Overall height	50" (1270mm)
Base	24" x 24" (609mm x 609mm)

EPI-MIXERS

- Labour-saving tools that take the stick out of mixing.
- A fast mixing method that can save up to 75% of mixing time
- Ensures a consistent and homogenous mix every time minimising air entrainment.
- Are technically designed to get the best results and optimum performance from the material

MR2 Series

Multi-purpose Resin and Gelcoat mixer
Drill requirements: Medium duty 1/2" chuck
Mix action: Medium shear, spiral; 2 blade

S P E C I F I C A T I O N

MR2 80

Mix Size	5kg/5ltr
Mixing Head	80mm
*Drill Capacity	1/2" chuck

MR2 110B

Mix Size	15kg/15ltr
Mixing Head	110mm
*Drill Capacity	1/2" chuck

*Recommended drill speed for mixing liquids and slurries is 450-900 rpm



Order ref. AOO 16822 (MR2 80)

Order ref. AOO 16821 (MR2 110B)

DOWNLAND DISPENSERS

Downland dispensers provide a safe, efficient and accurate method of dispensing the corrosive and inflammable liquids commonly used in the glassfibre reinforced plastics industry.

They are accurate, which improves laminate quality; they improve safety by eliminating decanting and increase both productivity and profitability as they are faster and easier to use than the conventional manual systems.

Two models are available; 100ml for MEKP catalyst and other low-viscosity liquids; and 600ml, which in addition to dispensing catalyst is also suitable for dispensing resin and gelcoat.

GLASS TOPPED WALL MOUNTED CATALYST DISPENSER

The glass topped catalyst dispenser is a hand operated metering pump which safely and efficiently dispenses MEKP catalyst. It is an easy to use unit. The operator pushes the handle upwards to draw the required amount of catalyst from a bulk container into the calibrated glass scale, and then pulls the handle downwards to expel the catalyst into his mixing bucket.

The parts of the dispenser that come into contact with catalyst are made from glass, stainless steel, polypropylene or polythene and are mounted on a strong steel back plate which has to be bolted to the wall at a convenient height. The measuring scale is calibrated up to 100 ml and multiple shots can be dispensed without difficulty.

This dispenser can be used to meter other liquids with a similar viscosity to catalyst, but liquids such as cobalt accelerator **must not** be dispensed from a unit which has previously been used for MEKP.

Stock no. AOO 16020
Output 600ml/min



CART MOUNTED DISPENSER

The cart mounted dispenser is produced by mounting a 100ml glass topped, wall mounted catalyst dispenser on a two-wheeled cart designed to carry a 30kg keg of MEKP catalyst.

The cart enables the catalyst dispenser to be placed adjacent to the working area — particularly useful for large mouldings — and then wheeled outside at the end of the shift for storage. The cart is fitted with a drip-pot and a keg retainer.



600ML WALL MOUNTED DISPENSER

The 600ml dispenser is a large capacity hand operated metering pump which will dispense MEKP catalyst, polyester phenolic and epoxy resins and polyester gelcoats.

The dispenser is supplied with a wall-mounting bracket which enables it to draw material directly from a 200ml drum positioned beneath it. The maximum capacity per cycle is 600ml and multiple cycles can be produced without difficulty.

Note: Gelcoats must be at a minimum temperature of 18°C.



SECTION 2

LAMINATING TOOLS

BRUSHES

Low cost industrial brushes, with solvent resistant settings and plastic handles, suitable for use with all types of resins. Used by the majority of glassfibre moulders.



Order ref. per dozen

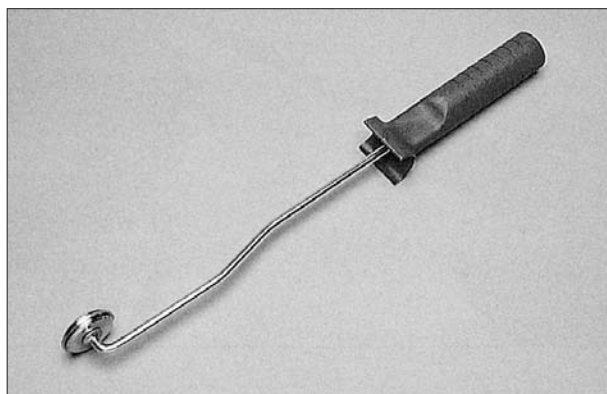
AOO 15980 1/2" (12mm)	AOO 15985 3" (75mm)
AOO 15982 1" (25mm)	AOO 15986 4" (100mm)
AOO 15983 1 1/2" (40mm)	AOO 15987 6" (150mm)
AOO 15984 2" (50mm)	

Packed in dozens

CORNER ROLLERS

For consolidating laminates in sharp corners, and places inaccessible to normal rollers.

5/16" (8mm) wide x 1 1/2" (37mm) diameter, three radiused ribs.



Order ref. AAO 17467

SPRING LAMINATING ROLLERS

A well proven laminating roller which is ideal for consolidating on curved surfaces, whether internal or external.

Comprises a steel spring, so mounted that it is able to flex in any direction.

Easily cleaned, but should not be burnt off, to avoid spoiling the spring temper. Available in 2 sizes.

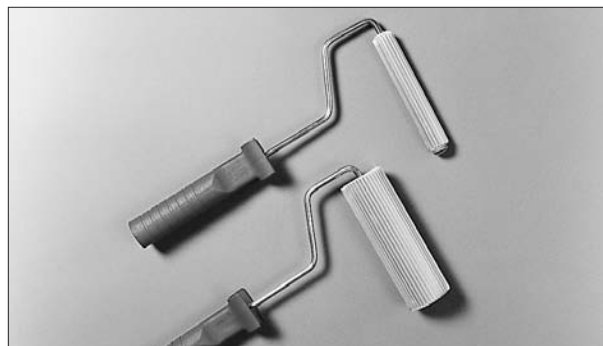


S P E C I F I C A T I O N

Order ref. AAO 17485. Overall diameter	1 5/8" (41mm)
Overall length	5" (127mm)
Order ref. AAO 17484. Overall diameter	1" (26mm)
Overall length	3 1/2" (90mm)

PADDLE ROLLERS

Manufactured from extruded aluminium, with plastic end caps, these rollers give quick wet out and good air removal of the laminate. They are easily cleaned, lightweight, and durable, used by moulding shops throughout the world.



Order ref.

AAO 17420 2" x 7/8" dia. Complete	AAO 17426 5" x 7/8" dia. Refill
AAO 17421 3 1/2" x 7/8" dia. Complete	AAO 17427 6" x 7/8" dia. Refill
AAO 17422 5" x 7/8" dia. Complete	AAO 17428 2" x 1 3/4" dia. Complete
AAO 17423 6" x 7/8" dia. Complete	AAO 17429 3 1/2" x 1 3/4" dia. Complete
AAO 17424 2" x 7/8" dia. Refill	AAO 17430 5" x 1 3/4" dia. Complete
AAO 17425 3 1/2" x 7/8" dia. Refill	AAO 17431 6" x 1 3/4" dia. Complete
AAO 17432 12" x 1 3/4" dia. Broom Handle Fitting	

PTFE ROLLERS

Downland PTFE laminating rollers are accurately machined from solid PTFE with a highly defined thread-form that produces a high-quality wet-cut on both chopped strand mat and sprayed laminates. The non-stick nature of PTFE ensures that if resin hardens in contact with the roller a sharp tap will cause it to shatter and fall off, and although the rollers are initially expensive, their long-life means that they are in fact economical.

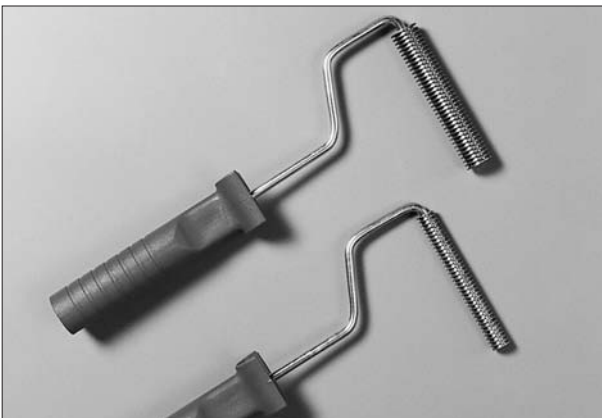


Order ref.

AAO 18690 2" x 1/2" dia. Complete	AAO 17457 2" x 1" dia. Complete
AAO 18691 3 1/2" x 1/2" dia. Complete	AAO 17458 3 1/2" x 1" dia. Complete
AAO 18692 5" x 1/2" dia. Complete	AAO 17459 5" x 1" dia. Complete
AAO 18693 6" x 1/2" dia. Complete	AAO 17460 6" x 1" dia. Complete

STEEL RIBBED ROLLERS

A sturdy roller machined from solid steel bar with ribs designed to give maximum consolidation of a laminate with good air removal qualities.



Order ref.

AAO 18680 2 1/4" x 1/2" Complete	AAO 18684 2 1/4" x 3/4" Complete
AAO 18681 3 1/2" x 1/2" Complete	AAO 18685 3 1/2" x 3/4" Complete
AAO 18682 5" x 1/2" Complete	AAO 18686 5" x 3/4" Complete
AAO 18683 6" x 1/2" Complete	AAO 18687 6" x 3/4" Complete

SPIRAL BRISTLE ROLLER

A high quality laminating Roller designed specifically for the G.R.P. Industry.

The Spiral bristle roller consists of a spirally wound metal core into which are embedded bristles which penetrate the laminate to remove air bubbles whilst producing a very effective consolidating action.

The roller is securely held on the frame by a device which allows the end of the roller to fit into a tight corner and eliminates clips and nuts so that the roller can be simply pulled off for cleaning or replacement. The roller has a special handle which will accept an extension and can be hung on the side of the solvent container to allow excess solvent to drain off.

The design of the spiral bristle roller almost totally eliminates splashing and makes it one of the cleanest rollers to use.



Order ref.

AAO 17346 50 x 22mm dia. Complete
AAO 17347 100 x 22mm dia. Complete
AAO 17349 150 x 22mm dia. Complete
AAO 17350 50 x 28mm dia. Complete
AAO 17351 100 x 28mm dia. Complete
AAO 17353 150 x 28mm dia. Complete

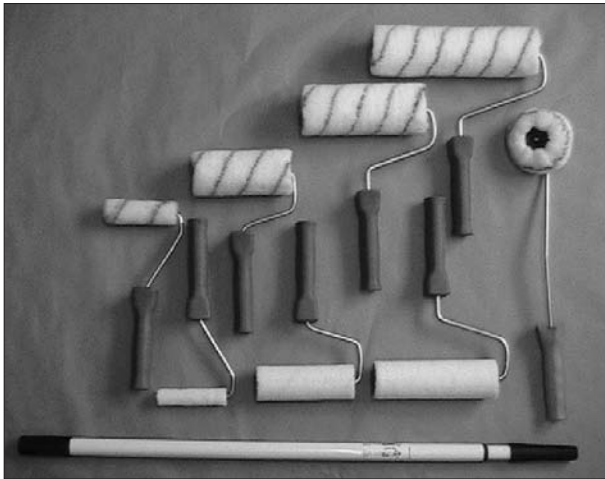


HI-TECH LAMINATING ROLLERS

The new laminating rollers are high quality technically advanced tools specifically for G.R.P. laminating.

The top quality BLUESTRIPE WOOLPILE rollers are made with a long pile nylon fibre fabric that is welded to the core for perfect adhesion. The fibres are thermo "crimped" which helps them pick up, hold and distribute resin. The rollers have an internal plastic grip that eliminates nuts and washers to facilitate roller replacement.

The DAKOTA MOHAIR rollers are for laminators who prefer a short pile for spreading resin or applying gel-coat. They have an integral plastic grip that will fit any steel handle without the use of nuts and washers.



S P E C I F I C A T I O N

Bluestripe Woolpile Roller Refills

Stock No	Length	Diameter	Fibre Length	Bore
AA018695	50mm	90mm	30mm	6mm
AA018696	100mm	35mm	10mm	6mm
AA018697	140mm	70mm	18mm	8mm
AA018698	180mm	70mm	18mm	8mm
AA018699	250mm	80mm	18mm	8mm

Dakota Mohair Roller Refills

AA018700	100mm	25mm	4mm	6mm
AA018701	140mm	50mm	4mm	6mm
AA018702	180mm	55mm	4mm	8mm

Handles for Bluestripe and Dakota Rollers

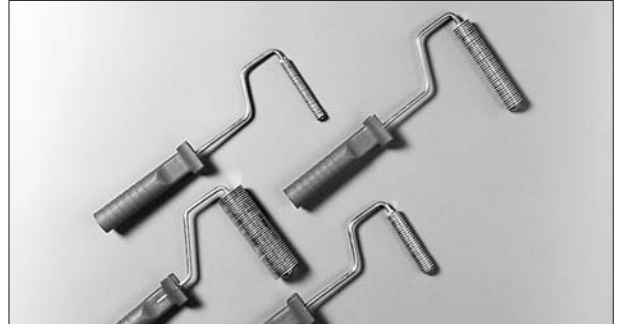
Stock No	To Suit Refill Length	Spindle Length	Frame Length	Diameter
AA018703	50mm	40mm	420mm	6mm
AA018704	100mm	80mm	270mm	6mm
AA018705	100mm	80mm	550mm	6mm
AA018706	140mm	140mm	240mm	6mm
AA018707	180mm	180mm	270mm	8mm
AA018708	250mm	250mm	280mm	8mm
AA018709	Telescopic pole to suit any handle (80cm to 135cm)			

Please note:- Roller refills and handles must be ordered separately

METAL WASHER ROLLERS

These rollers are constructed of heavy gauge plated steel washers with steel spacing washers, retained on the shaft with a starlock retaining stud.

Available in 1/2"(12mm), 3/4"(19mm), 1"(25mm) and 1 1/2"(37mm) diameters and in lengths of 2"(50mm), 3 1/2"(88mm), 5"(127mm) and 6"(152mm).



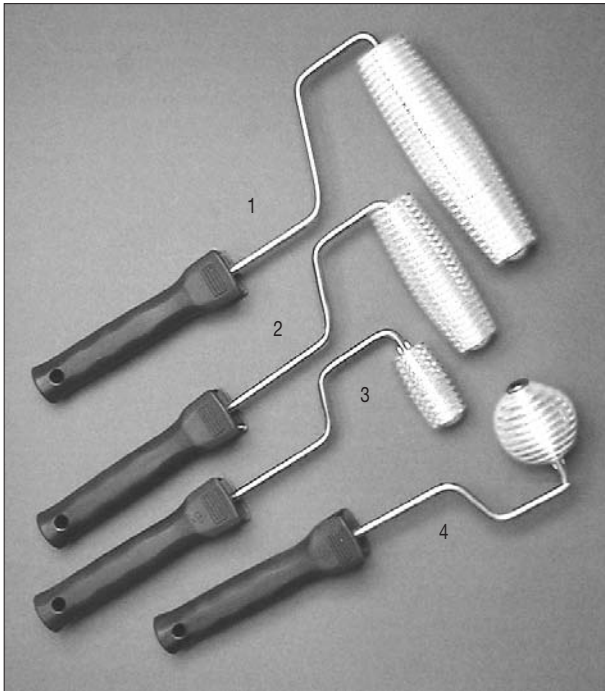
Order ref.

AAO 17370 2 1/4" x 1/2" dia. Complete	AAO 17386 2 1/4" x 1" dia. Complete
AAO 17371 3 1/2" x 1/2" dia. Complete	AAO 17387 3 1/2" x 1" dia. Complete
AAO 17372 5" x 1/2" dia. Complete	AAO 17388 5" x 1" dia. Complete
AAO 17373 6" x 1/2" dia. Complete	AAO 17389 6" x 1" dia. Complete
AAO 17378 2 1/4" x 3/4" dia. Complete	AAO 17396 2" x 1 1/2" dia. Complete
AAO 17379 3 1/2" x 3/4" dia. Complete	AAO 17397 3 1/2" x 1 1/2" dia. Complete
AAO 17380 5" x 3/4" dia. Complete	AAO 17398 5" x 1 1/2" dia. Complete
AAO 17381 6" x 3/4" dia. Complete	AAO 17399 6" x 1 1/2" dia. Complete
AAO 17400 12" x 1 1/2" dia. Broom Handle Fitting	

BARREL ROLLERS

Downland Barrel Rollers are solid PTFE fin laminating rollers with a rounded outer surface to conform to moulds with curved concave surfaces. The rollers are easily cleaned in acetone but if resin hardens in contact with the PTFE a gentle tap will cause it to crack and fall off. The rollers have comfortable plastic handles and the rollers are retained on the steel frames with starlock fixings.

Illustration No.	Stock No.	Barrel Dimensions Length x Dia	Overall Length
1	AA017466	150 x 45mm	45mm
2	AA017462	100 x 38mm	38mm
3	AA017464	50 x 30mm	30mm
4	AA018715	50 x 57mm	30mm



12" WIDE ROLLERS with broom handle fitting

Ideal for working on large laminates these rollers are available as paddle, mohair, woolpile, and metal washer rollers.

Broom handles not supplied.

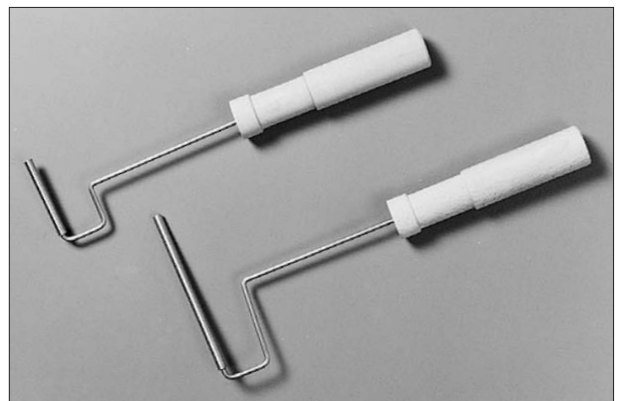
Order ref.	
AAO 17359	Mohair 12" x 2" dia.
AAO 17432	Paddle 12" x 1 3/4" dia.
AAO 17400	Metal Washer 12" x 1 1/2" dia.
AAO 17497	Woolpile 12" x 3" dia.



BOLT ROLLER

The bolt roller is the smallest diameter roller available and is ideal for consolidating in tight corners and narrow grooves. It consists of a 6mm diameter threaded section retained on its handle by a patented 'invisible' clip which ensures that snagging cannot occur. Available in both 50mm and 100mm lengths.

Order ref.	
AAO 17482	50mm x 6mm dia.
AAO 17483	100mm x 6mm dia.



SECTION 3

AIR TOOLS

We offer a full range of pneumatic tools as experience has shown that in any commercial industrial application they offer many advantages over electrically powered tools. They are more expensive than electrical tools but the longer life and better safety record mean that they are almost always less expensive on a long term basis.

PNEUMATIC TOOLS:

- Can be used in wet conditions
- Can operate in a glassfibre dust laden atmosphere
- Can operate in an inflammable atmosphere
- Can be stalled without damage
- Can be serviced easily and quickly
- Have long life expectancy

PROPER AIRLINE INSTALLATION

There is much to be gained by installing the air line in the correct manner, and by including suitable air line filters, pressure regulators, and lubricators, as detailed below.

Air mains and lines should be large enough to avoid excessive pressure loss under conditions of maximum flow. They should be installed with as few restrictions as possible if the cost of compressed air is to be kept to a minimum. Sharp turns in piping should be avoided for more efficient air flow and economical air power.

It is advisable to pitch the mains in the direction of air flow so that both gravity and air flow will carry the water to traps or water legs located at frequent intervals. These should be drained regularly and never allowed to become full and inoperative.

To aid in preventing condensed moisture from reaching the tools, down pipes or hose connections should never be taken directly from the bottom of air pipes or mains. Connection should be made at the top of the main and a long radius return bend used.

Leaders, valves and hose connections should be large enough to pass the maximum amount of air required by the tool on the line.

REGULATION - USE THE CORRECT OPERATING PRESSURE

In choosing an air pressure regulator, attention must be paid to the regulation characteristics and the flow characteristics. The first determines the ability of the pressure regulator to maintain a constant and even delivery pressure as selected, independent of the fluctuations in the primary pressure. The closer this control the better the regulator.

Flow characteristics demonstrate the ability of the regulator to maintain its secondary or delivery pressure under varying air demand. Here again the regulator which provides the most even pressure will be most desirable.

FILTRATION - USE OF CLEAN COMPRESSED AIR

The compressed air filter should obviously remove from the air line solid materials, such as pipe scale, dirt, etc., which will accumulate because of corrosion inside the pipe and because of dirt entering from the atmosphere.

The filter should also be capable of removing liquids such as water and oil, which otherwise may be carried along by the compressed air. Water will have an adverse effect on any internal parts of the tools, etc. due to corrosion, and it will also have a detrimental effect during such operations as spray painting.

In the choosing of filters the two important points are:

- a. Efficient removal of dirt, water, etc.
- b. To effect its removal with the least possible pressure drop, all extra pressure drop being a further waste of air.

USE THE CORRECT LUBRICANT

For any apparatus driven by compressed air it is obvious that proper lubrication can best be achieved by the installation of an air line lubricator ahead of such mechanism. These air line lubricators function by introducing a fine mist or fog of oil into the compressed air supply and thence on to the working parts of the mechanism. The rate of supply of oil is readily adjustable and visible and such supply only occurs when the mechanism works. Over-lubrication is thus prevented and oil does not contaminate the operator of the workpiece.

DOWNLAND AIRLINE OIL

A special oil for use only with air-operated tools. Gives perfect mist lubrication whilst retaining the properties of a low viscosity oil. Contains a corrosion inhibitor. Available in 1ltr and 5ltr containers.

Order ref.

AOO 15788 Airline Oil 1 litre

AOO 15789 Airline Oil 5 litre

AIR LINE FITTINGS

We stock a full range of air line fittings, and hoses for workshop air line installations.

The illustrations show various air filter and air lubricator units.

1. Air filter with pressure regulator and gauge, to provide a supply of clean air at constant pressure for spray guns.

Order ref. AOO 15775

2. Air filter with air lubricator, to provide clean, lubricated air for all pneumatic tools working at mains pressure. Where speed control is required an air pressure regulator is fitted between the air filter and the lubricator.

Order ref. AOO 15776

3. Air blow gun for general cleaning down and also for parting mouldings from the mould.

Order ref. POO 01384

4. Air filter with air lubricator for pneumatic tools, with additional take off for pressure regulated clean air for spraying etc.

Order ref. AOO 15777

5. Air Lubricator.

Order ref. POO 02716

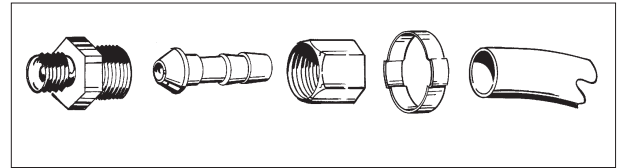
6. Air Filter.

Order ref. POO 02715

7. Quick release plug-in air line fittings, in 1/4" BSP and 3/8" BSP sizes.

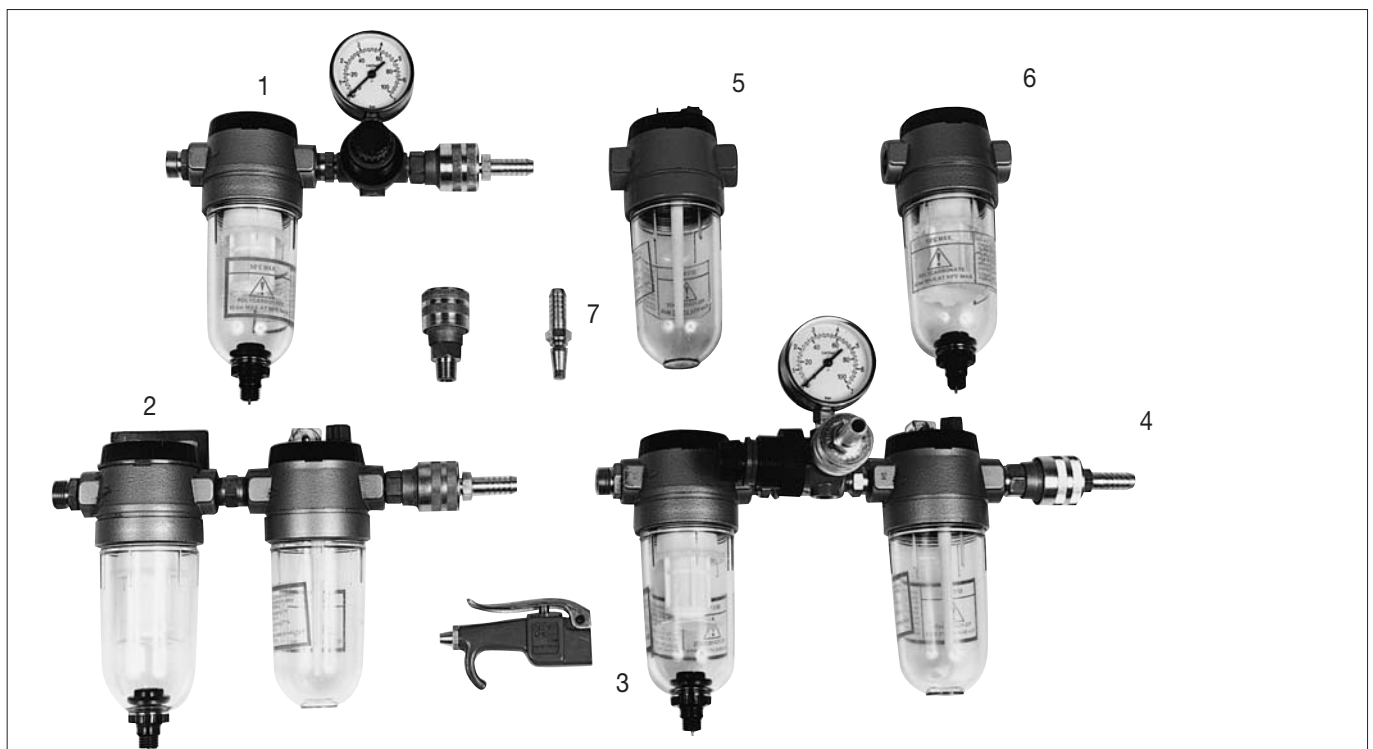
SCHRADER FITTINGS ONLY		
SIZE	CHECK UNIT	SHANK
1/4" BSP	P0001179	P0001386
3/8" BSP	P0001178	P0001387

SHANKS WITH INTERNAL THREAD	
1/4" BSP MALE	P0000469
1/4" BSP FEMALE	P0004348



8. We also supply all fittings and hose in 30 metre lengths so that customers can easily make airline to their own requirements.

DOUBLE BODIES UNIONS	STEMS
1/4" x 1/4" - P0000387	1/4" x 1/4" P0001192
1/4" x 3/8" - P0000012	3/8" x 3/8" P0000719
3/8" X 3/8" - P0000605	1/2" X 1/2" P0003693
3/8" X 1/2" - P0001144	3/8" X 1/4" P0003692
NUTS	'O' CLIPS
1/4" BSP P0001191	To Suit 1/4" Hose - P0001997
3/8" P0000716	3/8" Hose - P0000865
1/2" P0002423	1/2" Hose - P0001980
AIRHOSE	BLUE REINFORCED
SIZE	REF NO.
1/4" ID	P0002808
3/8" ID	P0002809
1/2" ID	P0002810



2" DIAMOND WHEEL TRIMMER TYPE AC

The Downland Type AC Diamond Wheel Trimmer is based on the machine developed and patented by us over 25 years ago.

A well-balanced, light-weight hand tool, it will produce a fast cut, leaving a smooth and clean edge irrespective of whether the cut is made from the face or back of the material.

Precision made, and driven by a heavy duty air motor, it is built for continuous use under production conditions.

The trimmer is supplied complete with a 50/70 grit diamond wheel although a 40-50 grit wheel which will produce a slightly faster, coarser cut can be supplied.

Other wheels are available for special requirements. Replacement wheels always in stock.

