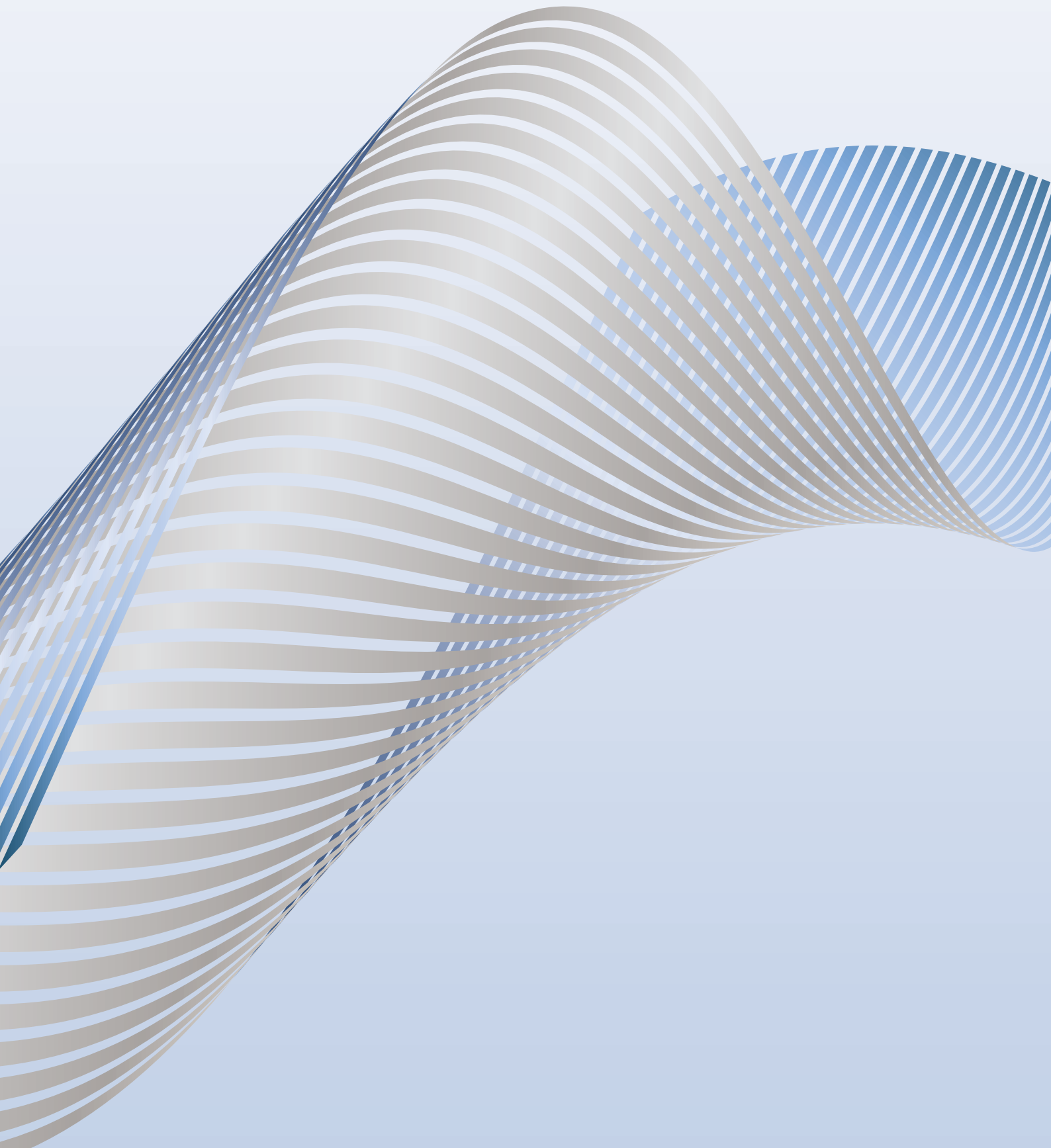


# CR CLARKE

TECHNOLOGY FOR TODAY'S PLASTICS





C R Clarke and Co has been developing and manufacturing thermoforming and plastic fabrication equipment for over 30 years. In that time we have developed a wide range of solutions for bending, vacuum forming, polishing and processing thermoplastic materials of many types.

Our experience, coupled with modern manufacturing techniques and machinery, ensures that all products are made to a high standard, and are suitable for use in both educational and commercial situations.

Products are distributed worldwide from our manufacturing base in Wales, United Kingdom, and we also have a network of distributors providing local support in many parts of the world.

We are always happy to talk to anybody looking for equipment or just friendly advice on equipment selection or applications. We can also offer an on-site service for customer training, support and equipment maintenance.

We trust that you find our catalogue to be useful, should you have any questions please don't hesitate to contact us.

**Maurice Clarke** Managing Director

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## THE PROCESS

A piece of thermoplastic material is locally heated along a straight line. As the material reaches its softening point, it creates a natural hinge, allowing it to be folded with little resistance. The material is held in the required position, either by hand or in a cooling jig, until it cools and becomes rigid again.

