

# WELDING RELATIONSHIPS THROUGH TECHNOLOGY

**CLIFFORD**  
WELDING SYSTEMS

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## PREFACE



All product specifications, technical data and pictures are correct at time of production of this Brochure. Due to the ongoing improvement of our machines some of the data presented in this brochure may become outdated.

Please contact us or visit our website at [www.cliffeng.com](http://www.cliffeng.com) for the latest available information.

**Date of production June 2012**

**CLIFFORD**  
WELDING SYSTEMS



## INTRODUCTION TO CLIFFORD

### HISTORY

Clifford was founded in 1969 by Mr Clifford Sobey, who at that time, had already spent the past decade advising and consulting to the wire industry and developing and manufacturing machines for the industry. He established the company with a vision to produce top quality affordable machinery for the ferrous wire industry.

His vision has been realized over the years as Clifford developed from a small local company into an internationally recognized producer of technologically advanced machinery. The company has over the years applied sound basic engineering design principles and blended these with cutting edge technologies to produce machines that allow Clifford's customers to see significant cost, quality and production benefits in their manufacturing processes.

Clifford is situated in Pietermaritzburg, South Africa. This medium sized city, the capital of the province of KwaZulu Natal is located some 80 kilometres from Durban, the largest port in Africa and the second largest city in the country, and has all the required infrastructural requirements including road, rail, power and telecommunications to facilitate the production of our world class machinery. The facility is housed on 24000 m<sup>2</sup> and provides all the infrastructure required for design, development manufacture, assembly and testing of machines. Almost all manufacturing is done in house including machining, fabrication, cutting and finishing.



CLIFFORD SOBEY

### BUSINESS PHILOSOPHY

The core philosophy of Clifford is to create meaningful and mutually beneficial partnerships with our customers, employees and suppliers.

Our business motivation comes from a desire to create sustainable long term relationships with all role players to ensure mutually beneficial growth and profitability and to weld long lasting and committed futures between the parties.



IAIN AMBLER AND GRAHAM RAYNOR



**CLIFFORD**  
WELDING SYSTEMS

## INTRODUCTION TO CLIFFORD

### DESIGN

Clifford's focus in their design is the simplification of processes, reduction of labour, improvement in quality and consistency of machine output. Clifford has never hesitated to question and change traditional process and design thinking and continues to provide new and innovative solutions to the industry. In our current highly competitive global village where productivity is king, there is an ever increasing demand for faster machines producing less defective products and which are easier to set up and maintain by a smaller labour force. Clifford's team of skilled professionals recognizes these requirements and are dedicated to producing superior machines and are dedicated to unparalleled excellence in products and service. Our design department is charged with the responsibility of developing economic and productive solutions and offer the following services to achieve this:

1. Development of machine requirements in collaboration with the customer.
2. Advising on process and product flows ensuring optimal usage of machines supplied including consideration of raw material.
3. Supply to the machine and finished product removal from the machine.
4. Assisting with factory layouts and layout drawings.
5. Advising on all required utilities.
6. Design, detailing and specification of all electrical and mechanical machine components.
7. Research, development and constant innovation.



**CLIFFORD**  
WELDING SYSTEMS

## INTRODUCTION TO CLIFFORD

### MANUFACTURING, ASSEMBLY AND COMMISSIONING

The Clifford commitment to excellence requires that we are continuously at the forefront of manufacturing techniques. From painting to machining, fabrication to materials acquisition, we ensure that we are using the latest available technologies and highly skilled and trained personnel to produce machines that are reliable, durable, accurate and fit for purpose.

All machining, fabrication and painting is done in house to ensure that our quality standards are never compromised. Once all manufacturing processes are completed, all components are transferred to our assembly shop. Assembly of machines occurs under laboratory conditions with extreme attention to detail. The final product is exhaustively tested before being disassembled, packed and shipped to site. Our experienced on site commissioning engineers then re-commission the machine and train operators to ensure many years of trouble free and effective operation.