All trimmers may be fitted with dust extractors.

Order ref. AAO 16196



S P E C I F I C A T I O N

Speed	6000rpm
Air consumption	21cfm 10 litre/sec
Weight	1lb 13oz (0.82kg)
Depth of cut	3/8" (9mm)
Diameter of wheel	2" (50mm)

3" DIAMOND WHEEL TRIMMER TYPE AC

A larger version of our well-known 2" (50mm) trimmer giving a maximum depth of cut of 5/8" (16mm).

Fitted with a 3" x 0.060" (76mm x 1.55mm) diamond tipped wheel, producing a quick cut and excellent non-chip finish.

All trimmers may be fitted with a dust extractor.

Supplied complete with 15 feet (4.5m) of air hose.

Order ref. AOO 16197



S P E C I F I C A T I O N

Speed	6000rpm
Air consumption	21cfm 10 litre/sec
Weight	2lb (0.9kg)
Depth of cut	5/8" (16mm)
Diameter of wheel	3" (75mm)

DOWNLAND SPEEDTRIM

The Downland Speedtrim is a diamond wheel trimmer designed for the fast, clean trimming of glass fibre mouldings. It has an unobtrusive integral dust collector hood which helps to improve the working environment and ensures maximum production.

The Speedtrim is powered by a precision built heavy duty airmotor suitable for continuous operation. The airmotor has a rear exhaust which directs the expelled air away from the cutting area and consequently helps to further improve the operating environment.

The Speedtrim is a well-balanced lightweight hand tool which produces a smooth, clean cut edge irrespective of whether the cut is made from the Gel face or rear of a glass fibre laminate.

The Speedtrim is supplied fitted with either a 2½" or 3" diamond wheel and the operator can if he wishes easily change from one wheel to another.

The Speedtrim should be fitted with a 3" diameter wheel if maximum depth of cut is required and replaced with a 2½" diameter wheel or spoked wheel if a radius cut is required.

Order ref. AOO 16073 2½" Speedtrim
Order ref. AOO 16074 3" Speedtrim

S P E C I F I C A T I O N

Speed	12000rpm
Air Consumption	6.1-16 litre/sec 13-34cfm @ 80psi
Weight	1.2kg
Depth of cut with 2½" wheel	9mm
Depth of cut with 3" wheel	15mm



4" HEAVY DUTY DIAMOND WHEEL TRIMMER

The most powerful of our range of Diamond Wheel Trimmers, this unit will handle quickly and easily all heavy cutting and trimming jobs up to its maximum depth of cut.

The extra power of this trimmer is obtained by a higher air consumption and the compressed air supply must be capable of producing 25-30cfm per minute for maximum cutting speed although it will run on 15cfm at reduced power.

An air line filter and oiler must be used to ensure trouble-free running.

Our dust extractor unit will fit this trimmer or the dust extractor head only may be supplied to connect to existing dust extractor systems.

Supplied complete with 4" dia. x ¼" (101mm dia. x 1.55mm) thick diamond tipped cutting disc, 20 feet (4.5 metres) of ½" (12.5mm) bore air hose and tools.

Order ref. AOO 16077



S P E C I F I C A T I O N

Speed	12500rpm
Weight	3¾lb (1.7kg)
Air consumption	14.2 litre/sec 30cfm
Air pressure	80psi (5.6kg per sq cm)
Max. depth of cut	7/8" (22mm)

5" HEAVY DUTY TRIMMER

This new heavy duty air operated trimmer has been introduced for trimming the thicker GRP mouldings up to 1 3/8".

A side handle ensures good tool balance, and a safety lever throttle is fitted.

The side spoked diamond saw blade ensures adequate clearance when cutting thicker laminates, and assists in cutting curves without jamming.

A dust extractor head is available similar to those on our other trimmers.

Supplied with 5" x 1/16" (127mm x 1.55mm) spoked diamond blade, 15 feet (4.5 metres) of 1/2" (12.5mm) bore air hose and tools.

Order ref. AOO 16079

S P E C I F I C A T I O N

Speed	12500rpm
Weight	3.85lbs (1.74kg)
Air consumption	14.2 litre/sec 30cfm
Air pressure	80psi (5.6kg/cm ²)
Maximum depth of cut	1 3/8" (3.49cm)



CONVERSION KIT FOR MAKITA GRINDER

The conversion kit consists of a lightweight aluminium guard, an arbor and a 4" diameter diamond wheel with which moulders can convert a Makita 9501B grinder to a diamond wheel trimmer. Care must be taken to ensure that the motor is regularly blown clear of dust.

Order ref. AOO 16080

4" H.D.L.V. HEAVY DUTY DIAMOND WHEEL TRIMMER

The Downland 4" H.D.L.V. is a pneumatic, heavy duty, low vibration diamond wheel trimmer developed to meet the most stringent noise and vibration-level regulations.

It is a well balanced tool that is quieter, more comfortable to use but even more powerful than earlier models and will quickly and easily cut 12-15mm GRP laminates producing a clean smooth edge.



The wheel guard is fitted with a detachable dust cover and the guard also has a connection for a

vacuum hose coupling.



The Downland H.D.L.V. 4" Diamond Wheel Trimmer is a quiet-running, high quality tool that will give years of service.

Order ref. AA017769

S P E C I F I C A T I O N

Recommended wheel size	100 x 16 x 1.6mm (4" x 5/8" x 0.060")
Max free speed	12000 RPM
Overall length	257mm
Height	78mm
Weight	1.7kg
Max output	0.85 KW
Air inlet thread	3/8" NPT
Hose size	3/8" ID
Vacuum hose coupling	25MM
Average air consumption	28.3 CFM
Noise level (no load)	82Db(a)
Vibration level (no load)	2.2m/sec ²
Max air pressure	6 BAR, 85 PSI
Max depth of cut	22mm

HIGH SPEED PNEUMATIC ROUTERS

These tools are ideal for cutting radii, apertures and irregular shapes in GRP mouldings.

They are also very suitable for trimming offcuts from irregular mouldings, where they may be used either freehand or fitted with a dust collector hood/guide which will follow a template or jig to give accurate reproducibility of cut.

Both models are fitted with a rear exhaust which carries the used air away behind the operator.

Supplied complete with 15 feet of airhose and 4.8mm diamond burr.



Order ref. AAO 17517 27S

S P E C I F I C A T I O N

Free Speed	25000rpm
Air consumption	16 litre/sec 34cfm
Air pressure	80psi (5.7kg/cm ²)
Weight	0.7kg (25oz)
Overall length	205mm
Collet size	6mm
HP	0.55
Maximum burr diameter	16mm
Part No. for Dust Collector Hood/Guide	4353

Order ref. AAO 17511 17S

S P E C I F I C A T I O N

Free speed	38000rpm
Air consumption	10 litre/sec 21 cfm
Air pressure	80psi (5.7kg/cm ²)
Weight	0.4kg (14oz)
Overall length	170mm
Collet size	6mm
HP	0.34
Maximum burr diameter	9mm
Part No. for Dust Collector Hood/Guide	4079

MK 4 BENCH TRIMMER

The Downland Bench Trimmer is a powerful tool with an adjustable height pneumatic motor driving a 150mm diameter diamond wheel.

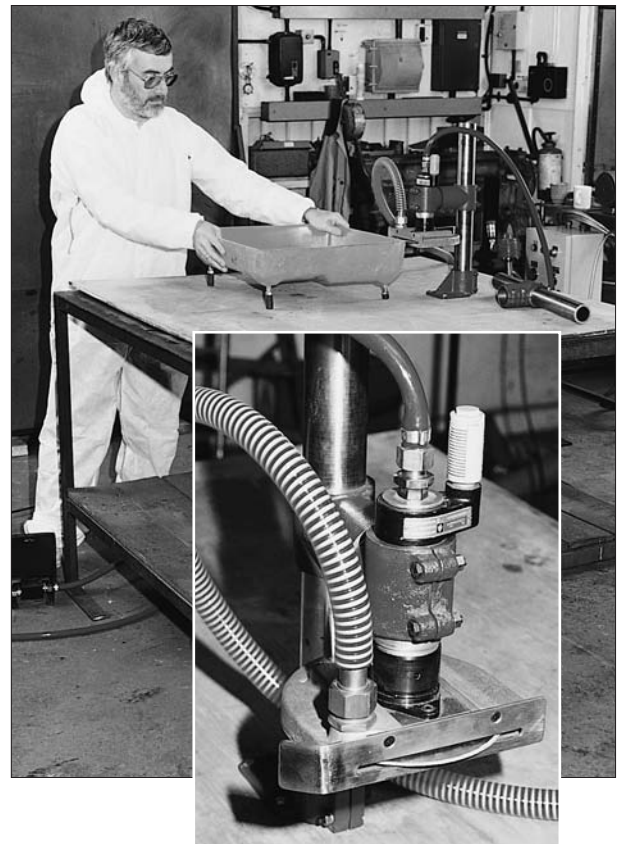
The wheel guard is spring loaded for safety and has a dust take-off point for easy connection to an extraction system. The operator controls the cutter by a safety foot switch.

The Downland Bench Trimmer is intended for trimming applications where large quantities of mouldings have to be trimmed to a consistent height in a single plane.

The moulding to be trimmed is placed in a fixture (a mould with 4 adjustable feet) and placed on a smooth surface where it can be passed across the horizontal diamond cutting wheel which must be preset to the desired height.

Bench trimming in this way will produce a perfectly straight cut and is considerably faster than following a line by hand.

Order ref. MK 4 AOO 15960



S P E C I F I C A T I O N

Maximum height of cut	482mm (19")
Minimum height of cut	57mm (2¼")
Amount of wheel protruding	27mm (1⅞")
Motor speed	3,300rpm
Air consumption	30 cfm 14.2 litre/sec
Wheel diameter	150mm (6")

ATLAS COPCO AIR TOOLS

We offer below a range of tools from Atlas Copco that we have selected as having particular relevance for the GRP industry.

The Atlas Copco tools are high quality, light, powerful and ergonomically designed with handles that optimise the transfer of high feed forces direct to the work piece and substantially reduce physical strain on the operator.

Noise and vibration levels are minimised and all machines produced by Atlas Copco bear the CE marking and conform to EU Machine Directive 98/37/EC, which focuses on safety.

We show a small selection but there are over 2000 tools in the Atlas Copco range. If you require light, high quality pneumatic tools please contact us.

LSO30 ORBITAL SANDER

The LSO30 is a powerful pneumatic orbital sander that can be used for dry sanding but is particularly suitable for rubbing down with wet and dry paper used wet. The pad size is suitable for 1/8th of a 280 x 230 mm sheet of abrasive paper.



Photo: Atlas Copco

Stock number: AAO21002

S P E C I F I C A T I O N	
Max free speed	7000rpm
Max output	0.3 kw
Weight	1.6 Kg
Height	125 mm
Length	210 mm
Pad size	93 x 170 mm
Air consumption	7.5 l/s (16 cfm)
Air inlet	1/4" BSP
Sound level-free speed	82 dB (A)

LSO31 ORBITAL SANDER WITH DUST EXTRACTOR

The LSO31 is a powerful, pneumatic, orbital sander with integral dust extraction that makes it ideal for dry sanding.

The pad size is suitable for 1/8 of a 280 x 230 mm sheet of abrasive paper.

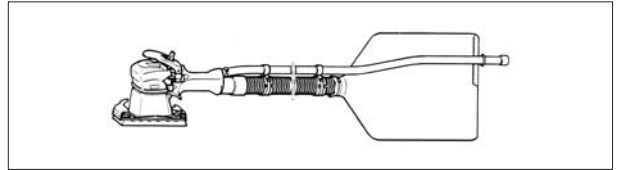


Photo: Atlas Copco

Stock number: AAO21001

S P E C I F I C A T I O N	
Max free speed	7000rpm
Max output	0.3 kw
Weight	1.6 Kg
Height	125 mm
Length	210 mm
Pad size	93 x 170 mm
Air consumption	7.5 l/s (16 cfm)
Air inlet	1/4" BSP
Sound level-free speed	82 dB (A)

LST30 RANDOM ORBITAL SANDER

The LST30 is a powerful pneumatic random orbital sander that due to its dual rotating/orbital action can produce a very good finish using fine wet and dry paper or with coarse paper can be used for initial flattening down. It has a 150mm diameter pad for self-stick paper.



Photo: Atlas Copco

Stock number: AAO21003

S P E C I F I C A T I O N	
Max free speed	9000rpm
Max output	0.3 kw
Weight	1.1 Kg
Height	120 mm
Length	175 mm
Pad size	150 mm diameter
Air consumption	7.5 l/s (16 cfm)
Air inlet	1/4" BSP
Sound level-free speed	80 dB (A)

LST31 RANDOM ORBITAL SANDER WITH DUST EXTRACTION

The LST31 is a powerful pneumatic random orbital sander with dust extraction that makes it ideal for dry sanding. It has a 150mm pad for self-stick.

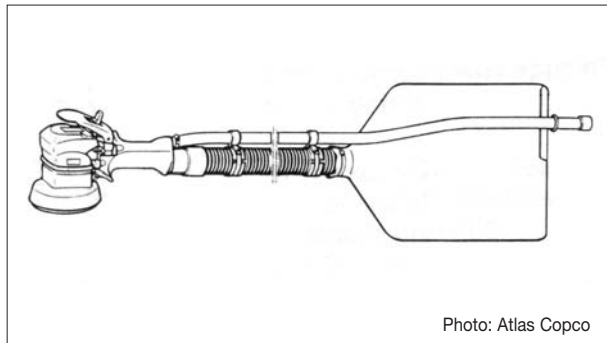


Photo: Atlas Copco

Stock number: AAO21004

S P E C I F I C A T I O N

Max free speed	9000rpm
Max output	0.3 kw
Weight	1.3 Kg
Height	120 mm
Length	200 mm
Pad size	150mm diameter
Air consumption	7.5 l/s (16 cfm)
Air inlet	¼" BSP
Sound level-free speed	82 dB (A)

LSV27 DISC SANDER

The LSV27 is a high speed, powerful pneumatic disc sander for rapid sanding or grinding of GRP, wood, paint or metal.



Photo: Atlas Copco

Stock number: AAO21006

S P E C I F I C A T I O N

Max free speed	6000rpm
Max output	0.62 kw
Weight	1.4 Kg
Height	87 mm
Length	260 mm
Pad size	180mm max
Air consumption	16 l/s (34 cfm)
Air inlet	¾" BSP
Sound level-free speed	73 dB (A)

LSV27/DE DISC SANDER

The LSV27/DE is a high speed pneumatic disc grinder that is well suited to the GRP industry due to the integral dust guard with a fibre bristle edge that will help to avoid scratching plastic surfaces. It requires coupling through a flexible hose to a vacuum source producing 250m³/hour.

Photo: Atlas Copco

Stock number: AAO21005

S P E C I F I C A T I O N

Max free speed	6000rpm
Max output	0.62 kw
Weight	1.6 Kg
Height	87 mm
Length	260 mm
Pad size	180mm max
Air consumption	16 l/s (34 cfm)
Air inlet	¾" BSP
Sound level-free speed	73 dB (A)

LSV27 POLISHER

The LSV polisher is a high torque, pneumatic sander that due to its low speed is suitable for polishing and buffing gel-coated surfaces. It is supplied complete with a 180mm backing pad and a lambswool bonnet but can also be fitted with a 150mm diameter foam mop for compounding with abrasives.



Photo: Atlas Copco

Stock number: AAO21007

S P E C I F I C A T I O N

Max free speed	2100rpm
Max output	0.55 kw
Weight	1.8 Kg
Height	87 mm
Length	280 mm
Pad size	180mm max
Air consumption	16 l/s (34 cfm)
Air inlet	¾" BSP
Sound level-free speed	74 dB (A)

A C C E S S O R I E S

180mm Lambswool Bonnet	Stock No. A0016601
150mm Foam Polishing Mop	StockNo. A0016311

ATLAS COPCO PISTOL-GRIP DRILLS

Atlas Copco pistol-grip drills are suitable for most drilling tasks in the GRP industry. They fit snugly in the hand and the anatomic design of the grip keeps the arm and wrist straight, reducing the risk of injury.

The high power-to-weight ratio means maximum stock removal in the shortest possible time. The chuck guard protects fingers, allowing a two-handed grip and comfortable guiding of the drilling operation.

ATLAS COPCO LBB24 HO60



The LBB24 HO60 has a 6.5mm chuck and is suitable for drilling 2.0-5.0mm holes in composites.

Photo: Atlas Copco

Stock number: AAO21009

S P E C I F I C A T I O N

Max free speed	6000rpm
Chuck capacity	6.5 mm
Weight	1.1 Kg
Air consumption	5.9 l/s (12.5 cfm)
Air inlet	1/4" BSP
Sound level-free speed	73 dB (A)
Maximum output	210 W

ATLAS COPCO LBB34 HO33



The LBB34 HO33 has a 10mm chuck and is suitable for drilling 2.0-4.0mm holes in mild steel and 5.0-10.0mm holes in composites.

Photo: Atlas Copco

Stock number: AAO21011

S P E C I F I C A T I O N

Max free speed	3300rpm
Chuck capacity	10 mm
Weight	1.1 Kg
Air consumption	9.5 l/s (20 cfm)
Air inlet	1/4" BSP
Sound level-free speed	77 dB (A)
Maximum output	400 W

ATLAS COPCO LBB36 HO13

The LBB36 HO13 has a 10mm chuck and is suitable for drilling 2.5-6.0mm holes in mild steel and 8.0-13.0mm holes in composites.

Stock number: AAO21008

Photo:
Atlas Copco



S P E C I F I C A T I O N

Max free speed	6000rpm
Chuck capacity	6.5 mm
Weight	1.1 Kg
Air consumption	5.9 l/s (12.5 cfm)
Air inlet	1/4" BSP
Sound level-free speed	73 dB (A)
Maximum output	210 W

ATLAS COPCO LBB45 HO17

The LBB45 HO17 has a 16mm chuck and is suitable for drilling 10.0-16.0mm holes in composites.

Stock number: AAO21010

Photo:
Atlas Copco



S P E C I F I C A T I O N

Max free speed	1700rpm
Chuck capacity	16 mm
Weight	4.2 Kg
Air consumption	10 l/s (21 cfm)
Air inlet	3/8" BSP
Sound level-free speed	85 dB (A)
Maximum output	700 W

SPIRAL HOSES – SPI



The durable, hard polyurethane, SPI elastic spiral hose is ideal for air tools used at varying distances from a fixed outlet and is easily stretched and retracts immediately when released.

When used with hand tools the self-storage principle ensures that the hose is kept off the floor and away from the operator. The hoses are available in two sizes.

S P E C I F I C A T I O N

Model	SP2 HR-S	SP13 HP-S
Inside diameter	8mm	11mm
Outside diameter	12mm	16mm
Max airflow	11 l/s	20l/s
Working range	Up to 4m	Up to 5.5m
Male thread size	1/4" BSP	3/8" BSP
Max spiral diameter	65mm	90mm

Stock numbers: AAO21012 AAO21013

VACUUM MACHINE

A robust, mobile vacuum machine which can be used as a dust collector with many of our cutting tools. The ASS 35 has a double dust filter system and a 35 litre capacity stainless steel dust collector. It is powered by a 1.125 watt, 1.5hp electric motor.

It is supplied complete with a 5 metre hose, round brush, crevice spout and a set of rubber hose diameter reducers.

Order ref. AAO 17903



CENGAR J. MODEL GLASSFIBRE SAW

A lightweight, versatile trimming tool for cutting glassfibre mouldings, sheet metal, wood etc.

Cuts at 10,000 strokes per minute at 80 - 100psi (5.7 - 7kg/cm²) air pressure.

Will cut complex profiles and will operate in confined spaces at any angle.

Order ref.

AAO 16055	Cengar Saw
AAO 16057	100 Narrow Blades
AAO 16060	100 Taper Blades
AAO 16061	1 Diamond Tipped Blade



BOSCH PNEUMATIC JIG SAW

The Bosch air operated Jig Saw is similar to the electric model, but is smaller and lighter, and in addition has the advantages of being safe to use under wet conditions, where water is used to prevent dust problems, and its speed may be varied by the use of an air pressure regulator. With the orbital movement the blade is not in contact with the material on the downward stroke, therefore allowing better chip ejection, and diminishing friction. A large variety of blades are available ex-stock for cutting most materials.

We recommend the use of a moisture trap and air lubricator, and with these the motor will give a long and satisfactory life. We are able to give full service facilities on both the electric and air models.

Order ref. AOO 16500



S P E C I F I C A T I O N

Air consumption	55psi (3.8kg/cm ²) (8.5cfm/24m ³ /min)
	85psi (6kg/cm ²) (12.4cfm/0.35m ³ /min)
Strokes per min	55psi (3.9kg/cm ²) 1300
	85psi (6kg/cm ²) 1800
Weight	41/2lb (2.5kg)

BOSCH JIGSAW BLADES

The following range of Bosch Jig Saw Blades are available from stock:

Order ref.	Packs of 5
AAO 16510	TB101B Wood, Plastics, Clean Cut.
AAO 16511	TB101D Wood, Plastics, Fast Clean Cut.
AAO 16512	T111C Wood Plastics, Coarse Cut
AAO 16516	T119A Plywood and Hardboard, GRP.
AAO 16517	T119B Plywood and Hardboard.
AAO 16520	T144D Hard and Soft Wood.
AAO 16522	T244D Hard and Soft Wood, Curved Cuts.
AAO 16518	T127D Aluminium and Asbestos Cement.
AAO 16523	T227D Aluminium, Curved Cuts.
AAO 16513	T118A Mild Steel, Non-Ferrous Metals, GRP.
AAO 16524	T218A Mild Steel, Curved Cuts.
AAO 16514	T118B Mild Steel, Non-Ferrous Metals.
AAO 16515	T118G Mild Steel, Non-Ferrous Metals.
AAO 16519	T130 Tungsten Carbide, Coarse. Pack 3.
AAO 16521	T150 Tungsten Carbide, Medium. Pack 3.
AAO 16066	Diamond Jig Saw Blade. Single.

SECTION 4

DIAMOND TIPPED CUTTING TOOLS

We stock and supply a range of diamond tipped cutting tools which have been proven over 35 years to be the best and most economical tools for cutting glassfibre reinforced mouldings. Our diamond tipped tools are of the highest quality and will give the longest life whilst remaining economically priced. All our diamond tools are produced using natural diamond electroplated onto top quality steel.

The illustrated tools represent our standard range, but we are always prepared to make special types and sizes to a customer's drawing, sketch or specification.

For cutting and machining GRP diamond tools are unbeatable, they have long life and are cool cutting, and usually cutting can be carried out dry.

Should the diamond grit become loaded with resin through cutting material which is not fully cured soaking in resin solvent (acetone) and brushing with a wire brush will restore the cutting surface.

DIAMOND TIPPED TWIST DRILL

A range of high-speed steel, diamond tipped twist drills for drilling glass fibre.

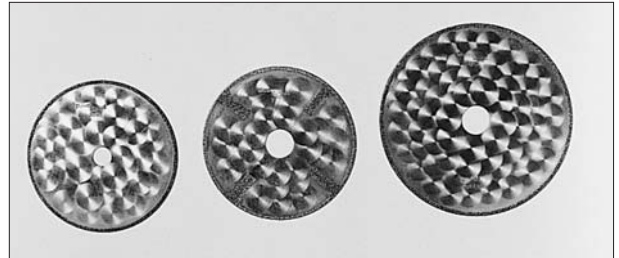


TWIST DRILLS 40 - 50 GRIT

Order ref.		
AOO 16156	1/8" dia.	AOO 16206 3mm
AOO 16157	3/16" dia.	AOO 16213 4mm
AOO 16158	1/4" dia.	AOO 16208 5mm
AOO 16159	5/16" dia.	AOO 16209 6mm
AOO 16160	3/8" dia.	AOO 16212 7mm
AOO 16161	7/16" dia.	AOO 16207 8mm
AOO 16162	1/2" dia.	AOO 16208 9mm
AOO 16210	5/8" dia.	AOO 16224 10mm
AOO 16211	3/4" dia.	AOO 16201 11mm
		AOO 16205 11.5mm
		AOO 16202 12mm
		AOO 16203 13mm
		AOO 16204 14mm

DIAMOND WHEELS 50-60 GRIT

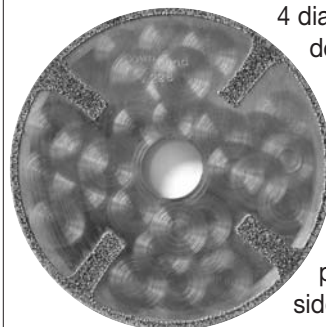
The Downland Standard range of diamond wheels are high quality cutting tools for glassfibre laminates and are produced by electroplating natural, 50-60 grit diamonds onto the perimeter of a steel disc. The diamond plating extends for 2-2.5mm down the side of the wheels to give cutting clearance and produce a clean chip-free cut on GRP mouldings including gel-coated laminates.



Order ref.	O.D.	x Bore	x Width
AOO 16119	37mm (1 1/2")	x 6.3mm (1/4")	x 1mm (.040")
AOO 16122	50mm (2")	x 19mm (3/4")	x 1mm (.040")
AOO 16124	50mm (2")	x 6.3mm (1/4")	x 1.5mm (.060")
AOO 16123	50mm (2")	x 19mm (3/4")	x 1.5mm (.060")
AOO 16126	50mm (2")	x 12.7mm (1/2")	x 1mm (.040")
AOO 16127	56mm (2 1/4")	x 19mm (3/4")	x 1mm (.040")
AOO 16128	56mm (2 1/4")	x 19mm (3/4")	x 1.5mm (.060")
AOO 16130	62mm (2 1/2")	x 6.3mm (1/4")	x 1.5mm (.060")
AOO 16131	62mm (2 1/2")	x 12mm	x 1mm (.040")
AOO 16132	62mm (2 1/2")	x 12.7mm (1/2")	x 1mm (.040")
AOO 16133	62mm (2 1/2")	x 12.7mm (1/2")	x 1.5mm (.060")
AOO 16135	62mm (2 1/2")	x 19mm (3/4")	x 1mm (.040")
AOO 16136	62mm (2 1/2")	x 19mm (3/4")	x 1.5mm (.060")
AOO 16140	75mm (3")	x 12mm	x 1.5mm (.060")
AOO 16137	75mm (3")	x 6.3mm (1/4")	x 1.5mm (.060")
AOO 16139	75mm (3")	x 12.7mm (1/2")	x 1.5mm (.060")
AOO 16141	75mm (3")	x 19mm (3/4")	x 1mm (.040")
AOO 16142	75mm (3")	x 19mm (3/4")	x 1.5mm (.060")
AOO 16144	75mm (3")	x 22.2mm (7/8")	x 1.5mm (.060")
AOO 16154	100mm (4")	x 12mm	x 1.5mm (.060")
AOO 16259	100mm (4")	x 6.3mm (1/4")	x 1.5mm (.060")
AOO 16145	100mm (4")	x 12.7mm (1/2")	x 1.5mm (.060")
AOO 16146	100mm (4")	x 15.9mm (5/8")	x 1.5mm (.060")
AOO 17779	100mm (4")	x 16mm (5/8")	x 1.5mm (.060")
AOO 16147	100mm (4")	x 19mm (3/4")	x 1.5mm (.060")
AOO 16155	100mm (4")	x 22mm	x 1.5mm (.060")
AOO 16164	100mm (4")	x 22.2mm (7/8")	x 1.5mm (.060")

DIAMOND WHEELS SPOKED 50-60 GRIT

Our spoked diamond wheels are similar to the standard wheels but have a series of 4 diamond spokes extending down both sides of the steel disc. The spokes give the extra clearance necessary for cutting thick laminates or for curved cuts but may chip gel-coated edges particularly on the convex side of the curved cut.

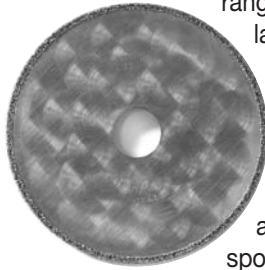


DIAMOND WHEELS – SPOKED 50-60 GRIT contd.