A wide range of materials can be processed using line bending, including acrylic, PVC, polycarbonate, polystyrene, ABS, PVC, PETg. Material thickness can vary from 0.25mm for badges and ticketing, to over 25mm material for designer furniture and acoustic barriers.

### Applications

Line bent plastic products are used in a massive array of industries, including:

- Point of Sale Display items – leaflet holders, display stands, sweet dispensers
- Supermarket price ticketing systems and checkout counters
- Industrial tanks for chemicals and water
- Roadside noise reduction panels
- Shock absorbing supports for railway sleepers
- Machine guarding and fascias



## OUR PRODUCTS

We have developed a range of solutions for plastic line bending on materials from 0.25 to 25mm in thickness. Our machines use tensioned, low voltage resistance wires to produce a very precise and even band of heat.

The machines range from single wire units with heating from beneath only, to multi-wire, double-sided heating machines for short cycle times and thicker materials.

Contact heating foils are available for many of our hot wire strip heaters, and can be useful for folding materials under 1mm in thickness.



## ELITE RANGE

The Elite range of Hot Wire Strip Heaters has been developed to meet the exacting requirements of the modern plastic fabricator. Available in four working lengths, 1250mm, 1825mm, 2450mm and 3050mm, the standard machine comes with one heater beam. This can be expanded to a maximum of six heater beams, allowing multiple bends to be processed in a single operation.

Each Heater Beam incorporates 8 individually tensioned heating wires, 4 below and 4 above the material to be heated. Heating wires are fully adjustable for spacing and height, enabling materials from (typically) 1-25mm to be heated. For larger radius bends heater beams can be brought together, forming a large uninterrupted heat band.

A 160mm spacing between the upper and lower beams allows easy material loading. At the start of the heating cycle the upper beam lowers onto the material, applying the upper heat and also clamping it. At the end of the heating cycle the upper beam raises, allowing the material to be removed and folded.



The front work table has a fixed stop to register the material to be heated. The table also houses a beam positioning system that enables any heater beam to be accurately moved to its required position. A table mounted analogue display shows the current position of each heater beam.

## OPTIONS

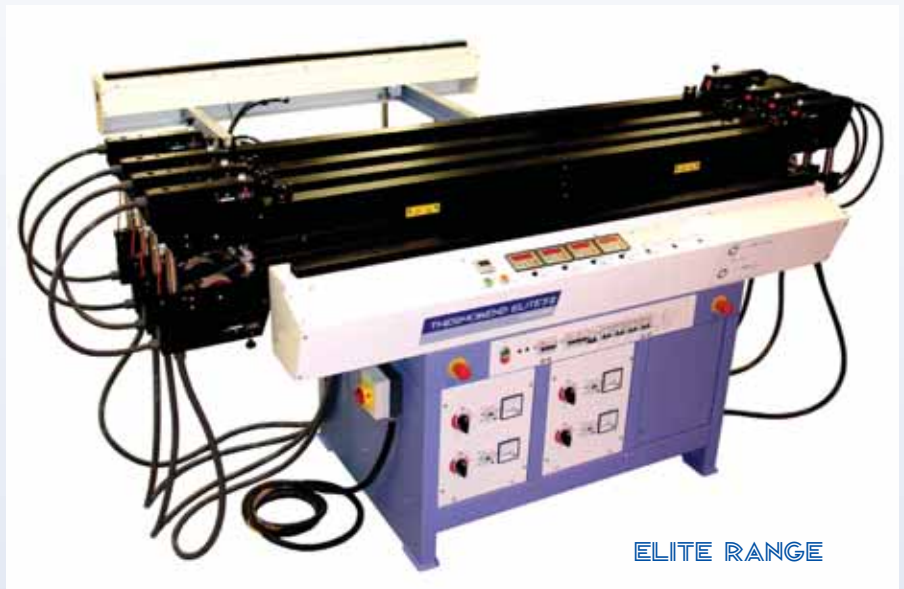
The standard length beam support rails allow maximum bend centres of 890mm. Extended rails can be specified increasing this to 1505mm or 2160mm.

The analogue beam position display can be upgraded to panel mounted 15mm LED digital readouts

A Rear Table with workstop and timer can be fitted to the machine. This enables a second operator to work independently at the rear of the machine. Heater Beams can be easily changed to operate from the rear or front workstation using table mounted selector switches.

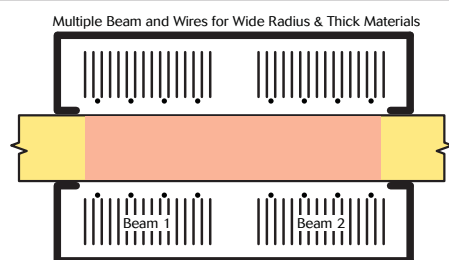
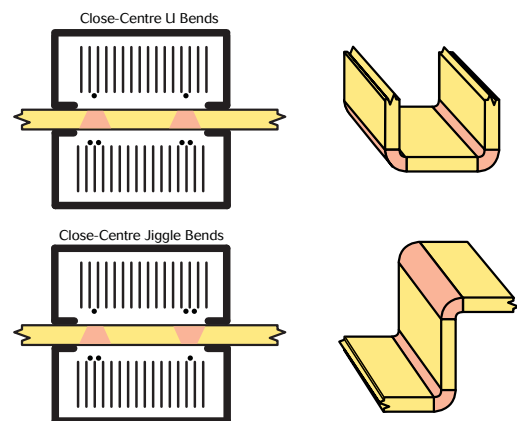
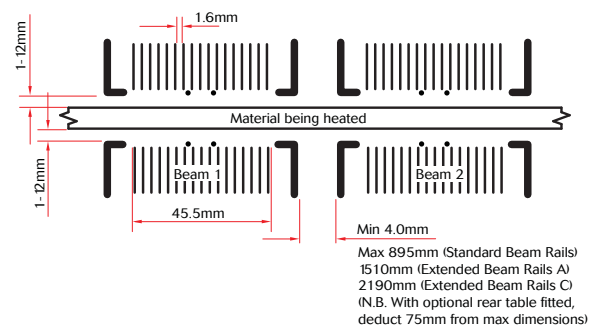
A Rear Workstop mounted on the positioning system can be specified, giving greater flexibility for tasks where the front workstop is inconvenient.

Work support tables can be used to prevent unsupported spans of material from sagging. Support tables are manually clamped onto the base frame as required.



ELITE RANGE

## WIRE POSITIONING INFORMATION



## L & LD RANGE

These strip heaters have been developed to provide an accurate, powerful and quickly adjustable heating system for materials up to 10mm in thickness. Machines are available in 1000mm, 1500mm and 2000mm working lengths. All machines can accommodate up to four double-wire heater beams, allowing multiple bends to be processed in one operation.

Heater Beams incorporate 2 individually tensioned heating wires that are fully adjustable for spacing and height. For thinner materials contact heating beams are available, while narrow single-wire beams can be used for close-centre folds.

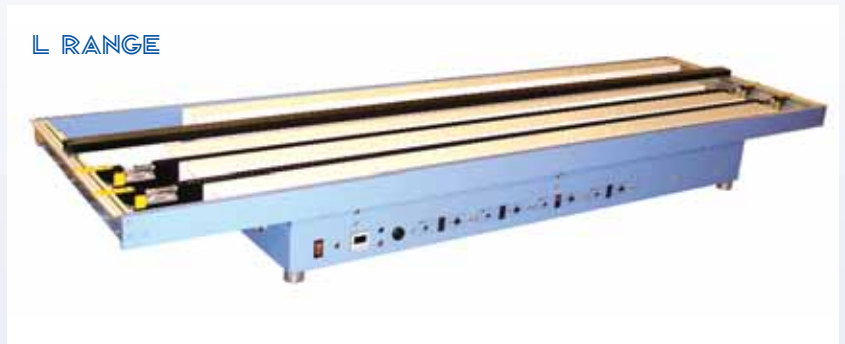
The fully adjustable workstop can be positioned either in front of or behind the heater beams to suit operator preference. Beam positions are also fully adjustable, with calibration strips at either end of the machine allowing quick and accurate setting. Clip-on slats support the material between the heater beams, preventing sagging between heated regions.

The L range provides lower heating only, while LD machines have a pneumatically operated, hinged upper frame that supports heating beams for double-sided heating.

Cycle times are controlled by a digital timer. On the L range machine, an audible alarm indicates that the heating cycle is complete. On the LD machines, the upper frame raises automatically at the end of the timed cycle, indicating that the material is ready for removal and folding.

The base frame of each machine houses all of the control equipment. L range machines can be bench mounted or freestanding with optional stands. LD machines are supplied as freestanding units. All stands are fitted with lockable castors for easy positioning.

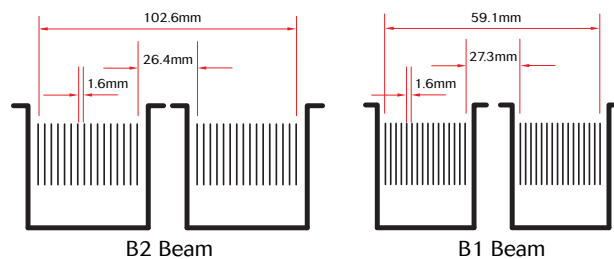
L RANGE



LD RANGE



WIRE POSITIONING INFORMATION



# CR CLARKE PLASTIC LINE BENDING

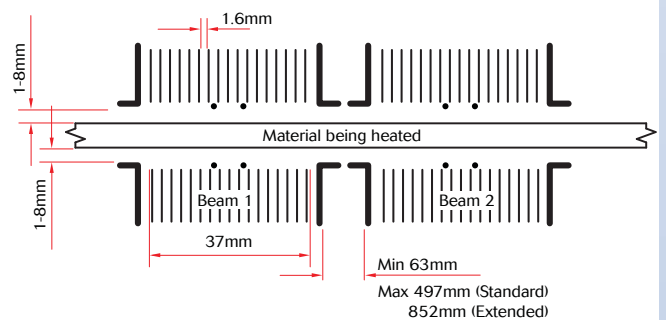
## 1200

The 1200 Hot Wire Strip Heater is a compact and efficient unit for locally bending thermoplastic materials up to 1250mm in length. A front work table houses the digital cycle timer and controls. Chrome plated slide rails behind the table provide a mounting for the lower heater beam. A pneumatically actuated hinged frame supports the upper heater beam.