Order ref.	O.D.	x Bore	x Width
AOO 16125	50mm(2")	x 19mm (¾")	x 1mm (.040")
AOO 16138	75mm (3")	x 19mm (¾")	x 1.5mm (.060")
AOO 16167	100mm (4")	x 12.7mm (½")	x 1.5mm (.060")
AOO 16148	100mm (4")	x 15.9mm (⅝")	x 1.5mm (.060")
AOO 16149	100mm (4")	x 19mm (¾")	x 1.5mm (.060")
AOO 16225	100mm (4")	x 22mm	x 1.5mm (.060")

DIAMOND WHEELS, QUICK CUT

We offer a small range of diamond wheels with 40-50 grit diamonds that have larger grit than the standard range and are designed to cut thick laminates as quickly as possible. Inevitably due to the larger grit there may be a degree of edge chipping on gel-coated surfaces.



The quick-cut wheels are available in spoked and non-spoked form.

Order ref.	O.D.	x Bore	x Width
AOO 16116	50mm (2")	x 19mm (¾")	x 1mm (.040")
AOO 16117	75mm (3")	x 19mm (¾")	x 1.5mm (.060")
AOO 16118	100mm (4")	x 19mm (¾")	x 1.5mm (.060")
AOO 16275	127mm (5")	x 15.9mm (⅝")	x 1.5mm (.060")
AOO 16151	127mm (5")	x 19mm (¾")	x 1.5mm (.060")
AOO 16152	127mm (5")	x 19mm (¾")	x 1.5mm (.060")
AOO 16153	152mm (6")	x 19mm (¾")	x 1.5mm (.060")
AOO 16166	152mm (6")	x 19mm (¾")	x 15.mm (.060")
AOO 16165	178mm (7")	x 127mm (½")	x 1.5mm (.060")

WHEEL ARBOR



The wheel arbor is a holding device to enable small diameter wheels to be fitted to a router or drill with a 3-jaw or collet chuck.

The wheel arbor is available with either ¼" or 6mm shank and is intended for use with a 2" x ¾" x 0.060 (50 x 19 x 1.6mm) wheel.

Please note that safety glasses and gloves should always be worn when using unguarded wheels.

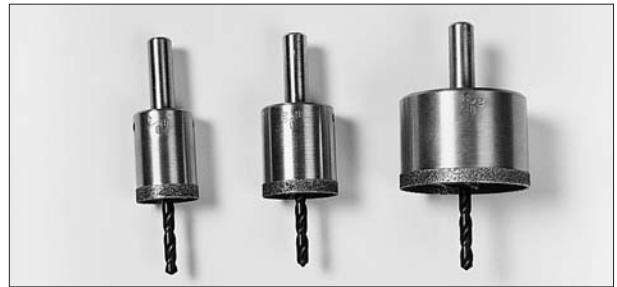
Order ref.	Description
POOO 1701	Wheel arbor with ¼" shank
POOO 5717	Wheel arbor with 6mm shank

DIAMOND TIPPED HOLESAWS

Downland diamond tipped holesaws will quickly and easily cut accurately sized holes in glassfibre mouldings. They are made in one piece with integral shank to give maximum accuracy and are fitted with a high-carbon steel twist drill to give easy hole positioning.

The sizes including and above 12mm (½") have spring ejectors to expel the cutout disc while the smaller sizes have slots to enable the cutouts to be cleared with a screwdriver point.

The sizes including and above 25mm (1") have 6mm (¼") pilot drills while smaller sizes have 5mm (⅜") pilot drills.



IMPERIAL

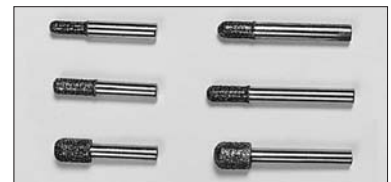
Stock No.	Description	Stock No.	Desc.	Stock No.	Desc.
AOO 16068	⅜" dia	AOO 16098	⅞" dia	AOO 16107	2¼" dia
AOO 16081	⅝" dia	AOO 16099	1" dia	AOO 16108	2½" dia
AOO 16067	⅝" dia	AOO 16100	1¼" dia	AOO 16109	2¾" dia
AOO 16095	½" dia	AOO 16101	1⅜" dia	AOO 16110	3" dia
AOO 16094	⅝" dia	AOO 16103	1½" dia	AOO 16111	3¼" dia
AOO 16072	¾" dia	AOO 16104	1¾" dia	AOO 16112	3½" dia
AOO 16215	1⅞" dia	AOO 16105	1⅞" dia	AOO 16113	4" dia
AOO 16097	¾" dia	AOO 16106	2" dia	AOO 16115	4½" dia

METRIC

Stock No.	Description	Stock No.	Description	Stock No.	Description
AAO 17509	9.5mm dia	AOO 16269	26mm dia	AOO 16250	55mm dia
AOO 17510	10.0mm dia	AOO 16270	27mm dia	AOO 16251	60mm dia
AOO 16226	11.5mm dia	AOO 16271	28mm dia	AOO 16222	64mm dia
AOO 16227	12mm dia	AOO 16272	29mm dia	AOO 16252	65mm dia
AOO 16096	13mm dia	AOO 16245	30mm dia	AOO 16253	70mm dia
AOO 16260	14mm dia	AOO 16217	32mm dia	AOO 16254	75mm dia
AOO 16242	15mm dia	AOO 16102	34mm dia	AOO 16255	80mm dia
AOO 16261	16mm dia	AOO 16246	35mm dia	AOO 16223	86mm dia
AOO 16262	17mm dia	AOO 16218	38mm dia	AOO 16256	90mm dia
AOO 16263	18mm dia	AOO 16247	40mm dia	AOO 16257	100mm dia
AOO 16264	19mm dia	AOO 16114	43mm dia	AOO 16258	115mm dia
AOO 16243	20mm dia	AOO 16219	44mm dia	AOO 16273	125mm dia
AOO 16265	21mm dia	AOO 16248	45mm dia	AOO 16276	150mm dia
AOO 16266	22mm dia	AOO 16228	48mm dia	AOO 16290	165mm dia
AOO 16267	23mm dia	AOO 16249	50mm dia	AOO 16291	175mm dia
AOO 16268	24mm dia	AOO 16220	51mm dia		
AOO 16244	25mm dia	AOO 16221	53mm dia		

DIAMOND BURRS 40-50 GRIT

Diamond Burrs are for use in high-speed routers with a minimum speed of 25,000 RPM for best results.



STOCK SIZES

Order ref.	Shank		Diamond	
	Diameter	Length	Diameter	Length
<i>Imperial</i>				
AOO 16082	¼"	1"	⅜"	½"
AOO 16086	¼"	1½"	⅜"	½"
AOO 16085	¼"	1"	¼"	½"
AOO 16089	¼"	1½"	¼"	½"
AOO 16092	¼"	1½"	⅜"	7/8"
<i>Metric</i>				
AOO 16084	6mm	25mm	4.8mm	12mm
AOO 16088	6mm	37mm	4.8mm	12mm
AOO 16083	6mm	25mm	6mm	12mm
AOO 16090	6mm	37mm	6mm	12mm
AOO 16092	6mm	25mm	9mm	12mm
AOO 16093	6mm	37mm	10mm	12mm
AOO 16065	6mm	37mm	5-1mm tapered	16mm
AOO 16069	6mm	37mm	6-5mm tapered	14mm

SECTION 5

HEALTH & SAFETY IN THE WORKSHOP

SAFETY CONTAINERS FOR ACETONE AND OTHER FLAMMABLE SOLVENTS

The use of acetone and other solvents in the G.R.P. industry presents a very real fire hazard, and has without doubt been the cause, or contributed to many serious moulding shop fires.

The following range of containers and tanks have been specifically designed to meet the requirements of the Factories Acts relating to Highly Flammable Liquids.

SAFETY ACETONE DRUM TAP

The self closing drum tap is designed for the safe dispensing of flammable liquids from 45 - 50 gallon (200 lt) drums ($\frac{3}{4}$ " B.S.P. thread). A sturdy spring within the body ensures tight closure on the Teflon valve seat at all times.

Design permits the use of a security padlock when necessary.

Heavily cast aluminium body and corrosion resistant steel. Teflon valve seat easily replaceable.

Order ref. AAO 17558



TREADLE OPERATED DIP TANK

This unit can be sited centrally in the G.R.P. shop and will serve several operators for cleaning brushes and rollers.

The hinged cover is self closing and therefore protects the cleaning solvents from fire risk or contamination and at the same time minimises evaporation when the tank is not in use. In the event of accidental ignition of the flammable solvent whilst cleaning is taking place, the operator simply removes his foot from the treadle bar when the cover will drop and snuff out the fire.

It is possible to stand up to four one-gallon polythene buckets in the container for use when different colours are being used.

Use of the equipment is simplicity itself, the operator places a foot on the treadle bar and carries out the necessary cleaning operation, using both hands if necessary. Removal of the foot closes the cover.

A rack is fitted internally for the storage of brushes and rollers. Drain plug fitted in bottom of tank.

Order ref. AAO 17555

S P E C I F I C A T I O N

Size 42" x 24" x 38" (1067mm x 609mm x 965mm)

Tank size 30" x 9" x 13" deep (762mm x 228mm x 330mm)

Solvent content 3 gallons = 3" deep (13.6lt = 75mm)



SAFETY/STORAGE DISPENSING CANS

A completely new low cost approach to the requirements of the Factories Act 1961 (Highly Flammable Liquids and L.P.G. Regulations 1972).

For conveying and dispensing: Solvents, thinners and petroleum mixtures.

Heavy gauge tinplate containers, all seams soldered.

Flame arrester protected with Safety Pourer.

Stabilised flow.

Labelled to conform with regulations.

Design fire tested for safety.

Suitable for all solvents and mixtures excepting corrosives. Not suitable for catalysts.

Order ref. AAO 17568 P1 5 litre

Order ref. AAO 17565 P3 15 litre



SAFETY DIP CANS

These cans have been designed for use with highly flammable liquids such as acetone, and are ideal for use by individual operators for cleaning brushes and rollers.

Should the contents ignite, the lid will instantly close at 57°C putting the fire out, and containing any toxic vapours.

The solvent should never be allowed over the MAX LEVEL line. Made of heavy gauge tin plate, and fitted with carrying handle.

To comply with health and safety inspectorate requirements safety dip cans are supplied complete with a mounting ring which must be screwed to the workbench to obviate any possibility of the can being knocked over.

Available in the following sizes:

Order ref.

AAO 17550 22/7 Dip Tank 4.85 litre Ht. x dia. 260 x 178

AAO 17551 22/9 Dip Tank 8.00 litre Ht. x dia. 260 x 240

AAO 17552 23/9 Dip Tank 12.85 litre Ht. x dia. 370 x 240

AAO 17553 24/11 Dip Tank 14.45 litre Ht. x dia. 302 x 284



SAFETY PLUNGER CANS 41-42

Designed to dispense measured and controlled amounts of flammable liquid onto a swab or cloth in a one-handed movement leaving the other hand free. By pressing down on the dasher plate, a measured film of fluid is delivered and as the spring loaded plate rises up again any excess fluid drains back into the canister. When in use, the dasher plate itself acts as a flame arrestor and when filling, the filler hole is again protected by a flame arrestor, both features removing the possibility of ignition and reducing the escape of vapours.

Order Ref.	Model	Dasher Size dia mm	Capacity Litres	Overall Size (mm) Ht. Dia.
AA017548	41	160	2.5	245 x 180
AA017549	42	160	5.0	245 x 240

DRAGER MULTI-GAS DETECTOR

The Drager Detector is a hand-held instrument for measuring the fumes in the atmosphere in working areas.

Under the Health and Safety at Work Act maximum levels of contamination are laid down, and it is the responsibility of the management to ensure that these are not exceeded.

The Drager Detector is the easiest, and most accurate method of measuring fume levels, and consists of a bellows unit which draws a measured quantity of air through the sampling tube, the contents of the tube changing colour according to the degree of contamination.

We stock tubes as shown below with many others to order.

Order ref. AOO 16326



Tubes for above

Order ref.		
AOO 16169	Drager Test Tubes Acetone	Pack of 10
AOO 16170	Drager 10B Styrene Test Tubes	Pack of 10
AOO 16320	Drager Test Tubes Formaldehyde	Pack of 10
AOO 16321	Drager Test Tubes Toluene 5A	Pack of 10
AOO 16322	Drager Test Tubes Methylene Chloride 100 A	Pack of 10
AOO 16323	Drager Test Tubes Trichloroethene 50A	Pack of 10
AOO 16324	Drager Test Tubes N-Hexane 100A	Pack of 10
AOO 16325	Drager Test Tubes Methanol 50A	Pack of 10
AOO 16172	Drager Test Tubes Methylacrylate	Pack of 10
AOO 16328	Drager Test Tubes O-Xylene	Pack of 10
AOO 16329	Drager Test Tubes Airflow	Pack of 10

PROTECTIVE DISPOSABLE CLOTHING

These garments are ideal for use in the G.R.P. moulding shop for protection against resins and glassfibres, and with reasonable use will last many weeks, and in addition the garments will give good protection against dust in trimming shops.

Made from a lightweight woven plastic material which is resistant to solvents. They may be washed many times.

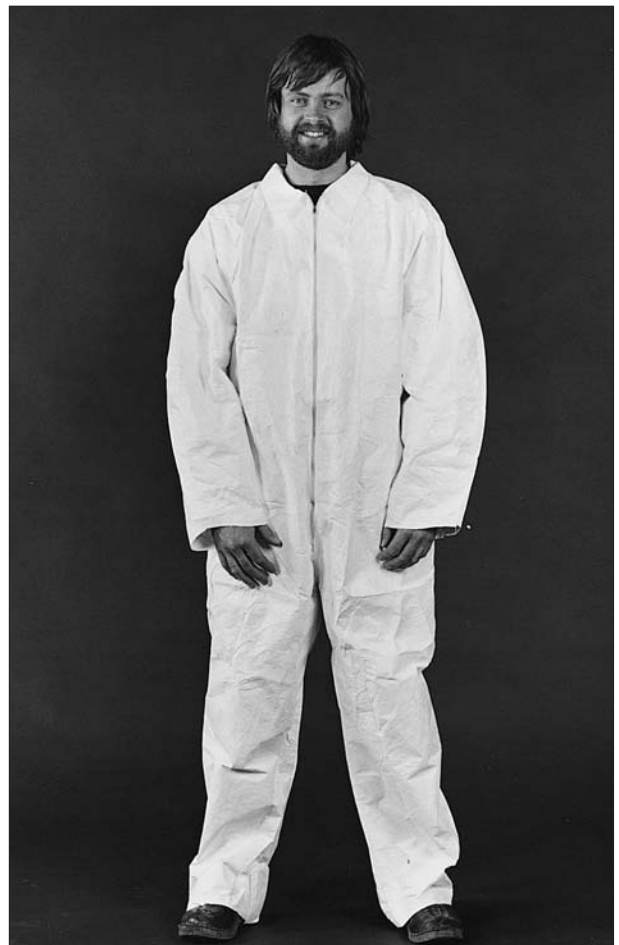
Owing to the lightweight porous structure of the material the garments are cool, and pleasant to wear, and yet will not allow penetration of glassfibre.

OVERALLS

Full zip fronted in medium, large and extra large sizes.

Order ref.

AAO 17204	Medium with hood
AAO 17205	Large with hood
AAO 17206	Extra large with hood



OVERBOOTS

Moisture impervious material, to be worn over conventional footwear. One size only.

Order ref. AAO 17203



HOODS

Elasticated face aperture and extended front and back panels. One size only.

Order ref. AAO 17201



EXCLUDER GOGGLES

The frames of these protectors are made from soft PVC and may be worn comfortably over prescription spectacles. Conform to BS 2092

Order ref. AAO 16238



APRONS

White Neoprene bib aprons with four eyelets. Size 36" (914mm) x 42" (1067mm). Ideal for moulding shop use as they are not affected by resin or solvents.

Order ref. AAO 15840 Neoprene

Polythene bib aprons 30" (762mm) x 42" (1067mm). In packs of 100. Durable enough to re-use but cheap enough to discard.

Order ref. AAO 15841 Polythene



LIGHTWEIGHT EYE SHIELDS MODEL BS71

Unrestricted vision with all round impact protection. Light and comfortable to wear.

Order ref. AOO 16235



GLOVES

Polythene - A very lightweight, disposable polythene glove, ideal for protection against light dust and dirt. Sold in packs of 100 gloves.

Order ref. AAO 16435

Black Rubber - A medium weight rubber glove with good resistance to the commonly encountered laminating materials. Sold in packs of one dozen pairs.

Order ref.
AAO 16437 Large AAO 16436 Extra Large

Supaweight Rubber - A heavy duty orange rubber glove offering the best possible resistance to the commonly encountered glassfibre materials. Sold in packs of one dozen pairs in large and medium sizes.

Order ref.
AAO 16438 Medium AAO 16439 Large

Heavy Duty PVC - A heavy duty glove ideal for rough work. Resistant to all chemicals commonly used in the G.R.P. industry. Supplied in single pairs. Large size only in either 10½" or 16" lengths.

Order ref.
AAO 16446 10½" AAO 16444 16"

Canadian Rigger - A heavy duty leather glove with pliable cloth backing ideal for handling untrimmed glassfibre mouldings. Supplied in single pairs, large size only.

Order ref. AOO 16447

Conform+ - A lightweight disposable latex rubber glove supplied ready powdered for easy fitting. Sold in packs of 100 large size (9-10").

Order ref. AAO 16443

EYEWASH STATION

The Health and Safety Regulations Booklet HS(R) 11 states:

"Where tap water is not available, sterile water or sterile normal saline, in disposable containers each holding at least 300ml should be kept easily accessible, and near to the First Aid Box, for eye irrigation.

At least the following quantities should be provided".

Employees	Sterile Eye Wash
1 - 10	1 Bottle
11 - 50	3 Bottles
51 - 100	6 Bottles

Eye Wash Board - 1381

The rigid PVC board of 2.5mm thickness is drilled in each corner for wall-fixing and holds a 500ml bottle of sterile eye wash (sodium chloride 0.9%) in a metal clip.

The board has printed illustrations of the application for eye irrigation.

A spare bottle of eye wash is also included.

Size of board 30cm x 40cm.

Order ref. AOO 16240

Order ref. AOO 16241 Replacement bottles for above

Eye Wash

TWIST OFF
Twist off cap to break seal. Do not pull.

IRRIGATE
Gently squeeze bottle allowing eye wash to flow freely across eye.

THROW AWAY
Throw away bottle after use

CLAYTON
FIRST AID EQUIPMENT
Sterile Eye Wash
0.9% Sodium Chloride Ph. 8.0
IRRIGATE EYE ONLY!
DO NOT USE FOR ANY OTHER PURPOSE. DO NOT USE FOR ANY OTHER PURPOSE. DO NOT USE FOR ANY OTHER PURPOSE.
MADE IN
ENGLAND
Manufactured by Clayton
A & Clayton Limited, London
1978/143

EAR DEFENDERS

A lightweight general purpose ear defender with foam filled cushioned ear seats, for high noise attenuation and durability.

Order ref. AOO 16230



LIGHTWEIGHT STANDARD DUST MASKS

A lightweight, hygienic mask designed for protection against nuisance dust and other non-toxic irritants.

Order ref. AOO 16712

Order ref. AOO 16715 Refill (Pack 25)



PARTICLE MASKS

Comfortable - stands away from face, lightweight and cool.

High filtration efficiency. Hygienic and disposable.
Easy to speak through.

Order ref. AOO 16710



3M™ 7500 SERIES RESPIRATOR

The 3M 7500 Fume Respirator is a half mask respirator which combines comfort, reliable protection and durability. It is easy to use and comfortable with a textured face seal.

3M™ Half Facepiece Respirator 7500, Ultimate Reusable

- Valve design helps make breathing easier, and helps reduce heat and moisture buildup in facepiece.
- Advanced silicone material provides a softer feel on the face.
- Unique head harness design adjusts easily and user has the option of wearing the respirator in either traditional or drop-down mode.

The half-mask meets the European Standard EN 140 Gas and vapour filters meet EN 141 and particulate filters meet EN 143.



1 x 7500 Half Mask with 2 x Fume Cartridges
Stock No. AAO17241

1 x Pair Replacement Fume Cartridges
Stock No. AAO17247

3M™ 7500 DUST RESPIRATOR

The 3M 7500 Dust Respirator is based on the same facepiece as the Fume Respirator with the same degree of comfort but is fitted with particulate filters that meet EN143.

1 x 7500 Half Mask with 2 x Dust Cartridges
Stock No. AAO17242

1 x Pair Replacement Dust Cartridges
Stock No. AAO17248

8835 PREMIUM DUST/MIST/FUME RESPIRATOR

The 8835 has been designed to provide effective, hygienic and exceptionally comfortable respiratory protection to FFP3 Solid and Liquid as defined by TM14 Part 9.1 European Standards.

It is suitable for use against many potentially lung damaging dusts, mists and fumes including:

Asbestos and lead dust
Spray mists (excluding paint spray)
Metal fumes

The 8835 is the first maintenance-free respirator available in two face piece sizes.

Supplied in packs of 5.

Order ref. AAO 17345



⚠ WARNING

These respirators help reduce exposure to certain airborne contaminants. Misuse may result in sickness or death. Before use, the wearer must read and understand User Instructions provided as part of product packaging. Time use limitations may apply. For proper use, see supervisor, packaging or call 3M OH&ESD Technical Service, call 1-800-243-4630. In Canada, call 1-800-267-4414 or 1-800-265-1840, ext. 6137.

AIRSHIELD VISOR

The Airshield Visor has been designed and manufactured specifically to provide lung and eye protection during resin and paint spraying including applications where isocyanates are used. The Airshield Visor combines the ultimate in safety technology with the highest standards of wearer comfort.

Operating off a standard industrial compressed air supply the lightweight Airshield Visor utilises a belt-mounted air valve to provide a controlled and adjustable air supply.

The belt valve can be coupled direct to a compressed air supply, but for completely odour free air a triple filtration unit should be used which will meet B.S.4275/1974.

The triple filter consists of a free standing frame supporting a centrifugal prefilter, an oil removing coalescing filter and an activated charcoal filter which will remove any unpleasant smells from the air.

The triple filter has a twin instant air connector and is suitable for one or two man operation.

Order ref.

AOO 15793	Airshield Visor complete
AOO 15799	Spare Visor
AOO 15797	Spare Visor Covers Pack of 10
AOO 15798	Triple Filter



BARRIER POWDER

For the prevention of irritation due to handling glassfibre mats. First apply barrier cream and then lightly dust the powder on.

Supplied in 55 gm puffer packs for individual use.

Order ref. AOO 16462

DOWNLAND RESINKLEEN

The Hand Cleaner specially formulated for the G.R.P. industry.

Resinkleen is a truly hardworking hand cleanser and it has the added benefit of Lanolin, leaving the hands smooth and soft. Resinkleen quickly removes polyester and similar resins, also oil and grease safely and comfortably. Resinkleen contains no abrasives and rinses clean off with water, leaving no potentially harmful residue on the hands.

Applied to the contaminated hands, Resinkleen quickly dissolves the contaminant which can then be completely rinsed off with water. Safer too, Resinkleen eliminates the use of thinners, which, as well as being inflammable, can also damage the skin. Resinkleen is efficient, economical, has a pleasant smell and does not deteriorate in storage.

Supplied in 5 litre containers.

Order ref.

ABO 16468 5 Litre Bucket



DEB PROTEKS DRY BARRIER CREAM

A pre-work cream to help protect the skin against non-water based soilings such as dry powders, oils, greases, solvents and resins. Supplied in 2.5L buckets.

Order ref. AOO 16461

DISPENSERS

Model 1001/1

Dispenser for Rozalex Multiguard barrier creams, 2 litre capacity in silver hammer finish, complete with wall fixing screws and plugs.



Order ref. AOO 16467

MAXI PAPER WIPERS

Maxi Paper Wipers are a clean, convenient and hygienic replacement for waste rags. They are made from pure wool pulp to a high specification which provides maximum absorbency with good wet strength. Each roll is 23cms wide x 400 m long and should provide sufficient paper for one worker for 2-3 months.



Order ref.
AOO 16557 2 Roll Carton
AOO 16558 Floor Stand

SECTION 6

MATERIALS HANDLING

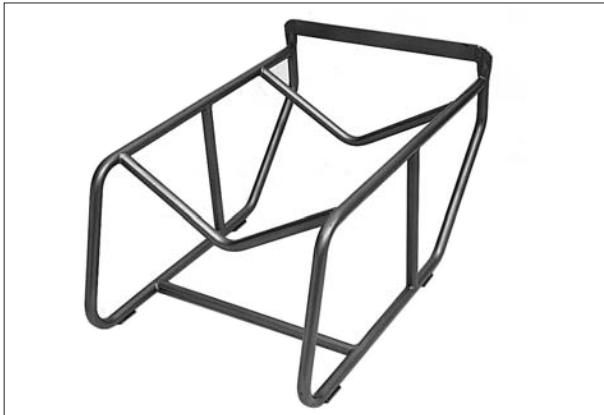
DRUM STANDS AND TROLLEYS

Of strong all welded tubular steel construction these drum stands and trolleys enable one man to handle drums of 40 - 50 gallon (200ltr.) size cleanly, easily and safely. They form compact storage units and occupy little floor space. Waste and spillage on the floors is kept to a minimum and fire risks, untidy premises and strain on operators are obviated.

Type No. T24

Designed as a static storage unit for use where drums do not have to be moved, and weighing only 17lb (7.7kg) this unit can easily be carried from place to place.

The base of the unit is fitted with steel shoes to prevent wear of the frame.



Order ref. AOO 16180

S P E C I F I C A T I O N

Overall length	34" (863mm)
Overall width	23½" (596mm)
Overall height	13½" (342mm)
Height of drum tap	13" (330mm)

Type No. T24A

Similar to Type No. T24, but fitted with four 4" fixed dia. cast iron wheels on 1" solid steel axles. This trolley is ideal where drums are only moved short distances and where occasional turns can be effected satisfactorily by "skidding" the rear wheels sideways on smooth concrete floors.



Order ref. AOO 16181

S P E C I F I C A T I O N

Overall length	34" (863mm)
Overall width	23½" (596mm)
Overall height	15¼" (393mm)

Type No. T24B

This model has 2 x 4" fixed wheels and 2 x castors to make moving and steering as easy as possible.



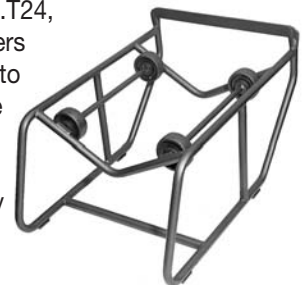
Order ref. AOO 16188

S P E C I F I C A T I O N

Overall length	34" (863mm)
Overall width	23½" (596mm)
Overall height	13½" (342mm)

Type No. T24C

Identical with Type No. T24, but fitted with top rollers which allow the drum to be rotated easily while in position on the cradle for drainage and discharging heavy liquids quickly from the side bung.



Order ref. AOO 16182

S P E C I F I C A T I O N

Overall length	34" (863mm)
Overall width	23½" (596mm)
Overall height	13½" (342mm)
Height of drum tap	13" (330mm)

DRUM HANDLER T33

The drum handler is a very simple and convenient method of transporting 40 - 50 gallon drums and is easily operated by one man.

The unit is mounted on large diameter cushion tyres for easy traverse of uneven ground.

Order ref. AOO 16183

S P E C I F I C A T I O N

Handle height (vertical)	63" (1600mm)
Overall width	24" - 32" (610 - 820mm)
Weight, approx.	56 - 63lb (25 - 28kg)
Wheels, pneumatic	16" x 4" (400 x 100mm)



DRUM LIFTER

A handy tool which will enable one man to raise or lower a 45 gallon (225kg) barrel without undue effort.

Order ref. AOO 16184



BUNG REMOVER

A handy tool for removing the 2" or 3/4" bung in 45 gallon (225kg) barrels. 21" (533mm) long for easy leverage. Manufactured from heavy gauge steel tube.