Each heater beam can accommodate up to two low voltage tensioned resistance heating wires, which are adjustable for spacing and height. A low voltage power pack locates beneath the work table and provides power for the upper and lower heater beam. 1200 machines can accommodate up to four double-sided heater beams. Optional additions for the 1200 include a base frame extension for increased bend centres, contact heating foils for thin materials, and a stand complete with lockable castors.



### WIRE POSITIONING INFORMATION



## EDUCATIONAL RANGE

### HOT WIRE STRIP HEATERS 500 AND 920

These machines are our simplest strip heaters, with a single, guarded heating wire and one power setting. Working lengths are 500mm and 920mm respectively, and the machines are suitable for heating materials from 1-5mm in thickness.



### STRIP HEATERS 600D, 1000D, 1500D

These machines are identical to the S range, but with the addition of upper heating wires in the clamp beam. This reduces heating times by up to 50%, and is especially effective on materials of 3mm thick and above. Materials up to 10mm in thickness can be processed on these machines.



### STRIP HEATERS 600S, 1000S, 1500S

This new range of machines offers single sided heating with the benefit of twin heating wires for faster heating. The working lengths of the machines are 600mm, 1000mm and 1500mm respectively. Wires are adjustable for height and spacing, allowing materials up to 8mm in thickness to be processed. The hinged clamp beam holds the material in position during the heating cycle. A calibrated workstop makes setup quick and easy.

## THE PROCESS

When plastic materials are cut to size, the edges normally need to be polished to remove saw marks and create a high quality finish. Diamond polishing removes a small amount of material from the cut edge of the material using diamond cutting tools rotating at high speed. This operation converts a sawn edge to either a mirror polish or smooth satin finish in one pass. Diamond polishing is a very efficient process for straight edges of material, and is used extensively in commercial fabrication. Thick materials are processed as single pieces, while thinner parts can be run as a stack to improve efficiency.



Diamond polishing can be used on a variety of thermoplastic materials. While acrylics are used most commonly, our machines have also been successfully used on other materials including polyethylene, polycarbonate, ABS and PETg.

### Applications

- Polishing of Point of Sale and display parts
- Polishing prior to solvent cementing
- Polishing the ends of circular acrylic rods and tubes

## OUR PRODUCTS

All of our Diamond Polishing machines are designed for maximum rigidity and minimum vibration, to help achieve the best surface finish possible. Cutter and transport speeds are fully adjustable to assist in the processing of more difficult materials. We offer a service exchange scheme for the diamond cutter hubs, which require re-sharpening periodically. This service offers fixed-price servicing (excepting tool damage) while ensuring that replacement hubs are available promptly when you need them. For high-use customers, spare cutter hubs are available to keep with the machines at all times.

### 1550 DIAMOND POLISHER

This machine will process materials up to 50mm in thickness, and has 990mm infeed and outfeed tracks to handle full sheets of material. The 1550 is floor standing and removes 0.75mm per pass from the material being processed. The machine is supplied complete with our 1525E extraction unit.





## 1525 DIAMOND POLISHER

The 1525 is a bench mounted machine suitable for materials up to 25mm in thickness. The infeed and outfeed tracks are 455mm long, giving support for panels up to 800mm in length. Longer panels can also be processed. The 1525 removes 0.5mm per pass, which is ideal for smaller panel sizes.

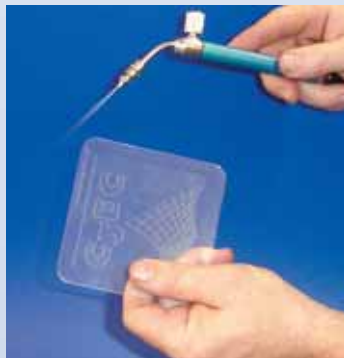
An extraction duct is fitted, with a 50mm diameter outlet on the side of the machine. This can be connected to any suitable extraction system, or to the 1525E extraction unit.



## FLAME POLISHERS

The FP01 and FP02 Flame Polishers produce combustible gas by electrically separating distilled water into hydrogen and oxygen. The generated gas is fed to a hand held torch where it is ignited, forming an accurate and controlled flame.

The flame is passed along the material to be polished, fusing the surface to produce a gloss finish. The controllable nature of the hand-held torch makes it ideal for polishing corner radii, slots and internal details along with conventional straight edges. Material up to 8mm can be polished in one pass. Multiple passes can be carried out to polish thicker materials.

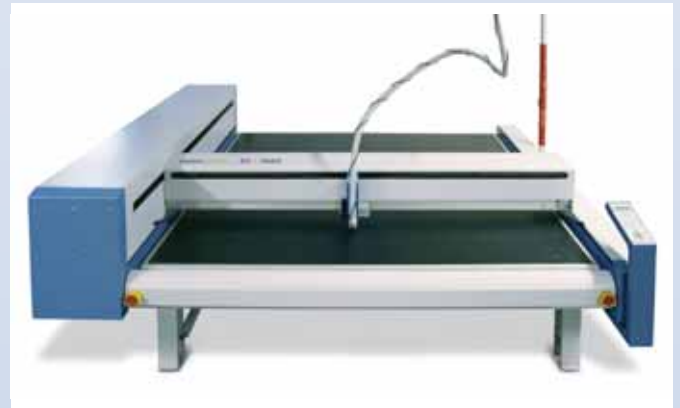


The FP01 will generate sufficient gas to run a single torch. The FP02 is supplied with two torches and generates enough gas to operate both simultaneously.



## EUROLASER LASER CUTTERS

We are UK distributors for Eurolaser laser cutting machines, and offer sales and technical support, installation and full maintenance cover. Laser cutting is a very efficient way of engraving and cutting acrylics, cutting any shape to size and leaving a polished edge straight from the machine. A full range of machine sizes is available from 800mm square to 3000 x 2200mm. Laser powers from 60 to 600W can be selected for the cutting of materials up to 25mm in thickness.



## CR CLARKE VACUUM FORMING

A flat thermoplastic sheet is clamped around its edges and heated. A mould is then elevated into the softened sheet and the air between mould and sheet is evacuated. Atmospheric pressure forms the sheet around the mould. Once cooled, the forming is removed for trimming and finishing.

### Applications

Vacuum forming is widely used in many industries, for example:

- Plastic packaging, chocolate box linings, sandwich boxes
- Fridge interior linings
- Aircraft interior trim parts
- Caravan shower cubicles, sinks
- Car parts, including bumpers and dashboards
- Point of sale display, for example cosmetic stands

### OUR PRODUCTS

Our vacuum forming machines have been developed for high performance, ease of use and low maintenance. All machines are fitted with high quality, filtered vacuum pumps with material blow release, and ceramic heater systems for fast and even heating. Smaller machines have heater hoods and platens that run on chrome plated slide bars with nylon bushes for smooth operation. Larger machines use telescopic slides and linear bearing technology coupled with rodless cylinders for smooth automatic operation. All machines are fitted with long-lasting silicone top seals and lift-out platen seals for ease of maintenance.

We also manufacture a unique trimming machine for the safe and easy trimming of vacuum formings, that is ideal for education and low volume manufacturing.



## EDUCATIONAL RANGE

### 1210

Sheet size 305 x 229mm. Aperture 280 x 204mm  
Maximum material thickness 6mm  
Maximum mould height 100mm  
Mechanical interlock to prevent moulds touching the heating elements  
Bench mounted, optional stand with castors available  
Range of moulds available, see Page 14.



### 725FLB

Sheet size 458 x 254mm. Aperture 432 x 228mm  
Maximum material thickness 6mm  
Maximum mould height 140mm  
Mechanical interlock to prevent moulds touching the heating elements  
Digital timer with audible end of cycle alarm  
Four zone heating system for maximum control  
Bench mounted, optional stand with castors and 1/2 sheet size reducing plate available  
Range of moulds available, see Page 14.



### 750FLB

Sheet size 508 x 458mm, aperture 482 x 432mm  
Maximum material thickness 6mm  
Maximum mould height 140mm  
Mechanical interlock to prevent moulds touching the heating elements  
Digital timer with audible end of cycle alarm  
Four zone heating system for maximum control  
Supplied with castor stand  
Optional 1/2 sheet and 1/4 sheet size reducing plates available



**PROFILE CUTTER 145**

Trims light gauge vacuum formings up to 3mm thick easily, safely & quickly:

- Combined adjustable and robust fence/guard for trimming fine details with flanges from 0 to 6 mm without changing tooling.
- Industrial single phase, balanced and fan cooled motor.
- Swarf collection duct for connection to an existing extraction unit (not essential to operation).
- Angled work support table.
- Foot switch operated for safety, allowing both hands to control the work during cutting.



145

**VACUUM FORMER 1820**

- 508 x 458mm sheet size. Aperture 482 x 432mm
- Maximum material thickness 6mm
- Maximum mould height 300mm
- Digital timer with audible end of cycle alarm
- Four zone heating system for maximum control
- Freestanding with castors

Options available include 1/2 sheet, 1/4 sheet and custom sheet sized reducing plates, Roll feed dispenser and timer controlled Cooling fans.