Order ref. AOO16185



ACETONE TAPS

Order ref.

AOO 15676 3/4" B.S.P. plastic.

AOO 15675 3/4" B.S.P. brass with locking lever
for padlock.



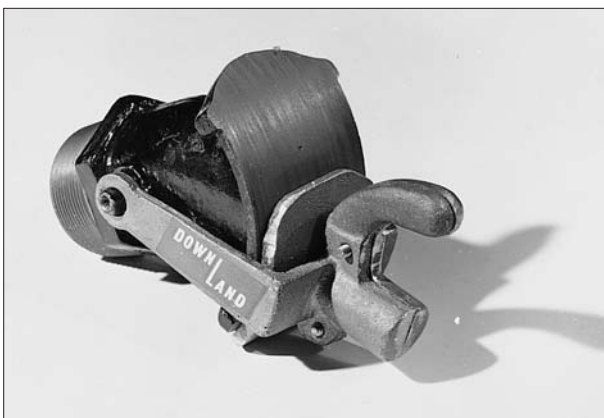
RESIN TAPS

These large aperture, non-drip resin taps have been proven over many years to be the ideal tap for dispensing polyester resin from 200L drums. The sliding plate principle gives good control of resin flow and can be adjusted infinitely from a dribble to a full-bore flow.

2" B.S.P. to fit large hold in 45 gallon (204.5ltr.) drum.
Cast iron with gun metal slide.

Order ref.

AAO 17326 2" B.S.P. Resin Tap.



IBC TANK HEATER



To achieve the correct viscosity and therefore best handling characteristics of polyester resin it should be warmed to a temperature of 20-25°C.

The IBC heating jacket is a polyurethane coated nylon outer jacket fitted with adjustable retaining straps and quick release polyurethane clips. A high thermal efficiency layer of insulation is held in place between the outer cover and the inner element carrier.

Order ref. A0016476

S P E C I F I C A T I O N

Jacket material	Nylon base fabric. Hydrolysis resistant, polyurethane coated polyamide substrate with fluorocarbon finish.
Jacket dimension	950mm height Adjustable between 4160-4310mm on circumference
Control	Adjustable thermostat -5 to 40°C
Power cable	5 metres, 2 x 1mm, PVC insulated, sheathed, galvanized steel wire braided
Electrical insulation	Double insulated
Voltage:	Standard 240v, 2 x 1kw circuits

DRUM HEATING JACKET



The heating jacket is adjustable and suitable for plastic and steel 200L drums.

Order ref. A0016475

S P E C I F I C A T I O N

Jacket material	Nylon base fabric. Hydrolysis resistant, polyurethane coated polyamide substrate with fluorocarbon finish.
Jacket dimension	440mm height x 1800-1950mm on circumference
Control	Adjustable or fixed-temperature thermostat
Power cable	5 metres, 2 x 1mm, PVC insulated, sheathed, galvanized steel wire braided
Electrical insulation	Double insulated
Voltage:	Standard 240v, 450 watts

The IBC Heating Jackets and Drum Heating Jackets are not suitable for hazardous Zone 1 and Zone 2 areas. For resin heating in hazardous areas we recommend the Thermosafe Heater.

THERMOSAFE DRUMHEATER

The Thermosafe Drumheater is versatile, simple, efficient, economical and totally safe even in resin storage and processing areas. It operates on the induction heating method and has been specifically designed for use in potentially explosive atmospheres. The Thermosafe produces uniform heating of drum walls and will raise the temperature of a typical 230kg drum of laminating resin from 10°C to 25°C in approximately 1 hour.

Order ref. AOO 16179



S P E C I F I C A T I O N

Overall diameter	74.3cm (29¼")
Height	71.1cm (28")
Weight	43.0kg (95lb)

ELECTRICAL SUPPLY

Single phase 240 volts, 50Hz A.C.

Class II Appliance. Do not earth.

BASEEFA Certification No. Ex 86B3044X.

EEx II 170°C (T3). (Zones 1 & 2)

SECTION 7

POLYESTER RESINS, CATALYSTS, ACCELERATORS, PIGMENTS AND METALLIC JEWELS

POLYESTER RESINS GENERAL SAFETY DATA

The advice given in this safety data sheet covers all grades of polyester resins which are solutions in styrene monomer. Most of these grades have the warning "Flash point in the range of 22°C - 32°C" on the container. A very few (currently two) special grades also contain some methyl methacrylate monomer. These grades have the warning "Highly Flammable" on the container. The advice covers both types of resin.

There are also a few (currently two) grades which do not contain any monomer. These are of high flash point (low fire hazard) and are referred to in a separate data sheet "SOLVENT FREE RESINS". These resins have no fire hazard warning on the container.

Section 1. Supplier's Details

Product: Polyester resins which are solutions in styrene with or without other monomers.

Suppliers: K & C Mouldings (England) Limited,
Spa House, Shelfanger,
Diss Norfolk IP22 2DF
Telephone No:Diss (01379) 642660

Product Description:

Solution of unsaturated polyester resin in styrene with or without other monomers.

Section 2. Nature of Hazards and Precautions

A. Fire Hazard

Polyester resins are flammable and have a flash point (Abel closed cup of approximately 32°C) (90°F) if containing only styrene monomer. Resins containing some methyl methacrylate monomer have lower flash points dependent upon the methyl methacrylate content. The requirements of the Highly Flammable and Liquefied Petroleum Gases Regulations Act 1972 apply. In particular:

i) Polyester resins must not be exposed to heat or sources of ignition.

ii) Smoking must be prohibited in areas where polyester resins are handled.

iii) Spillages must be cleaned up promptly and any resin contaminated material used for cleaning disposed of in an approved manner. (See Section 6).

iv) Adequate ventilation, particularly of curing ovens must be provided.

The advice of the Factory Inspectorate and Fire Officer should be obtained.

B. Toxic Hazards

i) SWALLOWING

Polyester resins do not have high oral toxicity. Every effort should be made to avoid accidental ingestion, as with all chemical products.

ii) SKIN CONTACT

Polyester resins can cause dermatitis. This is probably due to the styrene dissolving the skin's natural protective grease. Susceptibility varies between individuals. Working processes should not normally allow the resin to come into contact with operators' hands, and then the careful use of barrier cream before commencing work and skin cleansing cream after work provides adequate protection. If operators' hands are likely to come in contact with resin then gloves should be worn in addition to using the creams. In addition to particular protection to the hands, general protection with aprons or overalls should be provided and used. If there is any possibility of resin entering the eyes, goggles should be worn. The resin is irritating to the eyes and contact will be painful.

iii) INHALATION

Polyester resins give off styrene monomer. This monomer is toxic and inhaling it can cause giddiness and sickness at low concentrations, and at high concentrations can be fatal. The maximum allowable concentration is 100 ppm. Equipment to measure the styrene content of air, normally by the colour change of a detector tube, is available.

The styrene concentration in the air must be controlled by adequate ventilation. Ventilation is particularly important in curing ovens, where high concentrations of styrene vapour can accumulate. Ovens exceeding 1.5m³ (approx. 50 cu. ft.) must have mechanical ventilation with external motors and fire resisting ducts.

Section 3. Emergency Action

This can be a misleading description. Think of a small fire as a large fire in its early stages. Quick effective action is required, and for this dry powder or foam extinguishers are required, which must be provided in adequate numbers in suitable locations with trained personnel. The Fire Officer will be glad to give excellent advice. Always call the Fire Brigade. Water or soda-acid extinguishers tend to spread small areas of burning resin and are not recommended.

ii) LARGE FIRES

If a large fire should develop it must usually be dealt with by the Fire Brigade, and the Factory concentrate on orderly evacuation, so avoiding any danger to life. Consider the installation of an automatic sprinkler system, which will often save its cost in reduced fire insurance premiums.

iii) SMALL SPILLAGE

This should be cleaned up promptly with rag or absorbent paper. The contaminated material must be disposed of in a proper manner. (See Section 7).

iv) LARGE SPILLAGE

All areas where spillage may occur must be contained so that the spilt resin can be drained off. Any other spillage should be absorbed in suitable material, i.e. dry sand, or sawdust, and shovelled and swept up. Waste disposal precautions are important. (See Section 6).

v) SMALL SKIN CONTACT

This is not normally a hazard if barrier cream has been used. Wash off and re-apply cream.

vi) LARGE SKIN CONTACT

Do not use solvent such as acetone or xylene to remove resin from the skin. Apart from the fire risk the risk of skin irritation and possible dermatitis will be increased. Remove the resin with skin cleansing cream and wash with soap and water.

vii) INGESTION

Do not induce vomiting but seek medical attention without delay.

viii) INHALATION

If giddiness or sickness or any ill effect should be caused by inhalation of styrene vapour the affected person should be taken to fresh air, kept warm, and rested while medical attention is obtained. If breathing should stop then artificial respiration must be administered.

ix) EYE CONTACT

Flush promptly with plenty of water and seek medical attention immediately.

Section 4. Health Hazard Data

The effect of various concentration of styrene has been reported as follows:

- 100 ppm - Maximum allowable concentration
- 400 ppm - Moderate irritation to eyes and lungs
- 1,200 ppm - Extreme irritation to eyes and lungs
- 100,000 ppm - May be fatal

Section 5. Handling and Storage

The storage of polyester resins is subject to the requirements of the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations, which include:

i) Polyester resin storage must either be in the open air and covered with polythene and preferably away from direct sunlight, or in a store which is a fire resisting structure, or in a store in a "safe position" (not defined but may mean isolated). Provision must be made for any spillage to be contained. Stores or storage areas must be boldly marked "Highly Inflammable".

ii) The quantity of polyester resin kept in working areas must not exceed 50 litres (approx. 60 kilos) and must be kept in closed vessels in a fire resisting leak proof cupboard or bin.

iii) Conveyance from stores to working areas should preferably be through a totally enclosed pipework system. Closed vessels designed to avoid spilling or leakage may be used where this is impractical.

Polyester resin will polymerise and gel if not stored correctly. Resin should preferably be stored at temperatures not higher than 20°C (68°F) when the shelf life of most grades will be six months minimum. Very low storage temperatures result in long shelf life but a large increase in resin viscosity, and for many applications cold resin must be brought to workshop temperatures before use. Water must be excluded from all storage containers as this causes slow curing, and will also cause rust to form in steel drums and tanks. Rust is also a cause of premature gelation.

Section 6. Waste Disposal

Any rag or absorbent paper or other material used for cleaning up resin is a fire hazard, as heat and spontaneous combustion can occur, particularly if the resin was catalysed., Also quantities of catalysed resin above 0.1 kilo can generate hazardous exothermic heat if allowed to polymerise in a mass. All soiled or waste materials must be water soaked, and kept in a closed bin until disposed of. Dispose of all waste on a daily basis or more frequently.

Small quantities of resin and resin contaminated waste can be disposed of by burning in an approved incinerator, which will not emit smoke or sparks, and is located in a safe place. Larger quantities of waste are normally disposed of by a waste collection contractor.

This safety data sheet is in the format recommend by the British Resin Manufacturer's Association to whom due acknowledgement is made.

J-CAST 70D POLYURETHANE RESIN

J-Cast 70D is a two part quick curing polyurethane casting system curing at room temperature to a rigid tough material. It is ideal for the rapid production of small castings, models and prototypes, particularly from silicone rubber moulds.

S P E C I F I C A T I O N		
	Part A (Polyol)	Part B (MDI isocyanate)
Appearance	Liquid	Liquid
Colour	Neutral	Brown
Specific Gravity /gcm ³ @25°C	1.02	1.10
Viscosity / mPas@25°C	90-120	20-40

MIXING

Mix the resin component before use to keep in suspension the moisture scavenger. If a talc is to be added to the resin, mix primarily to both parts A and B before combining the hardener to the filled resin. Mix carefully to avoid air entrapment then apply quickly.

- J-Cast 70D Part A 100 parts by weight
- J-Cast 70D Part B 100 parts by weight

- Pot life of 100g @ 25°C 2 to 3 minutes
- Demould @ 25°C 20 to 40 minutes
(depends on the thickness of casting)

AFTER CROSSLINKING

- Shore Hardness/D [ASTM D2 240] 75
- Tensile Strength/Mpa [ASTM D 638] 30
- Elongation at break/% [ASTM D 638] 4.5
- Compressive strength/% [ASTM D 695] 48
- Flexural strength/MN/m² [ASTM D 790] 1,400
- Glass transition/°C [ASTM D 3418] 78

Order ref. AAO 17698	2kg pack
ABO 17698	10kg pack

We are now stocking the Reichhold Gelcoats and Resins which have several advantages over the older types that we have previously supplied. These gelcoats are very high quality, are easier to apply, have less porosity and better gloss retention.

There are considerably more resins available than shown on the following pages which are simply a representative selection including the more important resins which we will normally have available from stock. Resins and gelcoats marked* and any other resins not shown on the list are only available to special order.

All stock gelcoats and resins are pre-accelerated, except 420-100.

The recommended film thickness for all gelcoats is

0.55 - 0.85mm which will normally be achieved by using 700g/m² for brush gelcoats and 500g/m² for spray gelcoats. Due to the ease of application of the modern gelcoats care must be taken to avoid brushing out too thinly.

The following brief specifications may be sufficient for most users, if a full data sheet is required please do not hesitate to contact our sales department.

The following information regarding resins and gelcoats is based on results achieved through laboratory test in the Reichhold technical departments.

The information is correct to the best of our knowledge and is supplied for the guidance of our customers, involving no responsibility on our part.

NORPOL POLYESTER GELCOAT

Type	Old Number	Description	Geltime @ 25°C	Heat Dis. Temp.	Barcol Hardness	Storage Stability Months
GE1 119H	GB 120H GSE 119H	An unpigmented isophthalic 'general purpose' gelcoat for application by brush. Specially formulated for good gloss retention, low porosity and easy application. Lloyds and Det Norske Veritas approved for boat production.	18 - 23 mins 1% Butanox M50	65°C	35 - 40	4
GE1 130H	GS 130H	(White) gelcoat as above.	18 - 23 mins 1% Butanox M50	65°C	35 - 40	4
GX1 119H	PX7028	A 'clear' class I/Class 0 flame retardant gelcoat for brush application. Test pigments for colour stability before large scale use. Normally backed up with 830 - M750.	18 - 23 mins 1% Butanox M50	55°C	36	4
GS 100S	9C8005	An unpigmented isophthalic 'general purpose' gelcoat for application by spray. Specially formulated for good gloss retention, low porosity and easy application. Lloyds and Det Norske Veritas approved for boat production.	6 - 9 mins 1½% Butanox M50	55°C	36	4
GS 8750S	9Y0005	As above but pigmented white	6 - 9 mins 1½% Butanox M50	84°C	40 - 45	4
NGA 103H	NGA 103H	A very high quality unpigmented gelcoat based on neopentyl glycol and isophthalic resin for application by brush. To be used for products exposed to water and chemicals at varying temperatures such as sanitary ware, and high quality boats. Lloyds approved for boat building.	11 - 14 mins 1½% Butanox M50	91-95°C	40 - 50	4
NGA 2000H	NGA 2000H	As above but pigmented white	11 - 14 mins 1½% Butanox M50	91-95°C	40 - 50	4
NGA 103S	NGA 103S	A very high quality unpigmented gelcoat based on neopentyl glycol and isophthalic resin by spray. To be used for products exposed to water and chemicals at varying temperatures such as sanitary ware and high quality boats. Lloyds approved for boat building.	6 - 9 mins 1½% Butanox M50	91-95°C	40 - 50	4
NGA 2000S	NGA 2000S	As above but pigmented white.	6 - 9 mins 1½% Butanox M50	91-95°C	40 - 50	4
GM 9000H	GM 9000H	A very high quality vinylester based tooling gelcoat, pigmented black, for brush application. Hard enough to maintain a very high gloss with reasonable flexibility. For best results a minimum working temperature of 18°C should be maintained before postcuring mould at 80°C for 4 hours.	15 - 25 mins 1½% Butanox M50	110°C	35 - 40	3
GM 100H	GM 100H	An unpigmented version of GM 9000H.	15 - 25 mins 1½% Butanox M50	110°C	35 - 40	3
NGA 102S	NGA 102S	A high quality U.V. stabilised, clear spray quality gelcoat based neopentyl glycol. Isophthalic polyester resin cures with low residual colour and is designed for the application of thin films in the production of simulated marbles.	6 - 9 mins 1½% Butanox M50	91-95°C	40 - 50	4

NORPOL POLYESTER TOPCOATS (FLOWCOAT)

MT 100H	MT 100H	A non-pigmented, isophthalic low styrene emission topcoat. (Flowcoat or washcoat). In effect a gelcoat containing wax which is applied to the reverse surface of a moulding and cures to give a hard, dry surface.	7 - 10 mins 2% Butanox M50	84°C	40 - 45	4
MT 2000H	MT2000H	As above but pigmented white.	7 - 10 mins 2% Butanox M50	84°C	40 - 45	4

NORPOL POLYESTER BONDING PASTE

F1 163	P07031	A cobalt accelerated highly thixotropic resilient bonding paste. Is primarily produced as a curable adhesive paste for bonding polyester laminates, particularly in double skin applications such as doors, floats or other cavity mouldings. The paste also finds application in fixing wood or metal inserts into mouldings prior to lamination.	20 - 30 mins 1% Butanox M50	-	30	6
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NORPOL POLYESTER LAMINATING RESINS

440-M750	44-M-75	The most widely used and popular orthophthalic general purpose resin of the three we stock. It is low viscosity, has a colour change mechanism and is very low styrene emission based on a Scandinavian formula. It is a medium reactivity resin which cures to a light straw colour. Lloyds approved.	15 - 25 mins 1% Butanox M50	62°C	-	6		
429-M748	P07048	A low viscosity general purpose polyester resin - giving rapid impregnation or 'wetting' of the glass reinforcement, combined with fast curing properties and is pre-accelerated and is suitable for hand lay-up or spray applications with catalyst injection.	14 - 18 mins 1% Butanox M50	63°C	-	6		
440-M782	M-780/M78	As above but white pigmented.	14 - 18 1% Butanox M50	63°C	-	6		
999 R202	420 M730	A low viscosity resin with a colour change mechanism and very low styrene emission. It is more reactive than 429-M748 and 440-M750 and can be used to produce 3 or 4 mouldings per day from one small mould, but is not suitable for light colour pigmentation as it cures to a darkish brown colour.	10 - 15 mins 1% Butanox M50	80°C	45	6		
821-M760	82-76	A 'clear' thixotropic laminating resin. Flame retardant class II to B.S.476 Part 7.1971.	13 - 17 mins 1% Butanox M50	55°C	-	6		
844-M730	84-73	A 'clear' thixotropic laminating resin. Flame retardant class I to B.S.476 Part 7.1971.	17 - 22 mins 1% Butanox M50	88°C	-	6		
840-M750	83-75	An antimony filled, thixotropic laminating resin. Flame retardant Class I to B.S.476 Part 7. 1971 and Class 0 to B.S.476 Part 6.1968.	14 - 18 mins 1% Butanox M50	75°C	35 - 40	6		
680-700	68-70	A rigid isophthalic laminating resin with good electrical and heat resistant properties. 680-700 is resistant to oils and similar products, neutral and acidic salts, weak non-oxidising acids and other less aggressive chemicals.	15 - 25 mins 1% Butanox M50	132°C	45	6		
330-610	33-1-61	330-610 is a general purpose polyester for the manufacture of maximum clarity roofing sheets.	20 - 25 mins 2% Butanox M50	50°C	-	6		
440-700	44-70	A medium reactive orthophthalic polyester resin with excellent application properties, impregnates the glassfibre rapidly and is suitable for either hand or spray lay-up applications.	15 - 25 mins 1% Butanox M50	65°C	-	6		
420-100	42-10	A rigid, medium reactive orthophthalic polyester resin, specially formulated for resin injection moulding. 420-100 is non-thixotropic and non-accelerated and requires the addition of either cobalt or cobalt/amine and AAP for curing. A reasonably high filler loading can be used with 420-100. A suggested mix to give approx. 10 minutes geltime and 30 minutes cure is: 420-100.	20kg 420-100 12.5kg Omya BLH 75ml (0.3%) 6% Cobalt 50 ml (0.2%) 100% DMA	} mix set catalyst pump to produce 2% AAP catalyst		67°C	-	6

NORPOL POLYESTER CASTING RESINS

32032-00	340-500	Polylite 32032-00 is a water-white, clear resin designed for applications in which extreme clarity and absence of colour are required. Castings made with PolyLite 32032-00 have the same refractive index as glass. Suggested applications include decorative castings, table tops, objets d'art and biological encapsulations.	1.25% Butanox M50	74°C	35 - 40	3
342-510	35-1-51	Norpul 342-510 is recommended for the production of figurines and other items taken from flexible silicone rubber moulds or those based on hot melt vinyl compounds.	1% Butanox M50	50°C	30 - 35	6

LLEWELLYN RYLANDS POLYESTER GELCOATS

AVAILABLE ON REQUEST

SCOTT BADER POLYESTER GELCOATS

AVAILABLE ON REQUEST

NORD RM2000 TOOLING RESIN

RM2000	<p>RM2000 Tooling Resin is a high quality, filled, polyester tooling resin which enables moulds to be produced in 24 hours. One laminator can make a 1-2 square metre x 12mm thick mould in 5-6 hours, which after 18 hours is fully cured and rigid with no distortion and minimal shrinkage. RM2000 is supplied in 25Kg cans, must be catalysed with CATA2000 and should be used in conjunction with a good quality tooling gel such as Reichhold GM9000.</p> <p style="text-align: center;">ADVANTAGES</p> <ul style="list-style-type: none"> • Easy to use and rapid cure • No shrinkage. Low profile surface <ul style="list-style-type: none"> • Cost reduction • No dimensional deformations 	<p>Gel time</p> <p>40/45 min 1% CATA2000 @20°C</p>	<p>H.D.T.</p> <p>70°C</p>	<p>Storage</p> <p>3 months mix before use</p>
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CATALYSTS FOR POLYESTER RESINS

K1 Catalyst - a medium activity catalyst for general purpose use.

Order ref. AOO 16041 25kg

Butanox LA - a low activity methyl ethyl ketone peroxide (MEKP) for general purpose use.

Order ref.
AOO 16014 100gm/1kg/5kg AOO 16023 30kg

Butanox M50 - a medium activity MEKP for general purpose use.

Order ref.
AOO 16015 100gm/1kg AAO 16016 5kg
AOO 16017 30kg

Butanox HB050 - a high activity MEKP for general purpose use.

Order ref. AOO 16013 5kg
AOO 16031 30kg

The above are methyl ethyl ketone peroxides (MEKP) for general purpose uses.

Trigonox 44B Catalyst - a high activity acetyl acetone peroxide (AAP) usually used for fast curing requirements in machine mould applications.

Order ref.
AOO 16022 30kg

CATA 2000 - a high activity acetyl acetone peroxide (AAP) usually used for fast-curing requirements in mechanised processes and ESSENTIAL for curing RM2000.

Order ref.
AAO 18593 1kg

CH50 Benzoyl Peroxide Lucidol Soluble Powder Catalyst - a 50% benzoyl peroxide soluble powder used for resin injection and cold press moulding in conjunction with an amine accelerator. They give a very rapid gelation and cure, but have the disadvantage that unpigmented mouldings yellow with age.

Order ref.
AOO 16044 100gm/1kg/5kg AOO16024 30kg

Note: Catalysts and accelerators must never be mixed directly together, since an uncontrollable reaction may result. Catalyst is a potentially hazardous material and the following code of practice should be strictly adhered to:

SAFETY PRECAUTIONS IN THE USE AND HANDLING OF PEROXIDE CATALYST

Handling

Always wear eye protection. Avoid contamination - work cleanly.

Measure and transfer in clean, labelled stainless steel, or polythene or similar containers, e.g.. buckets, used only for that purpose.

Transfer only what is needed at one time.

Store in original containers.

Do not smoke or have flames of any kind in the vicinity.

Do not use the containers for anything else, especially not accelerators.

Do not return the excess to the drum.

Do not spill or splash.

Construction of Store

Have cool building far from other hazards, electrical fittings outside if possible or at least flameproof. Brick or other non-combustible materials. Hard floor to facilitate cleaning and dealing with spillage. Small quantities - coal bunker is suitable. Larger amounts - special building.

Do not use windows allowing direct sunlight.

Do not have cloths, or flammable or absorbent materials in the store.

Do not have rusty windows and roof trusses.

Do not have cracked floors enabling spillage to seep into them.

Storage

Use store for organic peroxides exclusively. Keep clean and tidy. Lock at night, keep records and rotate the stock.

Dispose of old materials and samples. Allow air to circulate between the drums of product.

Do not use for other products which are metallic or can burn, especially not for accelerators.

Spillage

On hard surface absorb in sand, kieselghur, Vermiculite, etc. and dispose immediately.

Do not use rags or sawdust as they may be contaminated.

On clothes - remove clothes before peroxide penetrates to skin - WASH.

Do not leave in locker or corner.

On litter rags etc. may ignite - wash or take outside and dispose of.

Do not leave in corner.

Medical

Splash in eye.

Avoid at all costs. If splash occurs wash out AT ONCE with water or 2% sodium bicarbonate or 5% sodium ascorbate if available. Keep eye wash bottles available. Obtain medical attention.

Splash on skin.

Wash off with plenty of soap and water.

Swallowed.

Drink milk/water. Take to hospital for stomach lavage. If far from hospital make patient sick.

In Case of Fire

Organic peroxides will burn very fiercely and may even explode. Fight fire with plenty of water spray. Inform fire brigade of quantity and type of peroxide. Approach large fires from behind cover.

Disposal

Best method is burning. Mix with sand and with equal weight of sawdust. Burn on open ground in heaps up to 1 foot square. Ignite with burning rag on six foot pole.

If not possible add in small lots to 10% caustic soda or saturated sodium sulphite solution. **DO NOT ADD CAUSTIC SODA TO THE PEROXIDE.** Take care that reaction is complete before adding more.

Wall charts and detailed literature can be obtained on application to K & C Mouldings (England) Ltd.

ACCELERATORS FOR POLYESTER RESINS

Two types of accelerators are widely used. One type is based on soluble cobalt salts, and is effective with methyl ethyl ketone peroxide (MEKP) and the other type of accelerator consists of solutions of tertiary amines and is active with benzoyl peroxide. Two concentrations of cobalt accelerator are available 1% and 6% and the following factors are important when considering which type to use.

1. Dilute solutions such as NL49P are easier to measure and weigh when small amounts of resin are involved. For large batches of resin, NL51P is the most economical and results in the addition of less diluent.

2. When a high percentage of accelerator is required the use of dilute solutions in plasticiser may affect the physical properties of the moulding. Under these circumstances if dilute solutions must be used, styrene is the preferred diluent.

Dosage

For NL49 (1% cobalt) additions in the range 0.5 - 4% of the resin recommended, with correspondingly smaller amounts for the more concentrated solutions. As cobalt accelerators are blue in colour, where good colour properties are of prime importance in the finished laminate or casting the amount of accelerator used should be kept to a minimum.

Amine accelerators are used with benzoyl peroxide and will give quick gelation and cure. Used mainly in resin injection and cold press moulding but are prone to yellowing with age.

RYLANDS POLYESTER COLOUR PASTES

The range of colour pastes is based upon pigments carefully selected for heat stability, colour fastness, high opacity and having the minimum effect upon the gel time of the resin mixtures.

A standard range of 106 opaque, polychromatic, metallic and transparent colour pastes is available plus RAL and BS5252 ranges. Rylands Polyester Colour Pastes contain highly dispersed pigments and may be readily mixed directly with the parent resin in slow mechanical mixers or by hand. Violent agitation in high speed mixers should be avoided since this causes aeration with the production of bubbles in the finished mouldings.

The amount of pigment paste required will generally be between 5 - 10%, but with some colours 2 - 3%, calculated on the weight of the resin will be found to be sufficient. Less colour paste will be required to be used in the lay up resin. 3602 and 3929 black accelerated resin mix should be used in less than 24 hours to avoid cobalt absorption.

For transparent colours the amount of colour paste required can vary from 2 - 10% depending on the thickness of moulding and depth of colour required in order to achieve a uniform finish. With polychromatic and metallic colour pastes spray application of the gel coat is recommended, and to obtain the best results they should be backed up with white.

Metallic colours numbered 11728 and 12146 are not recommended for use where a moulded article is to be exposed to the weather.

Where mouldings are produced which are components of a larger structure care should be taken to mix sufficient colour paste and resin to complete the job and so avoid colour variations. Variations of colour between mouldings can often occur from several causes. Inaccuracy of measuring of components. Variations in catalyst and accelerator quantities in resin mixes. Considerable variations in colour can result from the incorporation of colour pastes by volume.

Care must be taken to see that the percentage of given colour paste is the same in each gel coat mix. Variations in time and temperature of cure will also affect the consistency of colours between mouldings. It has been found in practice that not only should sufficient mixed colour resin be prepared for all components of a structure at one time, but also that moulding should be laid up and cured under the same conditions of time and temperature. Certain pigments undergo a change in shade when subject to high temperature. Specially compounded pigment pastes are supplied for use with hot moulding methods and also for resin systems used in cold press moulding where colour can be affected likewise.

Following the introduction of isophthalic polyester resins an increase in colour separation has occurred. Colour separation is primarily the disturbance of the gel coat surface by "sag" prior to gelation, undetectable during moulding and often caused by resin losing viscosity immediately before gelation.

Gel coats should, therefore, be applied as evenly as possible and brushed in two directions. Colour separation bears a relationship to high humidity of the atmosphere. The elevation of temperature in a moulding shop often carries with it an increase in humidity causing moisture to condense on cold mould surfaces.

The evaporation of water from release agents will also increase the humidity. Gel coats of pastel shades which contain a large proportion of white tinting colour develop colour separation more readily since white pigments most commonly used are more sensitive to moisture.

See price list for complete colour range.

Colour charts are available at a nominal charge.

Note: Some colours have colour match problems between batches.

METAL POWDERS

For adding to gel coats for decorative finishes and cold cast sculpture. The maximum amount of powder should be added to get the best results.

Stock powders: Iron, aluminium, bronze, copper, brass, nickel brass.

Order ref.

AOO 16750 Aluminium
AOO 16758 Iron

AOO 16754 Tin Bronze
AOO 16752 Brass

SUCCESSFUL COLD-CASTING AND MOULD MAKING by Robert Spenick

"Successful Cold-Casting and Mould Making" is a 50 page book that is both educational and inspirational. It is written in simple terms that will enable a beginner to make flexible moulds and simulated metal castings while setting up a small business to sell the castings.

Order ref. AOO 16177

METALLIC JEWELS

These materials are pigmented, light fast flakes of epoxy coated aluminium, used at a loading of around 10 -15% in the gel coat of GRP laminates to provide an attractive decorative finish. Best results are obtained by spray application of the gel coat, and by backing up the gel coat with a laminating resin pigmented in a colour which closely resembles that of the metallic jewels in the gel coat. Since there are very many colours and particle sizes of these materials available, we are maintaining stocks of all colours in the most popular particle size micro 1/2 (0.015" x 0.008").

Metallic jewels are at present extensively used in cars, boats and funfair equipment and are rapidly gaining acceptance in the more mundane moulding applications.

For full application instructions refer to end of catalogue.

We also stock the following colours in a large size (0.015" x 0.015" x 0.000045"). Most other colours can usually be supplied in this larger size at short notice.

The usage rate is approximately 100grms/M² of moulding surface.

COLOURS AVAILABLE: Size .015 x .015 x .00045

Order ref.	Description	Order ref.	Description
AAO 18500	1E Bright Silver	AAO 18525	26E Lavender
AAO 18502	3E Pale Gold	AAO 18526	27E Salmon
AAO 18503	4E Dark Gold	AAO 18529	30E Brilliant Copper
AAO 18505	6E Chartreuse	AAO 18530	31E Antique Brown
AAO 18506	7E Golden Orange	AAO 18531	32E Black Fox
AAO 18507	8E Brilliant Orange	AAO 18534	35E Gun Metal
AAO 18509	10E Brilliant Red	AAO 18535	36E Soft Black
AAO 18511	12E Fuchsia	AAO 18536	37E Crimson
AAO 18512	13E Purple	AAO 18538	39E Nottingham Forest
AAO 18514	15E Royal Blue	AAO 18541	43E Rich Red Gold
AAO 18516	17E Medium Blue	AAO 18542	45E Dusty Rose
AAO 18519	20E Emerald	AAO 18543	60E Limetreuse
AAO 18524	25E Sky Blue		

COLOURS AVAILABLE: Size .008 x .015 x .00045

Order ref.	Description	Order ref.	Description
ACO 16765	1E Bright Silver	ACO 16788	24E Ice Blue
ACO 16766	2E Sand	ACO 16789	25E Sky Blue
ACO 16767	3E Pale Gold	ACO 16790	26E Lavender
ACO 16768	4E Dark Gold	ACO 16791	27E Salmon
ACO 16769	5E Gold Fiesta	ACO 16792	28E Shell Pink
ACO 16770	6E Chartreuse	ACO 16793	29E Nutmeg
ACO 16771	7E Golden Orange	ACO 16794	30E Brilliant Copper
ACO 16772	8E Bright Orange	ACO 16795	31E Antique Brown
ACO 16773	9E Apricot	ACO 16796	32E Black Fox
ACO 16774	10E Brilliant Red	ACO 16797	33E Holiday
ACO 16775	11E Jubilee	ACO 16798	34E Antique Blue
ACO 16776	12E Fuchsia	ACO 16799	35E Gun Metal
ACO 16777	13E Purple	ACO 16800	36E Soft Black
ACO 16778	14E Prussian Blue	ACO 16801	37E Crimson
ACO 16779	15E Royal Blue	ACO 16802	38E Moss Green
ACO 16780	16E Peacock	ACO 16803	39E Nottingham Forest
ACO 16781	17E Medium Blue	ACO 16804	40E Grey Fox
ACO 16782	18E Aqua	ACO 16805	41E Cherrywood
ACO 16783	19E Spring Green	ACO 16806	43E Rich Red Gold
ACO 16784	20E Emerald	ACO 16807	45E Dusty Rose
ACO 16785	21E River Green	ACO 16808	60E Limetreuse
ACO 16786	22E Gold Fire	ACO 16809	Speed Sparks
ACO 16787	23E Sea Green		

WAX ADDITIVES

A paraffin wax solution for adding to gelcoat resins used for coating the backs of mouldings, prevents the sticky surface caused by the air inhibition of the surface of the gel coat resin. Add 1% to laminating resins and 2% to gelcoats.

Order ref.

AA 017990 1kg

AB 017990 4kg

SECTION 8

GLASSFIBRE REINFORCING MATERIALS

CHOPPED STRAND GLASFIBRE MAT

We offer a range of 3 general purpose chopped strand glassfibre mats which are all suitable for hand laminating in open moulds.

CHOPPED STRAND GLASFIBRE MAT M5

M5 chopped strand mat is made from E-glass chopped strands. They are held together by an emulsion binder, soluble in styrene, which gives M5 an excellent compatibility with UP resins. It is designed for general purpose use in a wide range of applications, offering medium impregnation speed and good conformability to mould shape.

Order ref.	Weight M ²	Weight per Roll (approx)	Width	Area per Roll (approx)
AAO 17915	300g	25kg	92cm	83m ²
AAO 17916	450g	25kg	92cm	55m ²
AAO 17917	600g	25kg	92cm	42m ²
AAO 17919	900g	40-50kg	92cm	44-55m ²

CHOPPED STRAND GLASFIBRE MAT M534

M534 chopped strand mat is made from E-glass chopped strands, held together by an emulsion binder, soluble in styrene. It is designed for easy mould conformability and good impregnation properties.

Order ref.	Weight M ²	Weight per Roll (approx)	Width	Area per Roll (approx)
AAO 16369	300g	40-50kg	92cm	133-166m ²
AAO 16377	450g	40-50kg	92cm	88-111m ²
AAO 16370	600g	40-50kg	92cm	66-83m ²

CHOPPED STRAND GLASFIBRE MAT M123/POWDER BOUND

M123 chopped strand mat is made from E-glass chopped strands, held together by a powder binder, soluble in styrene. It is designed for easy impregnation and good translucency. It is particularly recommended for translucent mouldings where the best effects are obtained by using a polyester resin with matching refractive index.

Order ref.	Weight M ²	Weight per Roll (approx)	Width	Area per Roll (approx)
AAO 17921	300g	50-65kg	100cm*	166-216m ²
AAO 17922	450g	50-65kg	100cm*	111-144m ²
AAO 17923	600g	50-65kg	100cm*	83-108m ²

*Width of powder board M123 varies dependant upon availability.

GLASFIBRE ROVINGS FOR SPRAY-UP P207

P207 is an E-glass continuous roving which has a sizing system with a silane coupling agent. It is designed for general purpose applications in a wide range of sectors and provides good chopping behaviour and optimal overall performance for spray-up applications.

Order ref.	Tex	Weight per Cheese (approx)	Cheese dimension
AAO 16378	2400	19kg	280mm O.D. x 260mm height

CHOPPED GLASFIBRE STRANDS

Chopped glassfibre strands are a general purpose product, suitable either for polyester or phenolic resin or epoxy reinforcement. It offers good dimensions and impregnation characteristics and high mechanical properties in injection on compression moulded parts. It can also be mixed with a resin to form a "dough" for reinforcement of intricate cavities.

Order ref.	Tex	Strand lengths	Weight per bag
AAO 16382	2400	6mm	10kg
AAO 16382	2400	12mm	10kg

Storage

All glassfibre mats and roving should be stored dry and in its original packaging. The best conditions are temperature between 10 and 35°C and at a relative humidity between 35 and 85%.

If the product is stored at low temperature (below 15°C) it is advisable to condition it in the workshop, for at least 24 hours before use, to prevent condensation.

The product can be stacked one plus one but it is recommended to use a plywood plate between the two pallets in order not to damage the lower pallet.

SURFACING TISSUE M524-664

Surfacing tissue is made from very fine glassfibres which are chemically-resistant in both acid and alkaline environments. It is bound using a modified styrene-acrylic co-polymer which is formulated to be compatible with all commonly used resin systems. It is used to produce a resin-rich surface as either a gelcoat replacement or a mask for coarse glassfibres.

Order ref.	Weight/M ²	Thickness	Roll Length	Roll Width	Area per roll
AAO 16386	30g	0.29mm	250m	1m	250m ²

GLASS TAPES

A plain-weave glassfibre tape woven from continuous filament yarns. Used for winding, wrapping and local reinforcements.

Order ref.	Weight/M ²	Roll Width	Roll Length	Area per roll
AOO 16425	100g	25mm (1")	50m	1.25m ²
AOO 16426	100g	40mm (1½")	50m	1.85m ²
AOO 16427	100g	50mm (2")	50m	2.5m ²
AOO 16428	100g	75mm (3")	50m	3.8m ²
AOO 16429	100g	100mm (4")	50m	5m ²
AOO 16430	100g	150mm (6")	50m	7.6m ²

WOVEN ROVINGS

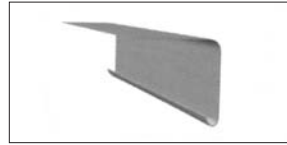
Woven roving is a plain weave glassfibre fabric, which has a surface dressing rendering it suitable for use with polyester or epoxy resins.

Woven rovings are often used in composite laminates with chopped strand mat, the latter being used to increase the bulk of the laminate. Rovings wet out far more quickly than certain types of mat, pick up a lower percentage of resin, approx. 50% glass, 50% resin, and have far higher physical properties. A roving laminate, thickness for thickness is much stronger than an all mat laminate, and a thinner, lighter and less expensive laminate can often be made.

We stock woven rovings normally in 300g and 600gm/m² but due to the variety of weights and widths, please contact us with your requirements.

GRP FLAT-ROOFING TRIMS

Due to the ever increasing popularity of GRP for flat roofing we offer a range of GRP roof trims to complement our ranges of resin and glassfibre. The trims are light grey in colour, U.V. stabilised, 550g/M², in 3M lengths and fire retardant to BS476 part 3, We show below a representative selection of the most popular sections but many others are available. Please request further details.



Fascia Trim

Dimensions:

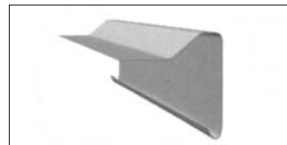
Girth: 200mm

Depth: 90mm

Application:

Fitted to roof edge to allow drainage into gutter. Compatible with C1 universal corners.

Order ref. AAO19010



Raised Edge Trim

Dimensions:

Girth: 230mm

Depth: 105mm

Application:

Flat roof edge detail to prevent water run off.

Order ref. AAO19011



Raised Edge Trim

Dimensions:

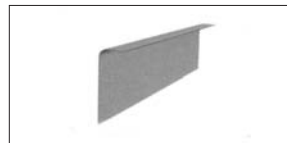
Girth: 260mm

Depth: 125mm

Application:

Roof edge detail to prevent water run off.

Order ref. AAO19012



Simulated Lead Flashing

Dimensions:

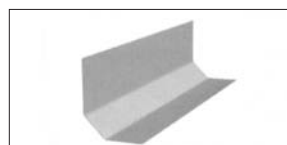
Vertical Cover: 100mm

Wall Penetration: 35mm

Application:

Replaces traditional lead flashing. Dark grey, non-adhesion finish to simulate the appearance of lead. Do not top coat!

Order ref. AAO19013



Wall Fillet

Dimensions:

Girth: 260mm

Flanges: 100 & 80mm

Upstand Height: 120mm

Application:

Asymmetrical fillet trim for use against abutting walls. Also provides expansion and perimeter ventilation.

Order ref. AAO19014

SECTION 9

FILLERS FOR POLYESTER AND EPOXY RESINS

AEROSIL-CABOSIL

This is a high-porosity, synthetic, amorphous milled silica designed to impart thixotropic qualities to polyester resin.

2 - 10% by weight can be mixed with laminating resin to increase thickness to a gelcoat type viscosity. Supplied in 10kg bags.

Order ref. AOO 16277 10kg bag

OMYA BLH

Omya BLH is a unique filler in a class of its own and provides useful improvements in GRP mouldings. Omya BLH will increase tensile, compressive and impact strength to a greater degree than other fillers, as well as providing a marked increase in flexural strength, and will considerably decrease shrinkage and warping in all types of GRP mouldings.

Moreover, the surface treatment enables higher loadings to be used for the same resin mix viscosity, and eases re-dispersion should the filler settle out after standing in resin for a long time. The loading at which it is incorporated into the resin is purely dependent upon the maximum tolerable working viscosity of the resin mix; the higher the filler loading the better. A rough guide would be the following resin:filler ratios by weight.

Hand lay up	2 parts of resin to 1 of filler
Spray lay up	3 parts of resin to 1 of filler
Cold press mouldings	4 parts of resin to 3 of filler
Hot press mouldings	2 parts of resin to 3 of filler

Order ref. AOO 16280 25kg bag

Q-CELL LIGHTWEIGHT FILLER

Q-CELL lightweight filler consists of hollow inorganic microspheres with exceptional whiteness and low bulk density. It may be used a volume extender in any thermoplastic or thermoset resin where a lightweight closed-cell structure is required, and is a particularly useful in producing syntactic cast polyester foams.

The use of inorganic, synthetic hollow spheres as a filler in thermosetting resins can provide significant raw material cost savings while maintaining equal strength, reducing weight and improving impact properties. The main advantages of using Q-CELL microspheres are that they will not upset the basic properties of a GRP laminate or polyester casting, but will often enhance many physical and mechanical characteristics. This, combined with consistency, weight and cost reduction, results in Q-CELL providing an economical way of extending polyester resin, furthering the use of polyester resins in applications where a light weight is of primary importance.

Q-CELL is added to resin at the rate of 0.5 - 10% by weight dependent upon application, and up to 20% can be added if a paste consistency is required.

Order ref. AOO 16295 27.22kg box

TALC

This is a pure talc of even texture and softness, which is incorporated into polyester resins at a loading of around 1½ parts of filler to one part of resin by weight, for the manufacture of car body stopping compounds. It is widely used by many manufacturers for this purpose, its main virtue being softness, which enables the cured compound to be easily sanded down.

Order ref. AAO 16293 25kg bag

FILLITE

Fillite is a glass hard, inert silicate in the form of high strength hollow spheres ranging from 5-300 microns in diameter. The material is a versatile filler with unique properties which render it eminently adaptable for use in modern technology. If you need a filler for plastic or glassfibre composites, or any other type of heat resistant, high strength, or chemically inert product, Fillite offers you the following:

1. Light-weight. The S.G. range is from 0.3 to 0.7.
2. Flows freely because it is spherical.
3. Loadings of up to 70% can be attained.
4. Outstanding properties as a thermal barrier.
5. Combined readily with resins, glassfibre and plastics to form a new and exciting field of composites.

At present Fillite is used extensively in many diverse applications including sanitary ware, boat building, decorative castings, etc. and is recommended by resin manufacturers for improving the physical properties of their products.

Order ref. AOO 16285 20kg bags

3M GLASS BUBBLES TYPE K20

3M Glass Bubbles are very fine hollow glass spheres of consistent shape, wall thickness and size distribution, suitable for use as a cost effective volume filler. In appearance they are white opaque free-flowing powders of very low bulk density.

3M Glass Bubbles are made from E-glass (sodalime-borosilicate), giving a high crush strength and an associated very low percentage of damaged sphere shells. This gives the properties of good thermal and acoustic insulation in the final product as well, of course, as a reduction in product density. E-glass is also completely insoluble in water and reasonably hydrophobic, making 3M Glass Bubbles a free-flowing powder even in conditions of high humidity and suitable for any marine application. All grades are suitable for incorporation into thermosetting resins, thermoplastic polymers, bonding materials and explosives.

Order ref. ABO 16287 10kg carton

SECTION 10

SANDWICH CORE MATERIALS

FLEXOKORE Balsa CORE MATERIAL

Probably the best known core material available to the GRP moulder, Balsa wood has been widely accepted and used for many years in the construction of GRP boats and large commercial mouldings.

Flexokore is produced from small rectangles of end grain Balsa with a glassfibre scrim backing that retains the panels integrity while allowing sufficient flexibility to conform to compound curves.

Flexokore has been approved by Lloyds Register of Shipping and Det Norske Veritas for use in the construction of yachts and small craft.

Flexokore is supplied in 2' x 4' panels with thickness of 1/4", 3/8", 1/2", 5/8", 3/4" and 1".

Order ref.

AOO 15942 1/4" 6mm
AOO 15943 3/8" 9mm
AOO 15944 1/2" 12mm

AOO 15945 5/8" 6mm
AOO 15946 3/4" 18mm
AOO 15947 1" 25mm

POLYURETHANE FOAM RESIN

Supplied as a two-part pack, a resin and a foaming agent are weighed out in the proportions of 1:1.16 by weight, or 1:1 by volume, part A requires pre-mixing prior to mixing with part B, which when mixed will expand and create a tough but light foam with a density of approximately 32kg/M³. Mixing requires approximately 1 minute, pouring a further 1/2-1 minute and after a total of approximately 5 minutes the foam is fully hardened. It is poured into cavities for insulation and buoyancy purposes although it is not suitable for vessels made to Lloyds standards. Two of its more interesting uses are filling bodywork cavities between boot and driver compartments on saloon racing cars and manufacturing personalised racing car seats. (See instructions at rear). 2kgs of liquid mixture @ 20°C will produce approximately 0.33M³ (2.2'³).

Order ref.

A0017164/5 2kg pack AD017164/5 20kg pack
AB017164/5 5kg pack AE017164/5 50kg pack
AC017164/5 10kg pack

POLYURETHANE FOAM SHEET

A closed cell foam compatible with polyester resins. For buoyancy, and forming light-weight stiffening ribs in GRP mouldings. One cubic foot of polyurethane

foam sheet will provide at least 60lbs (27kgs) of positive buoyancy. Stock thickness 1/2" (12mm), 3/4" (19mm), 1" (25mm), 2" (50mm), 3" (75mm) and 4" (100mm) in sheets 4' x 3' (1219mm x 914mm), nominal density 2lb (900grms) cu. ft.

Other sizes available.

SCORE BOARD

This is a rigid urethane foam which has narrow slots cut part way through on both sides of the sheet, to enable it to conform, to a compound radius making it easy to fabricate sandwich construction.

During the laminating the slots become filled with resin, resulting in a solid construction.

Available in sheets 2' x 2' and in thicknesses of 1/2" upwards.

Order ref. AAO 17160

POLYCORE

Polycore is a high strength, low weight Core Material constructed from a non-woven continuous polyester fibre fabric encapsulating microballoons.

Polycore is used as a core material and anti-print layer in the production of GRP mouldings such as boats, building panels, tanks, automotive parts etc.

Polycore reduces resin usage in laminates due to the micro-balloon technology.

For Example:

1mm chopped strand mat laminate, 450gm/m² csm + 1050gm/m² resin = 1500gm.

1mm Polycore laminate, 60gm/m² Polycore + 650gm/m² resin = 710gm.

- Polycore can offer a weight saving of over 50%.
- Polycore reduces exotherm and shrinkage.
- Polycore provides excellent anti-print through properties, avoiding woven roving pattern in gel coats and preventing the print-through of ribs and inserts.
 - Polycore offers consistent laminate thickness.
 - Polycore can be used as a bedding layer for balsa or foam.

POLYCORE SPECIFICATION

	1mm	2mm	3mm	4mm	5mm
Dry Thickness (nominal) mm	1.3	2.1	3.1	4.1	5.1
Wet Thickness (nominal) mm	1.2	2.0	3.0	4.0	5.0
Weight Dry gm	60	90	135	160	200
Resin Pick-Up kg/m	0.65	1.30	1.95	2.60	3.25

Properties of Polycore impregnated with Polyester Resin

Tensile Strength	N/mm	6.1
Tensile Modulus	N/mm	1078
Flexular Strength	N/mm	13.7
Flexular Modulus	N/mm	1666

See page 83 for instructions for use

SECTION 11

MOULD POLISHES, BURNISHING COMPOUNDS, RELEASE AGENTS

THE FARÉCLA PROFILE RANGE

In response to customer demand, Farécla have applied their surface finishing expertise to the development of a range of integrated systems to cater for the specific needs of the marine and industrial sectors.

In their experience, the use of the correct combination of compound and applicator is critical to achieving the best results and these new systems, which are at the leading edge of technological innovation, will perform better than existing products and be quicker to use.

The Marine-Industrial Profile rubbing compounds and applicators are the first in a range of systems to be introduced to meet increasing needs of the marine sector plus wider industrial uses including:

- Aerospace
- Wind energy
- Furniture
- Transportation
- Construction – composites, acrylics & other plastics
- Consumer – bathroom and kitchen

Tooling Gelcoat Rectification

The production and maintenance of moulds and plug tooling gelcoats for the marine industry is a key stage in the manufacturing process.

by producing a top quality finish at this stage, post production polishing is kept to a minimum.

The Farécla profile range of rubbing compounds is designed to be used for the removal of surface defects at the mould production stage, minimising the need to polish the finished form.

Profile 200 Coarse Cut

For the removal of P1000 wet and dry abrasive paper marks

- Designed to achieve maximum cutting action when used with the Farécla Advanced G Mop Wool Compounding Pad
- Removes coarse sanding marks in preparation for step 2 polishing (Profile 400)
- Depending upon the type of gelcoat used, coarser grades of abrasive paper marks can be removed
- For machine application only
- Supplied in 3.5Kg container



Order ref. A0016000 3.5kg (Replaces G3, G6 or G7)

Farécla Profile 400 Medium Cut

For the removal of P1500 wet and dry abrasive paper marks

- Designed to achieve optimum cut whilst minimising swirls
- Permanently removes fine abrasive marks
- Provides a high gloss finish
- Ideal for re-furbishment work
- For machine or hand application
- Supplied in 1 litre container



Order ref. A0016001 1 ltr (Replaces G4)

Farécla Profile 600 Fine Cut

For the removal of P2000 wet and dry abrasive paper marks.

- Farécla Profile 600 Fine Cut
- Farécla advanced G Mop lambswool pad
- Removes fine surface blemishes to leave a high gloss finish
- Cleans and restores colour to the surface
- Particularly suitable for dark coloured gelcoats
- For machine or hand application

Order ref. A0016002 1 ltr (Replaces G10)

Farécla Profile Glaze

For the ultimate finish

- Enhances the gloss level of the finished product
- Offers a semi-durable protection against dirt and water
- Especially suited to dark coloured gelcoats
- For machine application only
- Supplied in 1 litre container



Order ref. A0016003 1 ltr

HONEY WAX PASTE

This unique, high-gloss paste wax has been specially formulated for use in the reinforced fibreglass product markets as a mould release agent. Compounded with the purest grade carnauba wax, plus special binders and spreading agents. Honey Wax creates a durable wax surface that remains intact for multiple pulls while eliminating build of excess wax.

The exceptional ease of application and buffing drastically reduces man hours needed for complete mould coverage and maximum gloss. This adds up to faster turnover per mould.

Order ref. AA0 16835

GOLDEN WAX

Golden Wax is a release wax based on the well proven qualities of Honey Wax Liquid, but with the inclusion of a mould cleaning additive.

It has a special cleaning agent that removes old waxes as it applies a brilliant lustre and high class release properties.

Golden Wax will ensure that you never again suffer from problems with mould wax build up even on moulds with irregular textures that normally encourage wax build-up.

Due to its special cleaning properties Golden Wax should never be used on new moulds which should always be 'run-in' using a wax such as Honey Wax paste.

Order ref. A00 16834

MEGUIARS INDUSTRIAL RELEASE SYSTEM

MO 164 Heavy Duty Machine Cleaner

An abrasive cleanser designed to polish out the fine scratches caused by fine wet and dry paper and produce a gloss finish.

Order ref. AA0 16837

MO 364 Machine Glaze and Sealer

A material designed to seal and glaze a mould surface, produces a high gloss.

Order ref. AA0 16839

MO 811 Mould Release Wax

Proven through years of use, worldwide, to produce more releases per application with complete safety. Eliminates the need for additional release agents. MO 811 develops a hard dry durable finish without creating wax build up when used as directed.

Order ref. AA0 16841

M 8711 Paste Wax

M 8711 fulfills all the functions of MO 811 wax when used in a higher temperature environment.

When temperatures of over 45°C are likely to be experienced on the mould surface - for example due to the exotherm during cold press moulding - this wax should be used.

Order ref. AA0 16843

MEGUIARS ACRYLIC REFINISHING SYSTEM

Perspex Cleaner

A paste with an exclusive non-scratching formulation which cleans effectively without harsh abrasives and removes the mass of fine hairline scratches which can accumulate on perspex surfaces. M1708 should be applied on turkish towelling by hand. M1708 is ideal for all perspex products ranging from baths to aeroplane canopies.

Order ref.
A00 16899 Plastic Cleaner 8oz M 1708

Perspex Polish

A polish for use after M1708. It will leave a durable polished surface which is scratch resistant. The anti-static ingredients actually repel dust from perspex surfaces. M 1008 is especially ideal when a brilliant gloss finish is desired. It is best applied with turkish towelling by hand.

Order ref.
A00 16901 Plastic Polish 8oz M 1008
A00 16902 Plastic Polish 64oz M 1064

M 1008 polish passes USA Military specifications MIL C5547 and MIL C18767B (ASG)

RELEASE AGENTS

The following release agents (nos. 1 - 4) are high class products designed specifically for use in the GRP industry.

They may all (except No. 4) be applied by wiping on with a lint free cloth, but the best and most economical results will always be obtained by application with a low output low pressure spray gun.

It is essential to apply No. 4 release agent by spray to obtain the matt finish.

Mould Release Universal Agent No 1

A rapid drying molecular type release agent with excellent release properties. Suitable for polyester or epoxy mouldings even from an irregular surface, and particularly suitable for moulding from plaster as it is waterproof.