1820



242

**SEMI AUTOMATIC VACUUM FORMERS 242 AND 248**

These two industrial vacuum forming machines use single sided ceramic heaters to form materials up to 6mm in thickness, with the following maximum sizes:

**242**

Sheet Size 686 x 660mm. Aperture size 647 x 622mm.

**248**

Sheet Size 1372 x 660mm. Aperture size 1333 x 622mm.

Smaller sheet sizes can be accommodated with easily changed reducing plates.

The heater system is split into multiple zones, with an integrated PLC (Programmable Logic Controller) giving the operator total control over heat distribution. The platen has a full 320mm travel, enabling tall mouldings to be produced. Machines are fitted with a sheet leveling system to prevent material sag and maintain heat uniformity.

Once the material has been formed, high level centrifugal fans can be energised to rapidly cool the component. The heater system, platen and clamp frame are all pneumatically actuated from the PLC. This enables the machine to be run manually via panel mounted switches, or in automatic "load to unload" mode.

These machines can store multiple timer and heater settings, allowing easy setup and repeatability.

All machines are mounted on lockable castors for mobility.

## THERMOFORMING CENTRE 911

The 911 provides six thermoforming processes in a single machine. A two zone ceramic heater system ensures even heating for vacuum forming and also heats the fan circulated oven. A rotary switch allows the operator to select the required process, while a digital timer with audible alarm provides a useful timing guide. Processes included are:

### Vacuum forming

Two sizes included:

Sheet size 305 x 305mm.  
Aperture size 279 x 279mm.

Sheet size 305 x 152mm.  
Aperture size 279 x 127mm.

Maximum mould height  
115mm



### Dome Blowing

A cast acrylic or PVC sheet is heated in the oven. It is transferred to the Dome Blowing plate, clamped, and compressed air applied beneath it. This forms the material into a uniform hemisphere. The machine is supplied with rings for 305, 225 and 150mm diameter domes.



### Plastic Dip Coating

A 5 litre tank containing thermoplastic powder is loaded into the machine. Compressed air is forced through the powder to aerate it, making it behave like a fluid.

The metal item to be coated is heated in the oven and then dipped in the fluidised powder. The powder adheres to the hot metal. Once the item is removed from the tank the powder flows to form a smooth coating.



### Injection Moulding

The injection moulding unit is pneumatically powered by the machine's air pump. Material is heated in the oven in a high thermal mass aluminium pot. This pot is transferred to the injection moulding unit and injected into a suitable mould by the pneumatic cylinder. The machine comes complete with two moulds.



### Extrusion

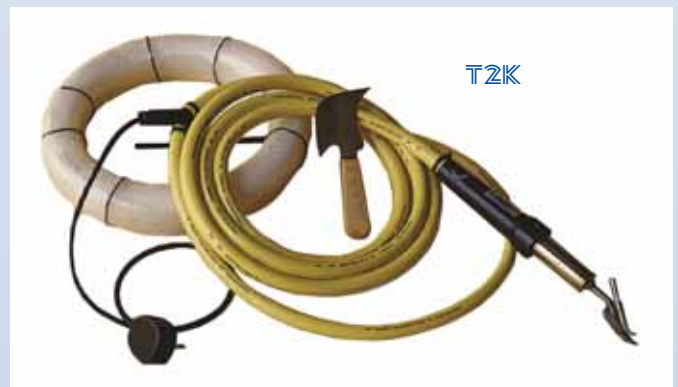
Extrusion is also carried out on the Injection Moulding unit, with the heated material being extruded through an I section nozzle into a cooling water tube.

### Plastic Welding

An industrial hot air torch is integrated into the machine for the welding of solvent resistant materials (e.g. polypropylene). A fold up work-table gives support for materials being welded along with a calibrated tilting stop for setting angles.

### T2K Hot Air Welding Torch

The hot air welding torch that is supplied with the Thermoforming Centre 911 is also available as a single unit. It can be operated using the air supply from a 1210, 725 or 750FLB vacuum former pressure outlet or a compressed air supply (requires a pressure regulator). The unit is supplied complete with 1 kg of Polypropylene welding rod.



# CR CLARKE SCHRED PLASTIC RECYCLING SYSTEM

## THE PROCESS

The Schred process makes usable plastic materials from offcuts and waste pieces of plastic, for example the flanges of vacuum forming sheets or used milk bottles.

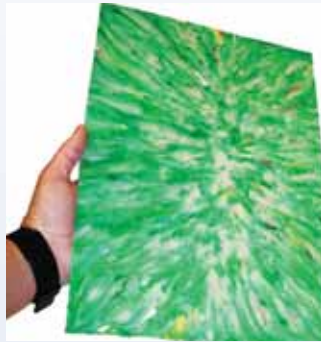
There are two stages to the Schred system. In the first stage, waste plastic is washed if necessary, and then chopped into fine granules using the Schredder.