Non-flammable Mould Release Agent No. 1 gives a very positive release system, if you have a problem with an unusual material or product it will almost certainly resolve it.

Supplied in 5kg and 25kg cans.

Order ref.

AAO 15250 5kg can ABO 17250 25kg can

Mould Release Agent No. 2

A concentrated polyvinyl alcohol solution which requires dilution with four times its volume of water. Slow drying, but produces an excellent finish. The mould should be polished with a release wax prior to application of release agent. non-toxic, non-volatile.

Packed in 1kg, 4kg, 175kg cans.

Order ref.

ABO 17251 Clear ABO 17251 Blue

Mould Release Agent No. 3

A quick drying polyvinyl alcohol solution which forms an almost invisible barrier to ensure easy moulding release. The mould should be polished with a release wax prior to application of release agent.

Available colourless or blue.

Packed in 4kg containers.

Flashpoint 75°F.

Order ref.

ABO 17252 Clear
ABO 17256 Blue

Mould Release Agent No 4 Matt

A quick drying polyvinyl alcohol solution tinted light blue. Must be sprayed to achieve perfect results. The mould should be polished with a release wax prior to application of release agents.

Supplied in 4½kg containers.

Flashpoint 75°F

N.B. The container should be shaken and inverted weekly to avoid settlement.

Order ref. AAO 17254

Mould Release Agent Super S

Developed for use with flexible polyurethane moulds such as Formaflex. It is also suitable for polyurethane foam and epoxy mouldings.

Supplied in 16oz (454gm) aerosol cans.

Order ref. AAO 17255

DOWNLAND INDUSTRIAL MOULD WAX

A hard carnauba wax polish with excellent release properties for a good commercial finish. It is the ideal wax to use in conjunction with PVA release agents as it does not cause the "run-off" effect often noticed when PVA is applied to the more sophisticated modern waxes. It is also widely used to fill and mask the joins in split moulds.

Order ref.

AAO 16833 500 gm
ABO 16833 4kg

KANTSTIK CURE FAST *Semi-permanent mould release agent*

A unique fast cure, one-step semi-permanent release system, which will effectively seal the pores on both new and re-conditioned tooling in the fabrication of polyester and epoxy base surfaced composite parts. Kantstik Cure Fast provides positive release with accurate surface reproduction.

Kantstik Cure Fast:

- Uses the latest "Dry Film Lubrication Technology"
- Sealer and release agent are incorporated into one product for one-step application
- No cure time needed between coats
- Allows multiple moulding cycles between applications
- Withstands high moulding temperature conditions in excess of 700°F, without deterioration
- Non-transferable
- Not affecting post-processing operations

Kantstik Cure Fast is particularly useful when using thermosets such as polyester, epoxy, melamine and phenolic resin composite materials; thermoplastic resins, such as PVC, ABS, nylon, PP, PE and acrylics.

Method of Application

The mould surface should be thoroughly cleaned. Kantstik Mould Cleaner is ideal for this purpose.

Apply Kantstik Cure Fast by wiping the mould surface with a cotton cloth or spraying making sure of complete uniform coverage of no more than a few square feet at a time. Avoid over application.

Wait approximately 15 seconds after applying and while the film is still wet, wipe with a clean dry cotton cloth. Repeat until entire mould surface is covered. Apply three to five coats. No cure time between coats is required. Wait approximately 20 to 40 minutes for final curing before moulding.

Order ref.

A00 16904 3.6ltr (1 x US gall)

KANTSTIK MOULD CLEANER

Kantstik Mould Cleaner is a special blend of solvents designed to dissolve and remove most release agents and resin buildup from moulds without dulling the surface. It is ideal for preparing mould surfaces for the application of Kantstik Mould Release Agents.

Order ref.

AB0 16905 5ltr A00 16905 18ltr

SECTION 12

FLEXIBLE MOULD MAKING MATERIALS

FLEXIL - S RTV 25C + 5% CATALYST S

Flexil-S RTV 25C + 5% Catalyst S is a two part silicone elastomer which cures at room temperature. It is used to make conventional cast moulds or with the addition of 1 or 2% Tixo additive can be used to make "skin" moulds for highly detailed resin castings.

ADVANTAGES

- High elongation
- Good tear strength
- Precise reproduction
- Low shrinkage

APPLICATIONS

Suitable for the reproduction of models for scenery, restoration, fibrous plasterwork, palaeontology etc. Useable with thixotropic agents Additive for application by stiff brush or knife.

CHARACTERISTICS

(a)

	RTV 25C	Catalyst S
Appearance	Viscous fluid	Fluid
Colour	Beige/White	Green
Specific Gravity gcm ³ @ 20°C	1.27	1.00
Viscosity/cps	24,000	55

MIXING

(b)

RTV + 5% Catalyst S Green	Pot Life /mins	Demould /hours
	75	16-24

AFTER CROSSLINKING

(c)

Shore Hardness/A [ASTM D2 240 2mm film]	25
Tensile Strength/Mpa DIN 535041]	4.1
Elongation at break/% [DIN 53504]	450
Tear Strength KN/m [ASTMAS D624 Notched Die B]	20
Linear Shrinkage	<0.5

ADDITIVES

(d)

Thixotropic Additives when added at 1-5% to the catalysed mix will make the mixture applicable by a stiff brush or pallet knife.

PACKING

Available in 21kg, 5kg and 1kg kits

HEALTH & SAFETY

(Refer to Health Safety Data Sheet)

Handling and mixing of Flexil-S RTV 25C & Cat S require the following precautions:

- Wear gloves & goggles
- Do not eat, drink or smoke
- Avoid swallowing, skin or eye contact
- If contact does occur, wash with clean water immediately & in case of eye contact, consult a doctor

SHELF LIFE

Flexil-S RTV 25C & Cat S have a minimum shelf life of six months when stored in the original containers at temperature between 18 and 25°C.

Note:

If allowed to freeze the RTV will be spoilt. If allowed to heat to excessive temperatures, gel times will be substantially shortened.

The cured mould can be used 24 hours after pouring but if the best long-term properties are required it should not be used for 5-7 days after manufacture.

TIXO T1A ADDITIVE

Order ref.

AAO 17857 50gram AAO 17858 500g

LATEX RUBBER

Latex Rubber is a liquid prevulcanised natural rubber for flexible mould manufacture. Latex Rubber moulds are widely used for applications such as cast resin chessmen and concrete garden ornaments.

The moulds are ideally made by the dipping process (see page 81) but can also be made by brushing and air-drying layers to achieve the appropriate thickness.

Typical Properties:

- Liquid Latex
 - Total Solids Content ca 61.0%
 - Ammonia Content ca 0.6%
 - PH ca 10.5
 - Viscosity @ 30°C (Ford cup no. 3) ca 35 secs.
- Latex Mould
 - Modulus 700% elongation 8.0 Mpa
 - Tensile Strength 22.0 Mpa
 - Elongation at break 900%

Order ref.

AAO 16610 4kg ABO 16610 20kg

MELTING POTS TYPE DPS

The DPS range of standard melting pots have been designed for industrial and hobbyist melting of vinyl compounds, waxes, glues and plastics etc. for coating, casting, protecting etc.

Pots are electrically heated and thermostat temperature controlled from 50°C to 200°C. Constructed from anodised aluminium with ceramic fibre insulation. 220/240 volt standard, 110V etc. available.

Pots supplied with 2m cable and fused plug, lifting handle, double wall heat conserving lid, on/off switch, safety thermal cut-out and available with pouring spout. Alternative thermostats with ranges of 30° to 90°C, 30° to 120°C and 50° to 300°C are available.

TYPE	CAPACITY		INTERNAL DIMENSIONS diameter x depth		WATTAGE NOMINAL		WEIGHT Kg
	litres	pints	mm	inch	vinyl	max	
DPS 2.5	2.5	4.4	150 x 140	6 x 5.5	275	600	4
DPS 6	6	10.5	200 x 190	8 x 7.5	600	1125	6
DPS 12	12	21	250 x 240	10 x 9.5	1050	1650	8
DPS 20	20	35	300 x 290	12 x 11.5	1975	1975	10

Also available in sizes from 40 litres to 250 litres.

Order ref.

AOO 16335 2-5ltr

AOO 16338 40ltr

AOO 16336 6ltr

AOO 16345 100ltr

AOO 16337 12ltr

AOO 16346 200ltr



FLEXIL PVC HOT MELT COMPOUND

A flexible vinyl compound which is melted by heating. The pattern used must be made of a material which is not affected by heat. Old moulds may be melted for re-use.

Flexil is supplied in two grades as follows:

Hard grade HG Blue.

Soft grade SG Natural.

No release agent required.

Both have a melt temperature of 150 - 165°C and

pouring temperature of 140 - 150°C.

Both grades can be mixed to give the hardness required.

Unit volume 800 ml (49 cu. ins.) per kilo.

Instructions for use at rear of catalogue.

Order ref.

AOO 16355 Soft Natural

AOO 16356 Hard Blue

VACUUM DEGASSING UNIT

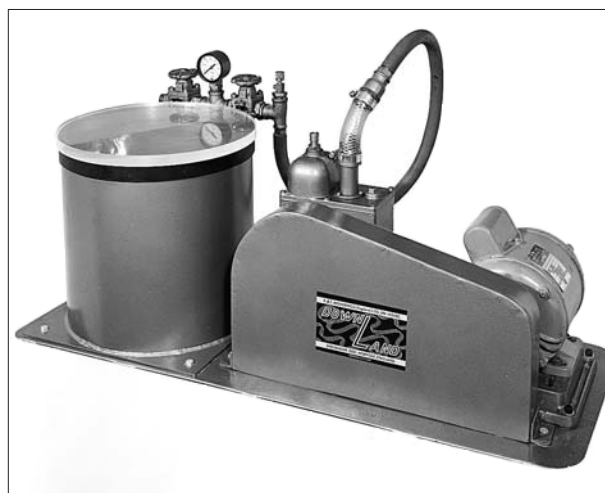
An essential piece of equipment for removing entrapped air in mould making and casting materials.

Mould making compounds such as silicone rubbers, and epoxy resins all contain entrapped air due to mixing in the hardener or catalyst and it is essential that this is removed before pouring, to ensure a perfect blemish-free mould.

Casting materials such as polyester resin, epoxy resin, etc., should also be degassed after the catalyst is added to produce good mouldings free from porosity.

The unit comprises a vacuum pump driven by a 1 hp electric motor, a cylindrical vacuum tank 12" high x 12" (304mm x 304mm) diameter with a clear perspex lid, and vacuum gauge and controls.

Order ref. AAO 17901



SECTION 13

SUNDRIES

ABRASIVE BANDS AND HOLDERS

Abrasive bands can be used for many sanding and grinding operations in the GRP workshop. They are ideal for grinding internal radii on the edges of GRP mouldings, the bands are fitted onto the pliable rubber holder and held securely in place by centrifugal force. Supplied in 25mm and 51mm sizes with bands supplied in lots of 50 of either 50, 80 or 120 grit.



ABRASIVE BAND HOLDER

Order ref.
AAO 15530 25mm AAO 15532 51mm

ABRASIVE BANDS

Order ref.
AAO 15505 25mm dia. x 50 grit AAO 15525 51mm dia. x 50 grit
AAO 15506 25mm dia. x 80 grit AAO 15526 51mm dia. x 80 grit
AAO 15508 25mm dia. x 120 grit

ACETONE

Highly inflammable, flash point - 9°C (15°F). For cleaning brushes, rollers etc., before resin has cured. To remove cured resin use methylene chloride.

Order ref. AAO 15670

ABRASIVE PAPER, WET OR DRY

Silicone Carbide 'Wet & Dry' Abrasive Paper is used for the Wet or Dry sanding of G.R.P., Paint, Laquers, Primer or Body Filler. A highly flexible yet durable product with many applications in the G.R.P. and Boatbuilding Industries.

Sheets 9" x 11" (228mm x 279mm), 25 sheets per quire. 500 sheets per ream. Grits 80, 100, 120, 180, 220, 240, 280, 320, 400, 500, 600, 800 and 1200.

Order ref.	
AAO 18020 80 grit	AAO 18026 280 grit
AAO 18021 100 grit	AAO 18027 320 grit
AAO 18022 120 grit	AAO 18029 400 grit
AAO 18023 180 grit	AAO 18030 500 grit
AAO 18024 220 grit	AAO 18031 600 grit
AAO 18025 240 grit	AAO 18032 800 grit
	AAO 18034 1200 grit

ALUMINIUM OXIDE ABRASIVE PAPER OPEN COAT

A semi flexible fast cutting aluminium oxide paper incorporating an anti-loading coating to minimise clog-ging. For use on G.R.P., Wood Filler, Metal and Paint.

Order ref.	
AAO 15553 40 grit	AAO 15556 100 grit
AAO 15555 60 grit	AAO 15557 120 grit
AAO 15554 80 grit	

AUTOMATIC DISPENSERS FOR CATALYST AND ACCELERATOR

Plastic head: 0 - 15cc and 15cc - 60cc.

Automatic dispensers are operated by squeezing the plastic bottle until the head is filled to the amount required, release pressure on the bottle, and tip contents of head out.

WARNING: Safety eye goggles should always be worn when handling catalyst.

Order ref.	
AAO 15880 0 - 15cc	AAO 15886 15cc - 60cc



BUCKETS POLYPROPYLENE

Good quality high density polypropylene buckets ideal for mixing polyester resins etc. Easily cleaned for re-using. The buckets are complete with handles and lids can be supplied if required.

2½ litre (½ gallon), 5 litre (1 gallon), 10 litre (2 gallons) and 20 litre (4 gallons).

Order ref.

AAO 17182 2.6 litre bucket
AAO 17183 2.6 litre lid only
AAO 17184 5.5 litre bucket
AAO 17185 5.5 litre lid only
AAO 17186 11 litre bucket
AAO 17187 11 litre lid only
AAO 17188 20 litre bucket
AAO 17189 20 litre lid only



POLYPROP TAPE

A resin-proof polypropylene tape with hundreds of uses in the GRP industry, refer to price list for sizes. In widths from ¾" - 2".

Order ref.

AAO 16045 ¾" wide	AAO 16049 1½" wide
AAO 16047 1" wide	AAO 16051 2" wide

7" CUTTING AND SANDING DISC

7" (177mm) diameter to fit on standard ¼" (6.3mm) arbor or rubber backing pad. Open coat non-loading abrasive with long life. Can also be used as cutting off discs.

Order ref. AAO 16064

BARCOL HARDNESS TESTER

With the advent of BS5570 and improved quality control generally in the GRP industry the Barcol Hardness Tester is coming into its own as an easy to use, simple to read hardness tester. Particularly useful for high quality mouldings such as boats, chemical tanks and fire resistant mouldings where the moulder can check before the moulding leaves his factory that it has achieved its full cure and therefore technical properties, and is ready to enter service.

The recognised way of testing the hardness, both of gelcoat and laminates. The portable hardness tester can be used in confined spaces and experience is not necessary.

The recommended method of testing a laminate is by taking 12 readings over an area. Then remove from the list of readings the highest and lowest figures and average remaining 10.

Order ref. AAO 15970



DOWNLAND SUPER POLYESTER FILLER COMPOUND

A first grade compound for all filling jobs, easily mixed, quick curing, and easily sanded, very economical if brought in the large size.

Order ref.

AAO 16298	2kg
AAO 16299	4kg
AAO 16300	Spare tubes hardener

MEGUIAR'S ULTIMATE WIPE

The Ultimate Wipe is a high quality detailing cloth that improves the quality of finish of any mould wax product. It is made from unique "Tri-core" ultra-fine fibres which are 1/100th the diameter of a human hair and completely eliminate cloth-infected swirl marks. It reduces polishing times, produces a clearer, deeper shine and is washable for reuse.

Order ref. AAO 16848

HUMIDITY METER HT3001C

To ensure production of good quality glassfibre mouldings the processing should be carried out in the correct temperature and relative humidity conditions. The HT3001C humidity meter is a simple to use hand-held tester which quickly checks conditions and produces a digital readout of both temperature and relative humidity. Laminating and gelcoating particularly should never be carried out if the relative humidity is above 70% or the temperature below 15%.

Order ref. AAO 16469

MASKING TAPE

General purpose. Stocked in widths from 1/2" - 2" (12.7mm - 50mm). Has many uses in the moulding shop.

Order ref.		
AAO 16700	3/4" wide	AAO 16702 1 1/2" wide
AAO 16701	1" wide	AAO 16703 2" wide

VINYL TAPE

Order ref. AAO 17910 2" wide

MEASURING CYLINDERS PLASTIC

Plastic measuring cylinders are suitable for measuring the catalyst and accelerators used in the GRP industry, available in sizes 10cc, 25cc, 50cc, 100cc, 250cc and 500cc.

Order ref.		
AAO 16738	10ml	AAO 16741 100ml
AAO 16739	25ml	AAO 16742 250ml
AAO 16740	50ml	AAO 16743 500ml

METHYLENE CHLORIDE

A non-flammable solvent which will soften and dissolve cured resins. It will also remove uncured resin from laminating tools, but brushes and rollers etc. must not be left soaking in Methylene Chloride as it will also soften the epoxy bond holding the bristles.

Order ref. AAO 16820

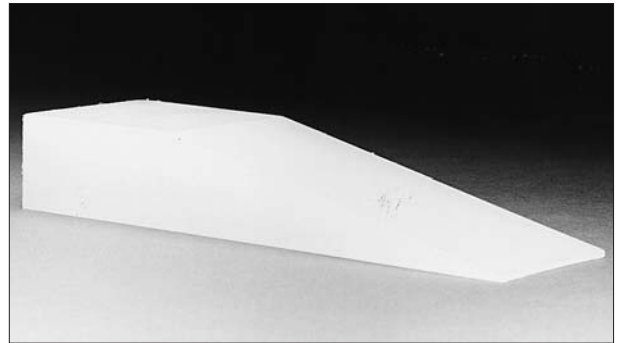
MOULD WEDGES

Strong Polypropylene Wedges for the scratchfree removal of glassfibre mouldings from moulds. Tough enough to lever with but retaining the degree of flexibility essential for removing awkward mouldings.

Order ref. AAO 18015

S P E C I F I C A T I O N

Length	150mm (6")
Width	50mm (2")
Thickness	25mm (1")



MOULDING RELEASE VALVE

The moulding release valve is a high quality stainless steel valve designed to facilitate easy release of GRP mouldings.

The valve is built into a mould adjacent to the centre, connected to an air supply and even the most awkward moulding will release without difficulty.

The moulding release valve is suitable for both hand laminating and resin injection moulds.

Order ref. AAO 16831



PALETTE KNIVES

Ideal for mixing and blending quantities of resin etc., 6", 8", 10" and 12"

Order ref.	
AOO 16890 6"	AOO 16892 10"
AOO 16891 8"	AOO 16893 12"



PAPER POLISHING CLOTH

An ultra-soft paper fabric with high tear strength ideal for all polishing applications, and considerably cheaper than rags. Packed in 5kg cardboard cartons.

Order ref. AOO 16885

PLASTICINE

For filling joints in two piece moulds, forming radii on patterns, plugging blow off holes in moulds etc., in ½ kilo packs.

Order ref. AAO 17100

PLASTIC MIXING POTS

Plastic mixing cartons are ideal for mixing small quantities of gelcoat and resin. They are tough enough to be cleaned and reused, but cheap enough to be disposed of after use. Available in two sizes 500ml and 1000ml.

Order ref.	
AOO 17178 500ml pot	AAO 17180 1 litre pot
AOO 17179 500 ml lid	AAO 17181 1 litre lid

POLISHING MOPS (FOAM)

A good quality close-cell foam polishing mop designed for applying cutting paste or mould polish and cleaner. Applies abrasive pastes easily, quickly and cleanly and produces a high class finish ready for waxing.

Available to fit either the Black and Decker LUM Polisher or the Desouter LS71200 Polisher. (Please specify machine type when ordering).

Order ref.
AOO 16310 Foam Mop 5/8" BSW Thread
AOO 16311 Foam Mop 14mm Thread
AOO 16308 Foam Mop 5/8" Drill Adaptor
AOO 16309 Foam Mop 14mm Drill Adaptor
AOO 17528 Velcro Type Backing Disc 14mm
AOO 17527 Velcro Type Backing Disc 5/8"
AOO 17529 Velcro Type Compound Head
AOO 17530 Velcro Type Polishing Head
AOO 17531 Velcro Type Lambswool Bonnet



S P E C I F I C A T I O N

Diameter 6" (150mm)

Thickness 2" (50mm)

Thread Either 5/8 Whitworth or 14mm

Also available are arbors with either a 5/8" BSW or 14mm thread to enable the foam polishing mop to be fitted into a 3/8" drill chuck.

LAMBSWOOL POLISHING MOPS

Top quality pure lambswool. 5" (127mm), 7" (177mm) and 9" (229mm) DIAMETER

Order ref.	
AOO 16600 5" dia.	AOO 16602 9" dia.
AOO 16601 7" dia.	

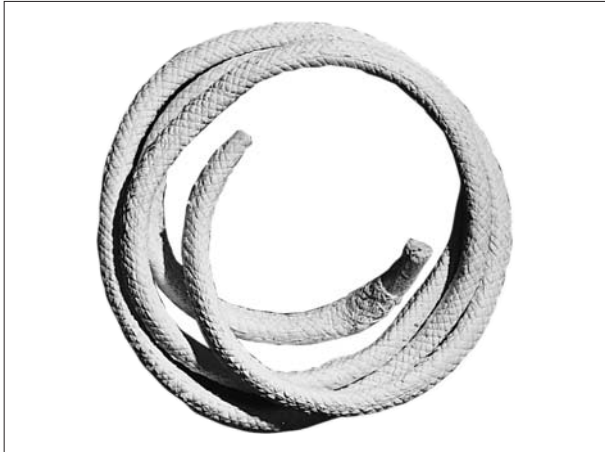
SOMRIB PAPER ROPE FORMER

The ideal method of forming stiffening ribs in moulds and mouldings. Lay Somrib over the area to be stiffened and cover with one or more layers of glass and resin.

Somrib is a paper rope of "D" section to sit flat on the moulding, a wire running through its centre holds the Somrib to any desired shape.

Stocked in 1" diameter only (25mm).

Order ref. AAO 17702



RUBBER BACKING PADS

With 1/4" (6.3mm) arbor. 5" (127mm) diameter for use with sanding discs and lambswool polishing mops. The backing pad should be fitted to an electric or pneumatic drill with a chuck speed of approximately 2000rpm.

Order ref. AAO 17506

RUBBER MALLET

Black rubber head with wooden shaft. A gentle tap with a rubber mallet will often loosen an apparently 'stuck' mould and moulding and will not cause the star cracks that a steel hammer always produces. Weight 16oz.

Order ref. AAO 17508



RUBBER RUBBING DOWN BLOCKS

Designed to hold strips of wet and dry paper or glass paper in their secure 'slot and peg' holding device. They comfortably fit the palm of the hand and as they are easy to use will increase productivity while improving the quality of work being sanded.

Order ref. AAO17510



SANDING DISCS

Aluminium Oxide, Resin Fibre backed. Available in a range of sizes and grits. 4" to 7" dia. 24-60 grit.

Order ref.

AOO 15535	100mm (4") dia. 36 grit	AOO 15547	150mm (6") dia. 60 grit
AOO 15537	100mm (4") dia. 60 grit	AOO 15549	178mm (7") dia. 24 grit
AOO 15541	125mm (5") dia. 36 grit	AOO 15550	178mm (7") dia. 36 grit
AOO 15543	125mm (5") dia. 60 grit	AOO 15551	178mm (7") dia. 60 grit
AOO 15545	150mm (6") dia. 36 grit		

SCRAPER

A scraper with 4" steel blade and smooth wooden handle. Ideal for scraping off mould flanges and mixing filler.

Order ref. AAO 16889

RACING CAR SEAT KIT

The racing car seat kit contains sufficient material to construct 1 or 2 personalised seat linings for racing and sports car seats. To form a seat polyurethane resin is poured into a bag in the car cockpit, the driver sits on the bag and the foam expands to the body shape.

Kit Contents:

- 1 x 5kg pack P.U. FOAM RESIN
- 4x polyethene bags
- 6 x 1ltr Mixing Pots
- 2 x paper overalls
- 1 x drill mounting mixer
- 1 pack disposable gloves
- 2 pieces of 1inch thick rigid foam

Order ref. AAO17161

SAFETY AND WARNING SIGNS

A large range of signs in stock for most applications. Approved by Insurance Companies and Factory Inspectors. Made of stove enamelled aluminium.

Order ref.

AAO 17579 Flammable Liquid Self Adhesive 200x200mm
 AAO 17580 No Smoking (Sign) 200 x 200mm
 AAO 17582 No Smoking (Words) 300 x 100mm
 AAO 17583 No Smoking (Words) 200 x 600mm
 AAO 17584 This is a No Smoking Area 600 x 200mm
 AAO 17585 Fire Action 300 x 250mm
 AAO 17586 Fire Extinguisher 200 x 150mm
 AAO 17587 Fire Hose Keep Clear 200 x 150mm
 AAO 17588 Emergency Exit 450 x 200 mm
 AAO 17589 Exit 300 x 100mm
 AAO 17590 Fire Door Keep Closed 80 x 80mm
 AAO 17591 Organic Peroxide 200 x 200mm
 AAO 17592 Beware Fork Lift 400 x 300mm
 AAO 17593 Eye Protection Must Be Worn 300 x 100mm
 AAO 17594 Safety Helmets 300 x 100mm
 AAO 17595 Eyewash Bottle 300 x 250mm
 AAO 17596 First Aid 200 x 150mm
 AAO 17597 First Aid Box 300 x 100mm
 AAO 17598 Flammable Liquid Self Adhesive 100 x 100mm
 AAO 17599 Organic Peroxide Self Adhesive 100 x 100mm
 AAO 17602 Respirator Must Be Worn 300 x 100mm
 AAO 17603 Masks Must Be Worn 300 x 100mm
 AAO 17601 Protective Clothing Must Be Worn 300 x 100mm
 AAO 17600 Organic Peroxide Self Adhesive 200 x 200mm



SHEARS

For cutting glassmat and cloth to size. Finest quality. Stocked in 10" (245mm) and 12" (304mm) sizes.

Order ref.

AAO 17642 10" AAO 17643 12"

10" shears are also available to suit left handed users

Order ref. AAO 17644



KEVLAR SERRASHARP SHEARS

Similar to standard shears but with a serrated edge that enables them to cut Kevlar and similar hard material with ease.

Order ref. AAO 17640

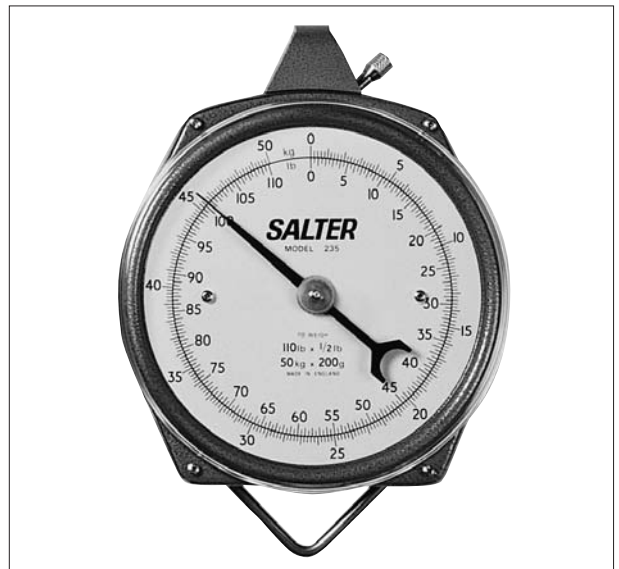
SPRING BALANCE

A useful workshop hanging balance for weighing resin, fillers etc.

Available in two sizes. Reading in kg and lb. 25kg x 100g/56lb x 4oz or 50kg x 200g/110lb x 8oz.

Order ref.

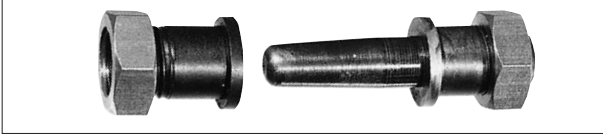
AAO 17708 25kg AAO 17709 50kg



STEEL LOCATION DOWELS

Used for locating moulds in cold press and injection moulds. Precision made, hardened steel with nuts. Peg diameter 1/2" (12.7mm). Body diameter 1 1/16" (27mm). Length of peg 1 1/2" (38mm). Supplied as a pair, one male, one female.

Order ref. AAO 17720

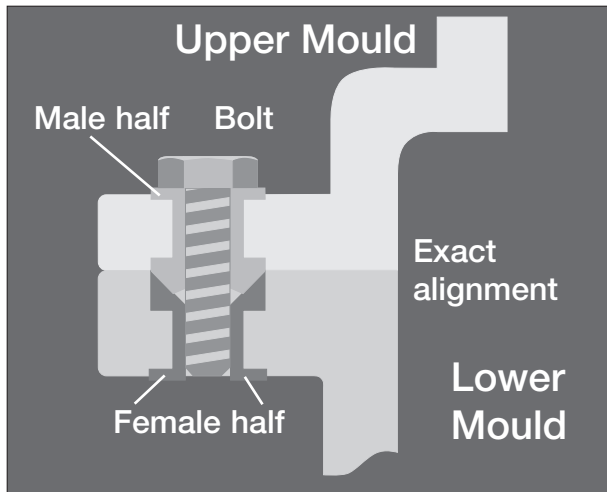
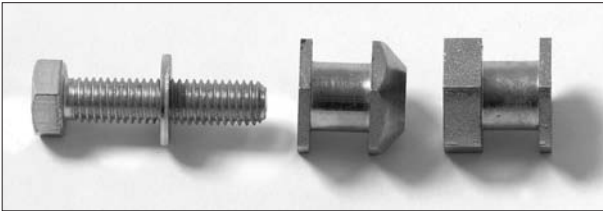


GRP MOULD CLAMP

The GRP mould clamp is a simple but very effective system for accurately locating and clamping glassfibre mould flanges.

It consists of two steel sections with matching tapers that are clamped together using an 8mm bolt.

The female threaded part should always be fitted to the lower or rear mould flange so that the bolt head is always easily accessible.



Order ref. AAO 16833 Pack of 10

S P E C I F I C A T I O N

Hexagon body across flats	20mm
Male body length	20mm
Female body length	20mm
Thread (in female)	8mm
Bolt length	35mm

We stock the above clamp as standard but other sizes are available to special order.

STYRENE MONOMER

For reducing viscosity of polyester resins. Flash point 32°C. Must be used in a well ventilated area.

Order ref. AAO 17730

STOCKINETTE (MUTTON CLOTH)

The best material for the final polishing of moulds and patterns.

Available in 28oz (800gm) rolls.

Order ref AAO 17726



MEGUIARS ULTIMATE WIPE DETAILING CLOTH

A superior quality polishing cloth made from the unique "Tri-core" ultra-fine fibres which are 1/100 the diameter of a human hair and which completely eliminate cloth-inflicted swirl marks.

Order ref. AAO 16848

TACK RAGS

An impregnated slightly tacky cloth, for removal of dust immediately before gel coating of moulds.

Size 18" x 36". Packed 10 per box.

Order ref. AAO 17750

THERMOMETERS

A mercury filled glass rod thermometer, calibrated up to 205°C for checking the melt temperature of Gelflex and Flexil.

Order ref. AAO 17755

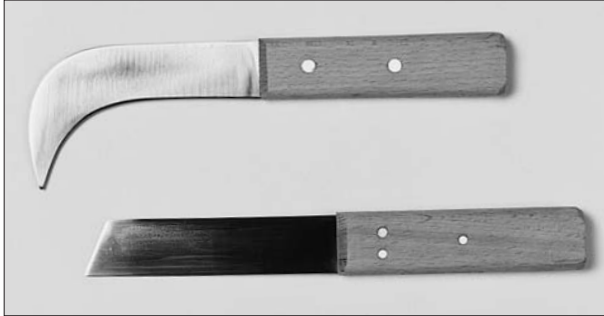
A mercury filled glass rod thermometer calibrated up to 50°C and useful for checking the temperature of resins and gelcoats

Order ref. AAO 21013

TRIMMING KNIVES, GREEN

For green trimming mouldings while still on mould and partially cured. Straight or curved blade.

Order ref.
AAO 17765 Straight AAO 17764 Curved



TRIMMING KNIVES

For cutting chopped strand mat, etc. Available with retractable or fixed blade. Supplied with five blades. Spare blades in packs of 100.

Order ref.
AAO 17760 Retractable
AAO 17766 Non Retractable
AAO 17761 Spare Stanley Blade per 100



SHEET WAX ADHESIVE COATED

Whenever it is required to add a definite material thickness to any flat or contoured surface, sheet wax is commonly used.

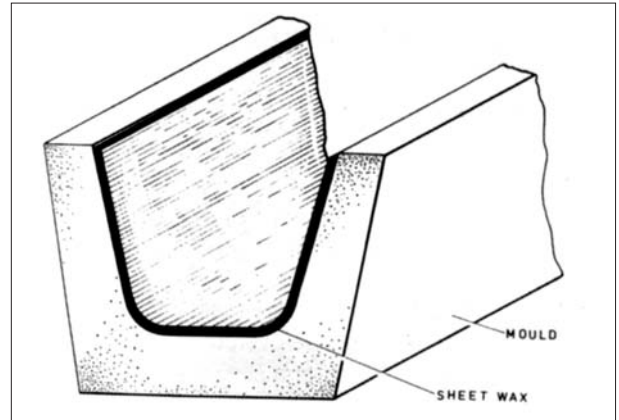
For plastic fabrications with epoxy or polyester resins, Thermo Stable Sheet Wax can be used with every assurance that its dimensional stability will not be disturbed by the exothermic reaction during the curing process of the resin.

Sheet wax is an accepted essential material used for adding component thickness to cold press and resin injection moulds. The specially formulated adhesive will hold the sheet wax to its applied surface throughout the temperature resistance range of up to

266°F, this ability to continue to adhere during the curing period is important in maintaining accurate component thickness.

In cold weather it may be necessary to temper the sheet by artificial heat until it can be applied more readily.

Firstly coat with Shellac varnish and also a P.V.A. release agent for perfect release when casting plaster or G.R.P. against a sheet wax surface. Sheet wax is packed in cartons, each sheet is 24" x 12" (610mm x 305mm) and the adhesive coating is protected by easily removed backing paper. In 29 thicknesses from 0.010" to 0.375" (0.25mm to 9.5mm).



Order ref.	Thickness	Quantity per box
AAO 18650	0.010" (0.25mm)	10 sheets per box
AAO 18651	0.015"	10 sheets per box
AAO 18652	0.018"	10 sheets per box
AAO 18653	0.020" (0.5mm)	10 sheets per box
AAO 18654	0.024"	10 sheets per box
AAO 18655	0.028"	10 sheets per box
AAO 18656	0.031" 1/32 (0.75mm)	8 sheets per box
AAO 18657	0.036"	8 sheets per box
AAO 18658	0.040" (1mm)	8 sheets per box
AAO 18659	0.048"	8 sheets per box
AAO 18660	0.050"	8 sheets per box
AAO 18661	0.060"	8 sheets per box
AAO 18662	0.063" 1/16	8 sheets per box
AAO 18663	0.070"	8 sheets per box
AAO 18664	0.080" (2mm)	6 sheets per box
AAO 18665	0.092"	6 sheets per box
AAO 18666	0.100" (2.5mm)	6 sheets per box
AAO 18667	0.110"	4 sheets per box
AAO 18668	0.116" (3mm)	4 sheets per box
AAO 18669	0.125" 1/8	4 sheets per box
AAO 18670	0.140" (3.5mm)	4 sheets per box
AAO 18671	0.158" (4mm)	4 sheets per box
AAO 18672	0.187" 3/16	3 sheets per box
AAO 18673	0.200" (5mm)	3 sheets per box
AAO 18674	0.250" 1/4	2 sheets per box
AAO 18675	0.375"	1 sheet per box

VACUUM SEALING STRIP

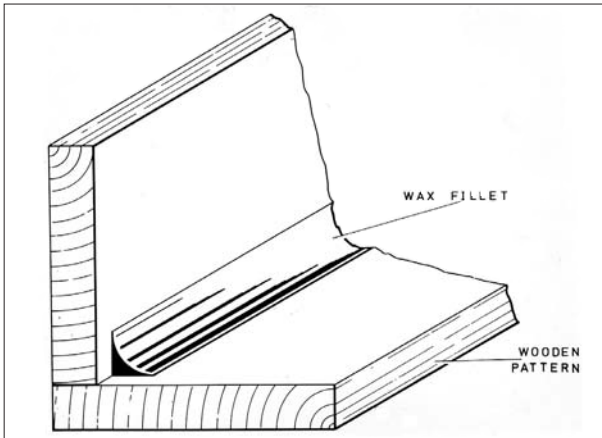
For sealing the vacuum and resin passages on vacuum assisted moulds. Size 15mm x 30mm.

Order ref. AAO 17905

WAX FILLET

Wax Fillet is the ideal material for forming radii on moulding patterns. It is true to radius and is easily applied by forming into place with warm fillet rubbers. It is self-adhering and feather edged. For good adhesion it is essential that wax and pattern are completely free from dust or other contamination. Wax Fillet does not always adhere readily to highly polished surfaces, this may be overcome by sticking the Fillet down with Bostick or a similar adhesive. For sizes available see price list.

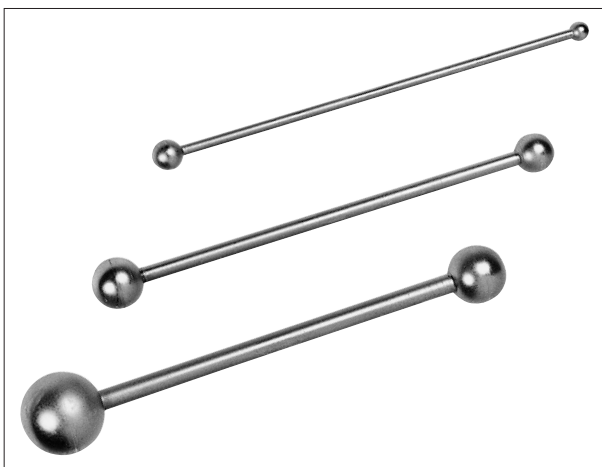
Order ref.		
AAO 18002	1/8" (3mm)	100 ft per box
AAO 18003	3/16"	100 ft per box
AAO 18004	1/4" (6mm)	100 ft per box
AAO 18005	5/16" (8mm)	50 ft per box
AAO 18006	3/8"	50 ft per box
AAO 18007	1/2"	50 ft per box
AAO 18008	5/8" (16mm)	50 ft per box
AAO 18009	3/4" (19mm)	36 ft per box
AAO 18011	1" (25mm)	20 ft per box



WAX FILLET RUBBERS

Steel shafts, brass balls, nickel plated. The essential tools for applying wax fillet.

Order ref.		
AAO 16303	Small	AAO 16305 Large
AAO 16304	Medium	



SPECIFICATION

Large

Diameter of balls	1" - 3/4" (25mm - 19mm)
To suit fillet radius	1/2" - 3/8" (16mm - 9mm)

Medium

Diameter of balls	5/8" - 1/2" (16mm - 12mm)
To suit fillet radius	5/16" - 1/4" (8mm - 6mm)

Small

Diameter of balls	3/8" - 1/4" (9mm - 6mm)
To suit fillet radius	3/16" - 1/8" (5mm - 3mm)

WIRE BRUSH

Four rows of stiff wire bristles firmly set in a smoothly shaped wooden handle. Weight - 230gm.

Order ref. AAO 18040



CSM WHEEL CUTTER

The CSM Wheel Cutter is a revolutionary new tool for cutting glassfibre mat and woven rovings. It is a light-weight hand held tool, that due to its unique cutting wheel action, will cut 8 layers of 450gm/m2 chopped strand mat with ease.

The CSM Wheel Cutter is easy to use, reduces operator fatigue and increases production. The integral wheel guard greatly minimises the risk of operator injury which is inherent in the old fashioned craft knives.

The Wheel Cutter has a high quality tungsten steel blade which has been proven to last for at least 50 hours of continuous use on chopped strand mat.

The best surface for cutting on is a polypropylene sheet.

Order ref. AAO 16434 POOO 5250 Spare Blades



SECTION 14

PRODUCT INFORMATION

HEALTH AND SAFETY AT WORK ACT

The Health and Safety at Work Act requires all manufacturers and suppliers to submit to their customers details concerning the handling and safety precautions which should be observed in the utilisation of their products.

We would like to remind our customers of the following general precautions to be taken when handling chemical material and advise that should more specific advice be required we will be able to assist.

1. GENERAL

Some of the products in this catalogue are chemicals and should therefore be subject to the normal codes of industrial practice. They should not be ingested, inhaled or allowed to contaminate the skin and eyes.

2. PROTECTION

It is recommended that full use be made of items such as overalls, eye goggles and barrier creams when handling any chemical material.

3. FIRST AID

- a. In the event of skin contact, wash the contaminated areas with copious quantities of water.
- b. Seek medical aid at the earliest opportunity.
- c. In the event of ingestion, dilute corrosive materials with large volumes of fluid, or in the case of non-corrosive materials, induce vomiting. Seek medical aid immediately.
- d. In the event of eye contact, irrigate with copious quantities of water for at least 20 minutes and seek medical aid.

4. HAZARDS

- a. Since many chemicals are readily combustible, they should be kept away from all heat sources.
- b. All spillages should be cleared up as soon as they occur.
- c. All labelling instructions should be read carefully and closely complied with.
- d. Due consideration should be given to the possibility that hazardous by-products could arise from the interaction of chemicals.
- e. Chemicals giving rise to vapours, should only be handled in areas of adequate ventilation and fume extraction.

5. SUMMARY

CHEMICALS CAN BE DANGEROUS IF NOT HANDLED WITH RESPECT and therefore it is IMPERATIVE that all employees are both adequately trained and efficiently supervised.

HEALTH AND SAFETY

Health and safety information for resin and catalysts is included in this catalogue and is available for all products requiring it. If you have not received the appropriate information for any hazardous material purchased from us please do not hesitate to request a data sheet.

The use of Mould Polishes and Cutting Pastes for Preparing and Polishing Glassfibre Moulds and Plugs.

The production of a high surface finish to reinforced plastic products begins when the plug or pattern is made.

The preparation of the plug using mould finishing material will ensure a fine surface, and therefore a good mould, and a first class finished product. Starting with the plug, whatever material it is made of, it should be finally coated with polyester sealer, or other suitable finishing material. When this is hard the surface is progressively rubbed down with wet silicon carbide papers, filling and re-coating where necessary to remove all surface blemishes, finally finishing with a 1200 grit paper. On large areas an orbital sander will speed up this job.

When a satisfactory finish has been obtained, the plug is polished with Farécla Profile 200 and then followed by Farécla Profile 400, which must be completely polished off.

Finally the plug is polished with a mould release wax, and whichever wax is used at least 3 - 4 coats must be applied, avoid excess application, apply in a thin even film, leave for 30 minutes and then polish, repeat this for 3 - 4 applications or alternatively follow instructions on can. A plug finished in this way should produce a perfect mould, provided the mould is left on the plug for several days to achieve a full cure. To refinish a g.r.p. mould the suggestions for preparing a plug should be followed.

When starting to use a new mould, again 3 - 4 coats of wax are necessary, applied in the manner detailed above, before the first lay up. Before the second moulding is taken two waxings should be made, for the third moulding one waxing is given, from this point a number of mouldings, can be made without rewaxing.

For moulds which are intended to have a long production life, particularly involving volume production of mouldings with finely detailed surfaces, the use of a semi-permanent release film such as KANTSTIK CURE FAST is highly recommended instead of wax.

The following instructions apply to all our mould preparation materials.

Stage 1

The surface must be rubbed down with progressively finer grades of wet and dry paper, ending with at least 800 grit and preferably 1200 grit paper.

Stage 2

Burnish the mould surface using Farécla profile 200 Compound. Apply sufficient compound to form a thin smear over a small area and then burnish using either a clean cloth by hand or a foam mop in a slow speed polisher until the compound has disappeared. Wash off any traces of powder with clean water before proceeding to Stage 3.

Stage 3

MO164 Machine Cleaner Heavy Duty Machine Cleaner or Burnishing Liquid is applied to the mould using an electric or air buffer at between 700 and 1500 rpm. A lambswool or foam mop is suitable for this.

This process should be continued until the surface is free from scratches and shows a high gloss.

Stage 4

Apply Mirroglaze 3 (MO364 Machine Glaze) or Farécla Profile 600 Professional machine Glaze in strips approximately 12" apart. Spread the product evenly over the mould surface (or apply to pad of orbital buffer) and continue buffing until the material breaks down.

Stage 5

MO811 Release Wax or M87H High Temp Release Wax or Honeywax, this should be applied by hand using a soft cloth. It is not possible to use a power polisher. The wax should be applied in the manner one would use to polish a car. Rub the polish over an area approximately two feet square, then polish the film surface with a new cloth. After applying wax to the entire surface polish again, sighting across the surface to check that no smears are left.

This process should be repeated at six hour intervals to give a total of three complete waxings.

Hard work is required, but the results will pay dividends.

Note

When polishing, care must be taken to remove all wax. If it is possible, a mould after waxing should be left overnight to avoid a blooming of the surface, before applying the gelcoat.

The above instructions are given as a general guide, but experience will indicate when it is necessary to re wax.

If there is any doubt whether a moulding will release easily owing to an imperfect surface or other reason, one of the Downland release agents should be used.

KANTSTIK CURE FAST TECHNICAL APPLICATION DATA FOR THERMOSET MOULDING

MOULD PREPARATION

In thermoset moulding, it is essential that the mould surface be thoroughly clean. Therefore, all traces of wax, other release agents, or any foreign materials must be removed. Kantstik Mould Cleaner will remove waxes and wax residue. It should be noted, however, that as the Kantstik Mould Cleaner breaks down the wax, it should be removed from the mould surface with clean cloths to ensure that the dissolved wax is not being spread from area of the mould to another.

Continue the process until the surface is completely clean. To test the surface for cleanliness, use a piece of masking tape on various points around the mould surface. Good adhesion to the mould should be felt when removing the tape. If not, further cleaning is necessary.

APPLICATION OF KANTSTIK CURE FAST

After the mould surface has been thoroughly cleaned, Kantstik Cure Fast should be applied either with a cloth saturated with liquid material or finely sprayed.

In either case, apply a smooth, wet film of the material. Allow approximately 10 to 15 seconds and then wipe off excess with a separate clean, dry, cotton cloth.

NOTE: Time will vary with room temperature and mould temperature. The object is to wipe off just before solvent starts to evaporate. If left on too long and the coating dries, some smearing may result when wiping off. If smearing does occur, simply remove the smears with a cloth saturated with the liquid material and proceed with the wiping operation a bit sooner.

Repeat above procedure and after a minimum of 3-5 coats have been applied, allow 20 to 40 minutes for full cure.

TESTING FOR PROPER APPLICATION

A simple test to confirm the proper application and coverage of the Kantstik Cure Fast is to attach a small piece of masking tape to a number of different areas of the mould to determine how much resistance is required to remove the tape. If the surface is treated properly, there should be very little resistance when removing the tape as compared to the same test on a clean or untreated mould surface.

TOUCH-UP COATS

Once in production, the release film will begin to wear. Rather than apply a touch-up coat once the parts begin to stick, it is better to do preventative maintenance.

For example, if trials determine that 20 releases are obtainable between touch-up coats, it is better to reapply a touch-up coat after every 15 cycles or at the end of every second shift if, for example, the moulds are being turned 8 times per shift.

The above described action will keep the moulds in production longer and help establish a routine of quality preventative maintenance.

COATING PATCH REPAIRS

Prior to repairing a patch, make sure the release is removed within a 3 to 4 inch area around the area to be repaired. Note: Semi-permanent releases must be removed with a mild abrasive as well as with a solvent wipe. If not, the patch will not bond properly to the surface and will break away.

Once the patch is cured, treat the area as a new mould:

- 1: Clean with Kantstik Mould Cleaner
- 2: Apply a minimum of 3-4 coats of Kantstik Cure Fast and cure

Touch up the patched area with Kantstik Cure Fast (one coat) every other cycle for the first 4 to 6 releases.

Remember, the patch is weaker than the rest of the mould and will require extra attention for the first few cycles.

Further, a touch-up coat (other than patch repair) should usually be done over the entire mould. This eliminates having to retouch another area that is wearing on the next cycle. However, there may be some areas of surface draft, etc. that may require a touch-up more frequently.

For example:

- Touch up complete mould every 15 cycles
- Touch up small area with bad draft every 8 cycles

The Kantstik Cure Fast is designed to blend into itself very easily and operator experience will quickly determine the number of cycles between spot and complete touch-up. For a spot touch-up, only the 10 minute room temperature cure time is needed.

Whenever the mould is stripped, reapply the Kantstik Cure Fast as described.

PRODUCT HANDLING

It is important that the materials be left in the factory containers, as the product is susceptible to moisture contamination of left open, or if the material is transferred to the wrong type of container.

The material should always be clear. If cloudiness is detected, the material is contaminated and should be discarded via proper disposal methods.

SILICONE RUBBER RTV 25C & FLEXIL S

GENERAL INSTRUCTIONS

RTV 25C with Flexil S and TIXO T1A can be used to produce flexible but tough moulds from almost any stable surfaced material, without the use of a release agent.

Mixing

RTV 25C should be carefully mixed with Flexil S in the proportions of 20:1 by weight. It is suggested that to ensure perfect mixing the 2 materials are firstly mixed in one container, then transferred to a second container and remixed, with any unmixed material in the first container being scraped from sides or base and transferred with a pallet knife.

A guide to cure times

MATERIAL	PROPORTION	POTLIFE	DEMOULD
RTV 25C+FLEXIL S	20:1	75 mins	16 hours
RTV 25C+FLEXIL S+TIXO T1A	20:1+2%	45 mins	16 hours

Note 1. 20:1 = 100g to 5g.

20:1 + 2% = 100g to 5grms + 2.1grms.

Note 2. Complete cure to full Shore A hardness will take 24 hours.

Note 3. Above times are approximate and are determined at a room temperature of 20°C (68°F).

Deaeration

To ensure the production of void-free moulds RTV 25C+FLEXIL S should be degassed under vacuum after mixing. Using a vacuum of 29"Hg. the material will expand to 4-5 times its original volume, crest and recede approximately to the initial level: a film coating along container sides will be evident above the original volume. After an additional 1-2 minutes the deaeration cycle is complete regardless of any bubbles that may be still breaking on the surface.

If a vacuum degassing system is not available, satisfactory quality can often be produced by placing the poured mould on a vibrating table or painting a thin layer of rubber on to a pattern and 'working' it with a brush for several minutes before pouring the bulk of the rubber.

Conventional Moulds

1. Stick original pattern down on baseboard.
2. Fill in any gaps between pattern and baseboard with plasticine or plaster type product.
3. Build a liquid-tight wall around pattern approx. 10-12mm away from pattern and 12-15mm higher than the highest point of the pattern to form a casting box.
4. Calculate the amount of rubber required to surround the pattern and completely fill the casting box cavity. A cavity of 100ml will require 130grms of rubber to fill it. A cavity of 20 cubic inches will require 330grms (approx. 3/4lb) to fill it.
5. Carefully and thoroughly mix together the required amounts of RTV 25C and Flexil S. Degass under vacuum or stand on a vibrating table for 10 minutes.
6. If degassing is not possible brush a thin layer of RTV 25C/Flexil S over the mould surface and pierce or brush away any air bubbles that appear over a 10 minute period.
7. Pour the remainder of the rubber into the casting box ensuring that the highest point of the pattern is covered. To minimise any air entrapment the rubber should be poured slowly in one corner of the casting box and allowed to gradually spread and flow over the pattern.
8. When the rubber has hardened (16 hours) it may be removed from the casting box by removing the walls and lifting pattern and mould from the base. The mould should then be carefully peeled back and the pattern removed.
9. The mould life will be increased if it can be left to age for 24 hours before the first casting is made in it.

10. With some large and irregularly shaped moulds it will be advantageous to build a wooden casting box that can be disassembled to remove the mould and then re-assembled to act as a frame and support for the mould.

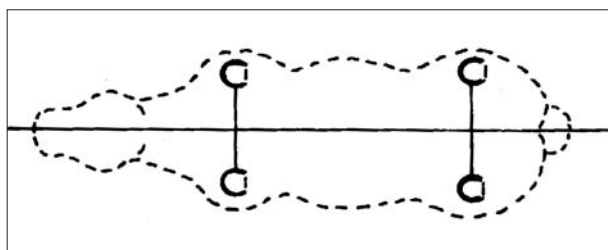
Some objects, such as a model horse standing on its four legs can be particularly difficult regarding mould making and casting. A suggested method is as follows:

A. Stick the horse down on its 4 legs using glue or plasticine. A 'light' pattern must be fastened down very securely as it will tend to float out of the liquid silicone rubber).

B. Form a casting box and proceed as numbers 3-7 above.

C. When the rubber has hardened remove casting box and mould from base and turn upside down.

D. With a very sharp knife make a central cut from horses head down to the body and to the base of tail. Then cut from centre line down to body and out to each leg. This will enable the mould to be opened up and the pattern and subsequent castings be removed with minimal difficulty.



With the mould inverted the cut should be as shown.

There are various well-publicised methods of making rubber split moulds which all involve pouring a layer of rubber, waiting for it to solidify and then pouring a subsequent layer, at least part of which will be in contact with the first layer. When adopting this type of process it is essential that any cured rubber that will have an uncured rubber in contact with it is covered with a thin film of petroleum jelly thinned with white spirits to ensure that they do not stick together.

Skin Moulding

Skin moulds are usually used to reproduce objects that are highly detailed and comparatively tall and thin rather than flat or squat. They are advantageous as there is no split mark but a disadvantage is that they usually require a split support shell.

1. Stick original pattern down on a baseboard that is at least 25mm larger all around than the pattern.

2. Fill in any gaps between patterns and baseboard with plasticine or plaster.

3. Calculate the amount of rubber needed to make the mould by working out the mould surface area in square centimetres, and allowing one gram of rubber to 3 square centimetres of mould surface for patterns up to 150mm high, and one gram of rubber to 2 square centimetres above 150mm.

4. Mix together RTV 25C, Flexil S and TIXO TA1 Thixotropic additive.

5. Degass if possible.

6. Apply the mixed rubber to the pattern surface using a brush to stipple into fine detail and a trowel or pallet knife for the bulk. The average mould thickness is 3-4mm for small moulds and 5-6mm for larger ones. A 5mm layer of rubber can be applied quite readily. If a second layer is required it should be added when the first is cured but still sticky.

7. Small moulds may be self supporting or may be supported in sand but for larger moulds the best support method is normally to make a split shell mould in glassfibre or possibly plaster of paris. A split mould has to have its split or splits on a line that will enable a rigid mould to be removed without being affected by undercuts. An obvious example is a sphere where the split would have to be on the centre line to avoid either half being undercut. To make a split shell form a flange on the pattern using hardboard, cardboard, plasticine or almost any self-supporting material and make a GRP laminate around the first part of the mould and the flange. Allow the first laminate to cure, remove flange-making material and make a second GRP laminate around the second part of the mould and pre-formed flange. When the second laminate has cured drill boltholes through the flanges and strip the separate split shells from the rubber mould. N.B. When making a GRP shell on a silicone rubber mould it is not necessary to use a release agent but it is essential that some form of release is applied both to the original flange material and the moulded GRP flange before making the second shell. When the rubber mould is removed from the pattern the shell is assembled around it and bolted together using the previously drilled holes.

8. To remove the rubber mould from its pattern or castings made in it simply lubricate the outside using French chalk or a mixture of detergent and water and turn the mould inside-out over and off the object as if removing a kitchen glove.