The second stage of the process is to press the granulated material in the Schred press, melting the surfaces of the granules and fusing them together. This creates a plastic sheet that, while obviously recycled, is perfectly usable for a range of processes, including vacuum forming, line bending, laser cutting etc. Material thickness is not tightly controlled, but the sheets produced using the Schred press are typically 1.5 – 3mm in thickness.

The Schred press can also produce compression mouldings using the granulated plastic, and moulds are available.

### Applications

Schred is a low-speed recycling process, and therefore is best suited to educational environments. The Schred process teaches many important aspects of recycling and also reduces the need to buy new material for the school workshop.



## R25 SCHREDDER

This is a robust, industrial quality granulator suitable for most thermoplastic materials. Material is fed in through the guarded aperture at the top of the machine. It feeds through a hopper into the cutting chamber, where substantial rotating blades cut the material. A filter mesh ensures that the material remains in the cutting chamber until it is reduced to the required size. Once the granulated material passes out through the filter mesh, it arrives in the lower collection drawer, ready for use.

All machines are CE certified, and are available either with inverter drives for single phase connection, or for three-phase electrical supplies.



R25



R30

R30S

## R30 SCHRED PRESS

The R30 is a bench mounted machine with temperature controlled hotplates and manually operated hydraulic clamping to press the granules into new pieces of material. Time and temperature are both electronically controlled and user adjustable. A PTFE coated cassette is used to load the granules into the R30, making the process clean and simple. An optional stand with castors is available, making the R30 fully portable. A fan cooling unit can be fitted to the stand to decrease the cooling period of the completed piece of material.

## R30 PLATES AND MOULDS

Sheet Cassettes are available to make sheets of material of a size suitable for most vacuum forming machines. There is also an optional compression moulding tool, for making a Frisbee directly from granulated material.



## CR CLARKE VACUUM FORMING MOULDS

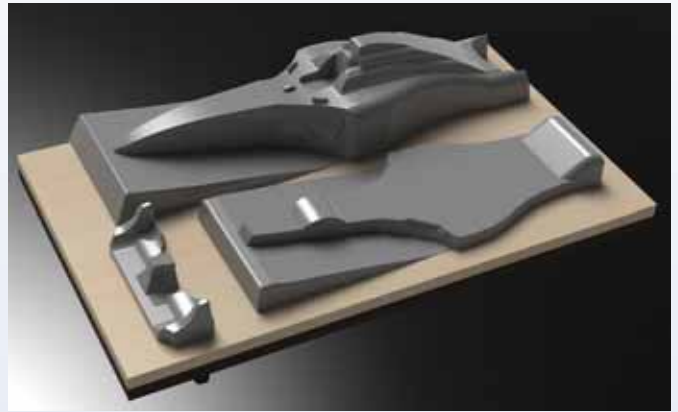
All of our moulds are cast from an aluminium-filled epoxy resin, for thermal performance and long life. Moulds are drilled with air evacuation holes and are pre-mounted on baseboards to fit our vacuum forming machines. Each mould is individually checked and tested prior to shipping.

Our range of moulds includes:

- Racing Car Mould
- Beetle style Car Mould
- Porsche style Car Mould
- Land-Rover style Car Mould
- Masquerade Mask Mould
- Gaming Console Accessory Holder
- MP3 Player Docking Station Mould
- 3D Snakes and Ladders Game Mould

### STANDARD VACUUM FORMING SHEET PACKS

Packs of 50 sheets of mixed colour, virgin grade polystyrene ideal for vacuum forming. These sheet packs are available in a range of sizes that are suitable to fit our vacuum forming machines without cutting.





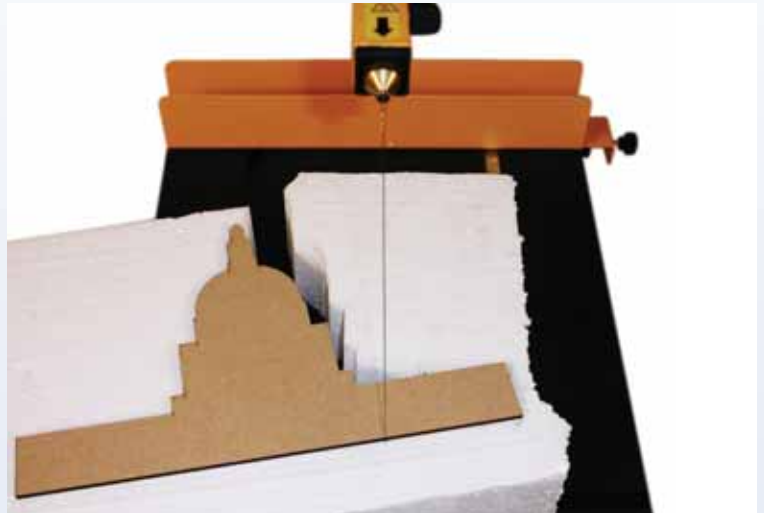
# CR CLARKE HOT WIRE CUTTING

## THE PROCESS

A tensioned resistance wire is heated electrically. The material to be cut must be an expanded material, normally polystyrene. The material is offered up to the heating wire, this melts the hollow bubbles of the foam causing them to shrink and create a clearance for the wire to pass through. Rigid materials cannot be cut in this way, as they will tend to weld together again after the heating wire has passed.

### Applications

- Architectural models and Scale Scenery
- Film and television props and scenery
- Model aircraft, including wing profiles and fuselages
- Freehand sculpting, for example models of people and animals



## HOT WIRE SCULPTOR 280

- 280mm cutting length.
- 635mm throat depth.
- Adjustable work guides for accurate material referencing.
- Robust polyethylene table.
- Wire bow protractor accurately sets angles, chamfers & cones.
- Hand-held sculptor tool for freehand work
- Stepless electronic temperature control for wire bow and handheld tool.
- Foot switch virtually eliminates fumes.
- 1,000 mm extended bow available.



## TRIFORM 180

The 180 uses a single transformer to provide a hot wire expanded polystyrene cutter and a hot wire strip heater. The expanded polystyrene cutter will accept materials up to 180mm in thickness, with a maximum throat depth of 480mm. The cutting wire can be tilted for angled cuts, and there is a sculptor tool for freehand work. The guarded strip heater will accommodate materials up to 300mm in length, and 6mm in thickness. A calibrated work fence aids setting of the bend position.



# CR CLARKE OVENS, DOME BLOWING AND PLASTIC DIP COATING

## 200FD AND 400FD OVENS

Both units are fitted with fan circulation, high quality heating elements and digital temperature control. 50mm of high temperature insulation allows the ovens to reach temperatures of 400°C which makes them suitable for most plastic processing requirements including plastic dip coating. Both units are bench mounted, with optional stands with lockable castors available.

### Internal Dimensions

200FD 508 x 355 x 304mm (WxDxH)

400FD 762 x 762 x 304mm (WxDxH)



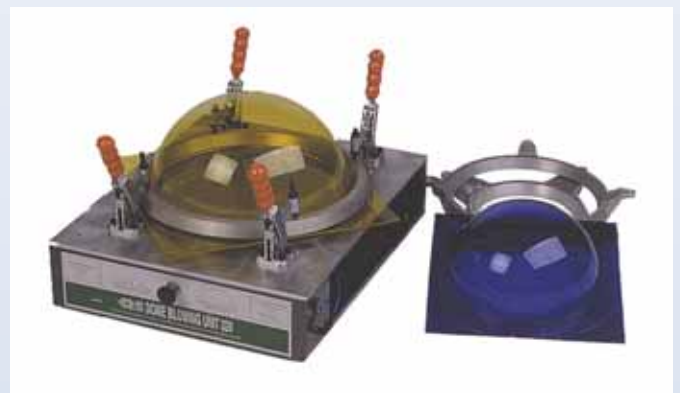
## DOME BLOWING



Heated thermoplastic materials with a strong elastic range (such as cast acrylic or PVC) can be blown into uniform hemispheres using compressed air. The 320 Dome Blowing Unit comes complete with cast aluminium rings to

produce domes of 300, 225 and 150mm in diameter. A pre-heated sheet of material is placed onto the rubber seal plate of the unit. The ring is clamped over it using adjustable toggle clamps. Compressed air, either from a compressor or our vacuum former pressure outlet, is applied under the material and it stretches into a uniform dome.

In addition to these sizes, the 640 will produce domes of 610mm in diameter. An integrated pressure regulator allows connection directly to a compressed air supply.



## DIP COATING

The CR Clarke Dip Coating system comprises a variable speed low-pressure blower unit (120), coupled with a range of fluidised baths. The most popular bath is the 300, which has internal dimensions of 300 x 300 x 600mm. For larger components, the 360 Fluidised Bath has dimensions of 600 x 600 x 600mm. For smaller objects or separate colours, the 150 bath can be clamped directly to the top of the 300, giving a 150 x 150 x 250mm tank. The 150R Fluidised bath is a freestanding unit that can also be operated from the 120 Blower Unit, but can also be driven from the pressure outlet of one of our vacuum forming machines.



## THE PROCESS

Plastic granules are heated to their molten state. They are forced into a shaped tool at high pressure, filling the tool cavity completely. After cooling, the tool is opened and the completed plastic component is removed or ejected.

Tooling costs for injection moulding are high compared with, for example, vacuum forming. However injection moulding is very attractive for high-volume components, as there is a minimum of finishing work required after moulding.

### Applications

Toothbrushes, switches, coffee machines, television casings, storage bins, plumbing fittings. Injection moulding is so widespread that almost any room will have at least one moulded component somewhere inside it.



## INJECTION MOULDER 25

Provides a clear demonstration of injection moulding principles, whilst producing dense, production quality mouldings up to 20 grammes in weight. Incorporating:

- Temperature controlled heating barrel.
- Rack & pinion ram.
- Over-centre mould closing system.
- Built-in part ejection system.
- Range of moulds available.
- Supplied with 2kg of Polyethylene granules.