FLEXIL PVC HOT MELT COMPOUNDS

Flexil Hot Melt Compound is a castable material based on vinyl resin. Available in two different grades of hardness H.G. Blue, a hard grade and S.G. Natural, a soft grade. The two can be used separately or mixed together to give a range of intermediate hardnesses. It is designed for the manufacture of flexible moulds for casting polyester resin, as well as for glass fibre laminates. It has good tensile strength and is a resilient compound with a melting point of about 150°C. Moulds from Flexil give faithful reproductions of the model; rough surfaces will reproduce rough, while glossy or polished surfaces will leave the mould face with original degree of gloss or polish. Flexil moulds allow greater versatility in design, either functional or decorative, because the extraction problems associated with rigid moulds are not present.

Moulds can be washed with soapy water to remove dust or the remains of previous castings - the oily

surface makes it unnecessary to treat moulds before casting since it acts as a mould release, but care should be taken to avoid the excessive use of strong detergents which may remove the oil film. Organic solvents should not be used to clean a mould since even if they do not dissolve the compound, they may be taken up in small quantities causing the mould surface to swell and distort. When Flexil moulds are fitted in plaster cases for storage, the inside of the case should be coated with a solution of shellac to prevent the plasticizer to the Flexil form being absorbed by the plaster case.

Remelting

When a mould is damaged or worn out it is cut up and pieces inspected for cleanliness - dirt can be washed off without affecting the Flexil compound. After any necessary cleaning the material is ready for re-melting and re-use. Flexil can be re-melted 25 - 30 times before it loses its elasticity.

Methods of Melting Small Quantities

Small quantities of Flexil can be melted in an air bath similar to a glue pot or porringer but without water or oil in the other vessel, since boiling water is not hot enough to melt the compounds. When using this device the contents must be stirred frequently, and only quantities of up to 5lb (2.2kg) can be melted. The Flexil should be cut into small pieces and a small quantity placed in the tin, the compound being stirred while being heated. When the first charge begins to liquify, a further few pieces should be added with further stirring; this procedure should be repeated until all the hot melt compound has melted.

Melted Larger Quantities

A range of melting appliances designed for use with Flexil Hot Melt Compounds is available. All are electrically heated and thermostatically controlled, and are the safest and most efficient means of melting the material without danger from over-heating and burning. This controlled heating results in the life of Flexil being increased by up to 40%. Models of 5, 12 and 20 gallons (22.7, 54.5 and 90.9ltr.) capacity (50, 120 and 200lb (23, 44 and 90kg) Flexil respectively designed for users of large quantities of Flexil, are fitted with a quick melting device making it possible to melt about 35lb (16kg) of Flexil an hour.

Mould Making

A model of almost any rigid material can be used provided it does not soften at the melting point of the compound - thermoplastic resins are therefore unsuitable. Porous materials such as dry plaster of paris and wood, should be sealed or otherwise treated to prevent entrapped air escaping and marring the mould by bubble formation. Bulky metal parts should be warmed to counteract any chilling of the Flexil.

China and glass objects should be carefully warmed beforehand to prevent breakages when the hot compound is poured over them. Cement or cast stone objects, which are usually large, are best used water wet. They should be soaked for several hours, dried superficially and used as masters without preparation.

Open or Flood Moulds

Open or flood moulds are very simple to make; the model, provided it is in low relief as a panel, can be moulded in the following manner. The panel is laid on a flat surface and a retaining wall of clay or wood built round it an inch higher than the highest point of the model. Flexil is then poured between the wall and the model in a continuous stream to avoid trapped air and splashes.

Pouring a Mould

When all the material has melted to a thin liquid, the Flexil should be poured quickly into the mould box, without stopping, until it is filled to the top. Care should be taken not to pour on to the model. The stream should flow down the side of the encasement to avoid splashing and trapping air. The danger of premature gelling during pouring is not very great, and slightly gelled Flexil will still give excellent reproduction. Checking the temperature with a thermometer reading to 200°C is recommended as this will help to prevent the compounds being poured above their recommended temperatures.

Treatment of the Mould

If the mould is faulty, owing to blemishes on the master, or air, which has come out of the model, it can be repaired by touching up with a hot knife. A tear in the mould can be repaired by the same method.

INSTRUCTIONS FOR THE USE OF METALLIC JEWELS IN G.R.P. MOULDINGS

The most attractive appearance of Metallic Jewels is when they appear to glitter from behind a shiny glass-like surface, with a completely random orientation of the individual particles. It is therefore preferable to have a very good finish in the working mould to help obtain the best surface gloss on the resultant moulding.

A thin layer of clear, unpigmented gel coat should preferably be applied evenly to the mould and allowed to cure. The more evenly it is applied, the better. This gelcoat helps to provide a deep gloss, and in applications where cost is critical, can be dispensed with, although a less impressive finish will be obtained. The Metallic Jewels are then mixed into a further clear thixotropic gelcoat resin, at a loading of around 12.5% by weight (i.e. 1lb Metallic Jewels per 8lb of gelcoat). This gelcoat should be applied to the mould in such a way that the Metallic Jewels are evenly distributed. Certainly the best (and quickest) method is spray application, but if no spray equipment is available, the gel coat can be 'stippled' on, taking care to ensure that the particles are distributed in such a way that they do not follow and hence show up brush marks. It is worth mentioning that if this coat is applied by brushing in the normal way, the Metallic Jewels will lie down in the direction of the brush movement and the resultant colour effect will be comparable to that of a grass lawn mown in different directions; the 'stippling' is therefore necessary to destroy this effect which would give a very false and displeasing finish.

The gelcoat thixotropy is important to hinder settlement of the Metallic Jewels and avoids 'runs'.

Nevertheless, the Metallic Jewels may still settle in the mixing pot, so regular stirring is necessary. When applying by a spray gun which has the resin pot mounted in the gun, two ball bearings dropped in the pot will maintain dispersion if the gun is shaken regularly during application.

When the Metallic Jewel coat has been applied and allowed to cure, lay up can proceed in the normal way. However, the laminating resin should be pigmented in a colour to match the Metallic Jewels in the gelcoat. This pigmentation is important, and provides a 'back-up' to the Metallic Jewels in the small areas where the Metallic Jewel particles have not given coverage (namely, between the individual particles).

An exact colour match for the laminating resin pigment is unnecessary (and anyway, virtually unobtainable). If, for instance, Royal Blue (15E) Metallic Jewels are used, a blue pigment should be chosen for the back-up resin, in a colour as near to the Metallic Jewel Royal Blue as possible. If a choice has to be made between a paler blue than the Royal Blue (15E) or darker than it, the darker one should be used, as this causes the Metallic Jewels to 'stand out' better. It is not necessary to use polychromatic colours for backing-up in the laminating resin. The leading suppliers for polyester pigment pastes can normally recommend a suitable colour to match Metallic Jewels.

Should any difficulties or queries arise, do please contact us, when you can be assured of our very best attention and efforts to assist.

N.B. Our Polycon Gelcoat Spray Gun is particularly well suited to the application of metallic jewels. Please see page number 10 for details.

INSTRUCTIONS FOR USING POLYCORE

1. Polycore may be used in hand lay-up or spray-up techniques using conventional equipment.
2. Polycore should be cut to shape using scissors or knife.
3. After waxing the mould, gel coat is applied in the normal way and left to gel.
4. Apply resin to the mould.
5. Position the first layer of chopped strand mat.
6. Saturate the glass mat with resin and roll out thoroughly.
7. Apply additional resin onto the rolled out mat layer and position the Polycore onto the wet resin.
8. Add resin from the top surface to complete the wetting out process and roll out.
9. Polycore should be butt-jointed and after saturation, will stretch to form a neat joint.
10. It is vital to fully wet out the Polycore. (See product data sheet for resin consumption figures).
11. It is impossible to over wet Polycore, as the excess resin will flow to the surface and can be absorbed by the next layer of glass mat.

DO'S AND DON'TS WHEN USING POLYCORE

Do's

1. Pre-cut Polycore to fit the mould.
2. Calculate the amount of resin to be used for the Polycore. (See product data sheet for details).
3. Ensure the Polycore is fully wet out.
4. Apply a layer of glass mat on top of the Polycore before the resin cures.
5. Up to three layers of Polycore may be placed directly on top of each other - reduce catalyst levels to avoid a build-up of exotherm.

Don'ts

1. Never place Polycore against the gel coat layer.
2. Do not use Polycore as the final layer in a laminate
3. Keep solvents such as acetone and methylene chloride away from Polycore, as this will inhibit the cure.
4. Do not overlap Polycore, but pre-cut to butt join.

STORAGE OF POLYCORE

1. Keep Polycore dry at all times.
2. Store away from direct heat.
3. Store Polycore rolls vertically to avoid compressing the product and so affecting thickness.

THE USE OF 32032-00 CLEAR CASTING RESIN

32032-00 Clear Casting Resin is used to make clear castings which may also encapsulate small items such as coins and flowers.

To get the best clarity it is essential that moulds and mixing and measuring equipment are kept perfectly clean. As the curing of 32032-00 will vary dependent upon age of resin, volume of casting, and ambient temperature we suggest that before encapsulating a valuable object tests should first be carried out using identical conditions and resin from the same batch.

DOWNLAND LATEX RUBBER

A SUGGESTED PROCEDURE FOR MANUFACTURING RUBBER MOULDS FOR CASTING POLYESTER ORNAMENTS

The basic model used for moulding with latex rubber should be made from a good quality plaster of paris. The plaster model should have a plaster base with a minimum thickness of 13mm. If the base is not made at the same time as the model then a base may be added to the model by using the following procedure:

Make a circular plaster disc to a minimum thickness of 13mm. Drill a hole through the centre of the base and fix by a screw. Gaps between the master model and the base should be filled using a cellulose filler such as Polyfilla. Plaster must not be used for this operation. The complete master model plus base should now be dried thoroughly. The model should then be placed in an oven at a temperature of approximately 80°C, until the model is just handleable. The model is then lowered BASE FIRST slowly into the

latex compound. This can be achieved by standing the model on an aluminium tray supported by aluminium stainless steel or nylon rods or wire. The model is left completely immersed for a minimum, dwell time of 2 hours. The approximate thickness of latex deposited is as follows:

DWELL TIME	THICKNESS
2 hours	1.6 to 2.4mm
3 hours	3.2 to 4mm
4 hours	4mm to max.

Whilst the plaster model is immersed in the latex, it is advisable to cover the container. This will help prevent skinning of the latex as well as preventing dirt or dust settling on the surface.

When the necessary dwell time has elapsed, the mould should be slowly and evenly withdrawn from the latex. As a guide the withdrawal rate should be approximately 50mm every four seconds. The mould should then be left to air dry in its natural standing position for at least two hours, when the rubber should be 'touch dry'. The mould should then be placed in a drying oven at a temperature of approximately 30°C for a minimum of three hours.

When dry the mould should be dusted with talc or a weak detergent/water solution, and stripped from the plaster model. If the mould is reasonably small, it can be immersed in a sand-filled container, to prevent any distortion when the polyester is poured in. For large moulds it is recommended that a case is made for the mould out of fibreglass or similar material. This should be constructed in two halves to facilitate removing the complete rubber mould and polyester ornament.

Storage Recommendations

Stored in well-sealed containers, Downland Latex Compound will keep satisfactorily for at least six months. The latex must be protected from frost and should preferably be stored at a temperature above 5°C (41°F), but not above normal ambient temperatures.

The latex must never be contaminated with copper or copper-bearing alloys. Latex contaminated in this way will age rapidly and the compound's usable life will be seriously impaired. Copper or copper-alloy machine components should be chromed or exchanged for non-cuprous replacements.

SIMULATED METAL SURFACES (Cold Cast Metal)

Polyester resins and finely ground metal powders can be combined to produce very realistic simulations of metal castings. The basic requirements for successful casting are extremely simple but tend more to be an artistic process rather than an engineering discipline.

The best, most realistic effects are obtained by mixing as much metal powder as possible into a gelcoat/resin mixture but from an economics point of view the normal mixture for copper based metals is 3 parts metal to 1 part resin by weight.

Moulds

Many castings will have undercuts and therefore require the use of flexible moulds which can be made from silicone rubber, latex rubber or PVC compounds, while rigid GRP moulds can be used if undercuts are not present.

A SUGGESTED CASTING PROCEDURE

1. Calculate quantities required. Allow 600-1000 grams gelcoat/resin per M² and allow 1800-3000 grams metal per M²
2. The viscosity of the gelcoat determines the amount of metal that can be combined with it and the ease with which the gelcoat/metal mixture can be brushed into the mould surface detail. A good compromise is to make a gelcoat/resin mixture by combining equal parts of gelcoat and non-waxed laminating resin.

e.g.

500 grms GB120H Gelcoat	} Mix with 3000g metal powder
500grms 440-700 Resin	
20ml M50 catalyst	

The mixture should be applied to the mould surface by brush taking care to thoroughly brushout and stipple into any surface detail. The gelcoat/metal mixture should be left for 30-90 minutes to cure.

3. The cured gelcoat should be reinforced either by a resin/filler mixture or a glassfibre laminate.
4. When the casting/laminate is fully cured and removed from the mould it will require polishing by firstly rubbing gently with fine (00000 grade) steel wool to remove the outer skin of resin and then buffing with fine metal polish.
5. If a 'bright' finish is required the exposed metal surface should be wax polished.
6. If an oxidised or verdigris finish is required it can be obtained by an acid treatment: place the casting in the open air, cover with a polythene tent and place a saucer of sulphuric acid beneath the cover.

Gelcoat Repairs

Unfortunately even the best quality G.R.P. moulding will occasionally suffer from a hole in the gelcoat where the reinforcement was incorrectly applied.

These holes are very difficult and probably impossible to repair so that they are completely invisible, but we feel that the following notes will enable the best possible result to be obtained.

1. Carefully remove all loose gelcoat with sharp scraper or pricker.
2. Wash out the hole with a perfectly clean brush wetted with perfectly clean acetone. DO NOT subsequently touch the hole as natural oils from the skin will cause a black ring to appear around the edge of the hole.
3. Make up a gelcoat mixture using exactly the same pigment and catalyst percentages as was used for

the original gelcoat. To simplify accurate pigment and catalyst % addition we suggest a mix of at least 100grms.

N.B. If just a small amount of gelcoat is used and catalyst added by guesswork the probable over-catalysing will result in a green tinge.

4. Do not put the gelcoat mixture straight into the hole to be repaired as small pinholes will result - brush out the gelcoat on a sheet of polythene and rebrush at 90° to the first strokes and then scrape up the brushed out gelcoat and apply it to the repair.

5. Slightly overfill the hole, allow the gel to fully cure and then carefully rub down and repolish.

INSTRUCTIONS ON GLASSFIBRE MOULD MAKING

Hand Lay-Up

Hand lay-up is the oldest and simplest method for producing glass reinforced structures from polyester resins and is also very frequently used for making the mould itself from the original master pattern. The mould can be male or female depending on the specific requirements of the article to be moulded, the important factor being that the surface of the moulding which comes in contact with the mould will be smooth, giving not only a better appearance, but improved resistance to weathering or chemical attack. A moulded outer surface, as obtained with a female mould is clearly preferable for articles such as boat hulls or motor car bodies, whereas a smooth interior surface as provided by a male mould is required for storage tanks or pipes. A female mould is preferred for the majority of general purpose mouldings.

Making the pattern

The pattern is essentially a reproduction of the article which is to be manufactured and can indeed be an example of the article itself made from another mould. It is usually made individually from more easily workable materials which would not withstand the repeated usage required of the mould. When designing the pattern, it is important to remember that a shape allowing easy removal of the mould will in turn give a mould permitting easy removal of finished mouldings. For this reason, a taper of 1° - 1½° is desirable on vertical faces and undercuts or sharp corners should be avoided whenever possible.

The materials commonly used in the construction of patterns include wood, sheet metal and plaster of Paris. Before a mould can be made from the pattern, the surface must be sealed to prevent absorption of polyester resin by any porous materials. This is usually achieved by application of seven or eight layers of a sealer and, when this is dry, sanding and wax polishing the surface to give a smooth, glossy finish.

Making the Mould

Mould release agent No. 3 is first applied to the pattern. It is important to avoid streaks or bare patches since these will show as marks on the surface of the

mould and application of the release agent by spraying or by means of a sponge, rather than with a brush, will probably give the best results. **RELEASE AGENT MUST BE ALLOWED TO DRY.**

The next stage in preparing the mould from the pattern involves the application of a layer of gel coat resin. This will give a surface on the mould free from glass reinforcement and reproducing the glossy finish of the pattern. It is often desirable to colour this gel coat so that when the final mould is in use, it will be easy to see if thin areas are present as gel coat is subsequently applied when making a moulding. Catalyst is added to the gel coat resin at the rate of 2% (20 cc per kilo of resin) which is then brushed on under dry conditions and preferably at a temperature of 18°C - 20°C.

About 600 - 700 gm/m² will give a suitable thickness of gel coat.

When the gel coat has cured sufficiently, usually after 2-2½ hours, a thin coat of general purpose lay-up resin is applied to the mould followed by a glass surfacing tissue, ensuring that there are no voids between this tissue and the gel coat. The resin is allowed to gel and the first layer of chopped strand mat (300g/m² or 1oz/ft²) is then applied together with sufficient lay-up resin to give a resin/glass ratio of 2 : 1 and 2½ : 1, any trapped air being removed by use of a paddle roller. Where two faces meet, the glass will tend to bridge the corner and should be cut and joined to ensure that this does not occur. When impregnation has been completed satisfactorily and all air removed, the resin is left to gel and cure overnight.

On the second day, a layer of thicker glass mat (450g/m² or 1½oz/ft²) and resin is applied with similar precautions and again allowed to cure overnight, followed by a further layer on the following day. When this has cured, the mould can be built up to the required thickness with the bulk of the resin and reinforcement, the amount used depending on the intended life of the mould. To ensure that the mould will not distort during removal from the pattern or in subsequent use, stiffeners are incorporated where necessary. These usually consist of shaped pieces of wood, the areas which they are to cover being previously wetted with resin and covered with a layer of glass reinforcement. When the stiffeners are in position, the resin retaining them is allowed to cure overnight and next day they are completely covered by a layer of resin and glass mat, so as to completely enclose the wood, thus preventing any change in its moisture content which could otherwise cause warping. As soon as this resin has cured, the construction of the mould is complete, but, for the best results it should be allowed to remain on the pattern for another three or four days. Care should be taken in removing the mould from the pattern. Wedges of a fairly soft material such as wood can be used and when removal is difficult, it is helpful to introduce water between the mould and the pattern to dissolve away the release agent. When released from the pattern, the mould should be carefully inspected for any minor blemishes and repaired where necessary before being put into service.

INSTRUCTIONS ON GLASSFIBRE MOULDING

Before the mould is used, the surface should first be washed to remove remains of the release agent and then coated with Honeywax or Diamond wax and thoroughly polished, three or four treatments being necessary. For the first few mouldings, release agent No. 3 should also be applied, but after several mouldings have been removed, this treatment becomes less essential, provided that the use of wax polish is maintained. See instructions on use of mould polishes and release agents.

When the release agent has dried, a gel coat resin can be applied. The gel coat forms the surface of the final moulding and consists of a layer of unreinforced, fairly flexible polyester resin which performs a variety of functions. In addition to preventing the protrusion of glass fibres from the moulding surface, the gel coat provides a smooth, resilient coating which can be coloured and which provides improved protection against weathering or chemical attack. General purpose gel coat resins are pre-accelerated and are always highly thixotropic, in rather the same way that modern non-drip paints are thixotropic, so that their application to vertical or inclined surfaces is not followed by drainage. Gel coat resins are coloured by adding a suitable quantity of the appropriate colour paste. The amount of colour paste added may be up to 10% by weight on the gel coat and must be thoroughly mixed to ensure even distribution. At the same time, it is necessary to avoid the introduction of air bubbles which could show up as pinholes in the surface of the finished moulding, a folding action often giving the best results in this respect.

The catalyst is added after the colour paste, at the rate of 2%, and is mixed in thoroughly in the same way, so as to avoid the introduction of air bubbles. The catalysed gel coat resin is applied to the mould surface by means of a soft brush, but since the object is to obtain uniform coverage by applying only one fairly thick layer of gel coat, the material should be spread on the mould and not brushed out, a 'painting' action being avoided. The final cured gel coat should have a thickness of about 0.4mm (0.015") corresponding to the application of 600 g/m² (2 oz/ft²).

Provided that the curing conditions are satisfactory, with the temperature exceeding 15°C (59°F) and the humidity low, backing up of the gel coat can be commenced between one and two hours after its application. This period will however, be longer in some circumstances, when, for example, the design involves deep cavities where air circulation is restricted and curing of the gel coat is consequently much slower. Inversion of the mould sometimes helps on such occasions. The backing up process involves the successive application and impregnation with polyester resin of several layers of glassfibre. Chopped strand mat (CSM) is almost always used, although several other types of glass reinforcement are available, including woven glass cloth, for example, which are employed for special applications.

Chopped strand mat (CSM) is produced in several different weights, those commonly available being 300,

450 and 600 g/m² (1, 1½ and 2oz/ft²) surface tissue or 300g/m² CSM is often applied directly behind the gel coat, because it is essential to ensure that all trapped air is removed and that no voids, such as those produced by the bridging of corners with glass fibres, are present between the gel coat and the back-up layer.

In the later stages, a heavier weight of glass mat can be employed to achieve a rapid build-up in the thickness of the moulding, using sufficient polyester resin to give an overall resin/glass ratio between 2 : 1 and 2.5 : 1.

1% of catalyst is added to the resin and is applied generously to the back of the cured gel coat and the first layer of previously tailored glass mat is laid over the resin. Impregnation of the glass mat with resin is then achieved by rolling, so as to bring the resin through the glass and remove air at the same time. Full impregnation of the glass mat with resin is best achieved by the use of spiral bristle or paddle rollers.

During the laminating process, it may be necessary to apply more resin to the upper surface of the mat but it is always preferable to apply plenty of resin first and bring it up through the glass. Forcing of resin into the mat from above is always liable to introduce unwanted air bubbles. When a coloured gel coat has been used, it is better to colour the first application of backing resin to the same shade because this will assist in concealing any variations in the thickness of the gel coat.

When the first layer of glass mat has been fully impregnated, further layers of resin and reinforcement are successively applied using the same technique, but for thick mouldings it is necessary to proceed in stages, allowing the resin to cure after each stage. The reason for this is that a thick layer of reinforcement, fully impregnated with liquid resin will become unmanageable and the whole laminate will tend to move on the mould surface during consolidation. A further factor to be borne in mind is that considerable heat can be evolved as resin cures due to the 'exotherm' and if this is excessive, warping and discolouration of the moulding can occur and even damage the mould.

At any stage in the moulding process when operations are suspended or when a change from gel coat resin to lay-up resin or coloured to uncoloured resin is made, the brushes and rollers should be washed thoroughly in acetone to remove any surplus resin before this has gelled.

After lay-up of the moulding has been completed, but before final curing has taken place, the laminate can be 'green trimmed' with a sharp knife. If this is not practicable, other trimming techniques can be employed on the cured moulding after extraction from the mould. These include the use of hacksaws, files and diamond wheel trimmers.

As already mentioned an 'exotherm' occurs as the polyester resin cures and all the heat generated in this process should be allowed to dissipate before the moulding is removed from the mould. It is preferable to allow the moulding to mature for several hours and even better to leave it overnight at this stage. When fully matured, the moulding is extracted using techniques similar to those described for removing the mould from the pattern, any trimming needed being carried out soon after extraction.

Fault Finding and Remedies

Many thousands of G.R.P. mouldings are produced every year, most of them without problems, but the process involves a chemical reaction, and the departure from the recommended conditions may lead to faulty mouldings. This section offers a guide in tabular form to the faults most likely to be encountered in G.R.P. moulding and to the remedies likely to be effective in overcoming them.

Many of the problems encountered in G.R.P. production can be traced to undercure of the polyester resin

often due to damp operating conditions or low workshop temperatures. It is important to ensure that the workshop temperature does not fall below 15°C (59°F) and that the humidity is not excessive. The occurrence of rejects is often associated with congested working conditions. It is, for example, almost impossible to produce high quality mouldings in a workshop where the laying down of gel coats and trimming or sanding operations, leading to dusty conditions, are being carried out simultaneously.

Fault	Possible causes	Suggested remedies
Wrinkling, rippling or orange peel effect	Undercure of gel coat	I Check catalyst addition and efficiency of mixing II Apply thicker film of gel coat III Avoid operation under cold, damp conditions
Blistering	(a) Air trapped between gel coat	Apply generous layer of resin over gel coat so that on laying up air is forced through the glass mat and lay-up
	(b) Contamination with water or solvent	Ensure complete removal of cleaning solvents or water, from brushes and rollers
Fish eyes (lace curtain effect)	Gel coat not wetting mould adequately	I Avoid use of mould waxes or polishes containing silicone. II Use No. 3 release agent
Colour streaking	Separation of components of colour system	I Check mixing of colour pastes II Check colour paste recommendations with supplier III Consider spray application
Fibre pattern	(a) Gel coat too thin	Ensure even and adequate gel coat
	(b) Gel coat undercured	I Avoid applications under cold, damp conditions II Allow adequate time for hardening a gel coat before commencing lay-up
	(c) Premature extraction of moulding from mould	Ensure adequate cure of moulding before extraction
Pinholing	(a) Air bubbles trapped in gel coat film	I Avoid beating air into gel coat when adding catalyst or colour paste II Lay gel coat with light, even strokes and avoid stippling action
	(b) Dust particles on mould surface	Remove all traces of dust before laying gel coat
Flaking gel coat	Faulty adhesion between gel coat and lay-up	Avoid leaving gel coated mould for longer than 12 hours before applying lay-up
Star cracking	Impact on reverse of laminate	Gel coat too thick
Sink marks	Shrinkage over rib or insert	Allow laminate to cure partially before moulding in ribs or inserts
Distorted or discoloured areas	Excessive exotherm	I Adjust accelerator/catalyst system
		II Reduce thickness laid up at one time (use lighter CSM and more layers)

Fault	Possible causes	Suggested remedies
Delamination	(a) Insufficient resin (b) Poor wetting-out of glass mat }	I Ensure even and adequate resin application II Roll more carefully
Poor hardness and low rigidity	Undercure	I Check catalyst addition II Avoid laying-up under cold, damp conditions III Ensure that glass mat is not stored under damp conditions
Tacky reverse surface (milky white film on exposure to water)	Undercure of surface exposed to air	Use resin with wax additive for final coat
Distortion	Shrinkage in large, flat areas	I Ensure that ribs incorporated in moulding are adequate II Make sure that cure is adequate before removing laminate from mould or former III Balance gel coat by applying resin rich layer to reverse side of moulding IV Modify mould design to compensate for bowing of moulding

Catalyst or Accelerator Additions

Resin		½%	1%	1½%	2%	3%
Kg.	g.	Millilitres (Cubic Centimetres)				
50		0.25	0.5	0.75	1	1.5
100		0.5	1	1.5	2	3
150		0.75	1.5	2.25	3	4.5
200		1.0	2	3	4	6
250		1.25	2.5	3.75	5	7.5
300		1.5	3	4.5	6	9
350		1.75	3.5	5.25	7	10.5
400		2.00	4	6.00	8	12
450		2.25	4.5	6.75	9	13.5
500		2.5	5	7.5	10	15
1		5	10	15	20	30
2		10	20	30	40	60
3		15	30	45	60	90
4		20	40	60	80	120
5		25	50	75	100	150

Pigment Additions

Resin		2%	4%	5%	6%	8%	10%
Kg.	g	Grammes					
50		1	2	2.5	3	4	5
100		2	4	5	6	8	10
150		3	6	7.5	9	12	15
200		4	8	10	12	16	20
250		5	10	12.5	15	20	25
300		6	12	15	18	24	30
350		7	14	17.5	21	28	35
400		8	16	20	24	32	40
450		9	18	22.5	27	36	45
500		10	20	25	30	40	50
1		20	40	50	60	80	100
2		40	80	100	120	160	200
3		60	120	150	180	240	300
4		80	160	200	240	320	400
5		100	200	250	300	400	500

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