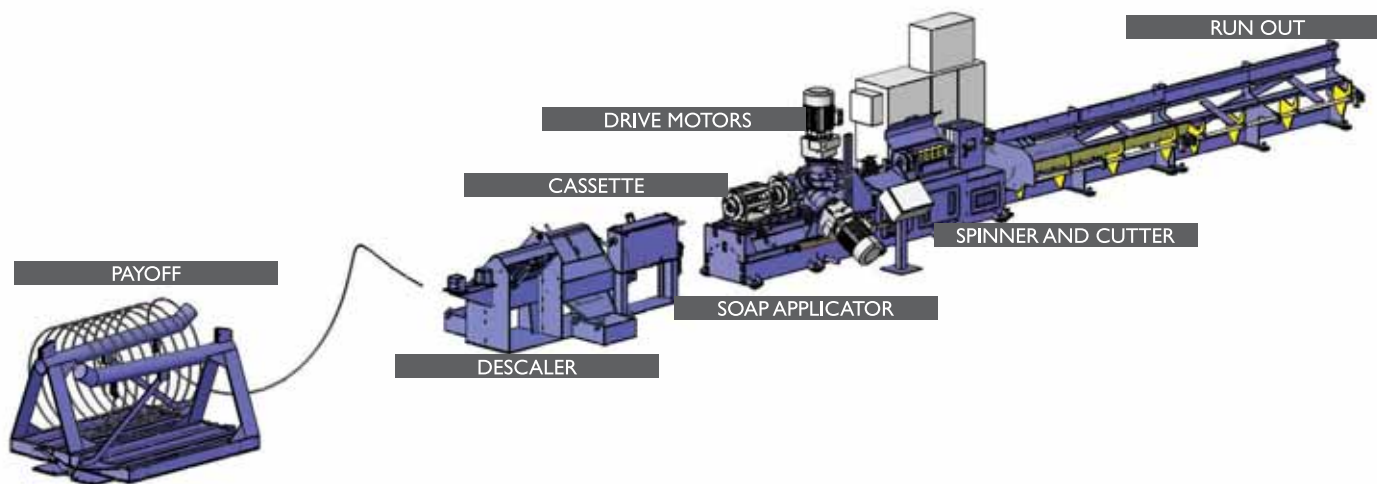
### SPARES AND AFTER SALES SERVICE

When the industrialist purchases a Clifford machine they do so with the peace of mind that the backup of our product is world class. In order to ensure that customers are supported with adequate spare wearing parts, non wearing parts and support, the following systems are in place to ensure that machine down time is kept to a minimum:

- Comprehensive spare parts manuals supplied with each machine
- Detailed and complete “as built” drawings retained for every machine built by Clifford Comprehensive spare parts store for immediate availability of common spares
- Use of well known and internationally supported brands in machine construction
- On line diagnostics and troubleshooting allowing qualified engineers to access your machine from our base in South Africa ( machine dependant)
- Dedicated support team of engineers available for telephonic support
- Trained engineers available at certain geographic locations around the world.



## INTEGRATED PROFILING, STRAIGHTEN AND CUT TO LENGTH MACHINES



The IPC line is a fully integrated line for production of cold rolled, ribbed, straight lengths of high tensile steel bar for reinforcing purposes or for line/cross wires for welding into reinforcing mesh.

- The wire is fed from a payoff system. The payoff type is dependant on feed speeds required and coil type. Refer page 19/20 for payoff selections.
- The machine has roller reducing units to provide the required reduction in cross sectional area and to introduce the profiling onto the wire. The final profiling rollers are driven by AC motors with frequency controlled drives resulting in reduced maintenance costs.
- The wire is straightened in a conventional straightening arbor and is cut to length in a rotating shear assembly. Length is determined from an electronic length input control. Wires are discharged into a receiving tray with a pneumatic end alignment system.
- Extra features include bundle batching station.





# INTEGRATED PROFILING, STRAIGHTEN AND CUT TO LENGTH MACHINES

## THE IPC LINE CONSISTS OF THE FOLLOWING COMPONENTS:

- Payoff system
- Inline mechanical descaler
- Lubricant applicator
- Rolling section
- Straightening section
- Flying shear
- Straight length accumulator
- Bundle batching station



BUNDLE BATCHING STATION

## TECHNICAL SPECIFICATIONS

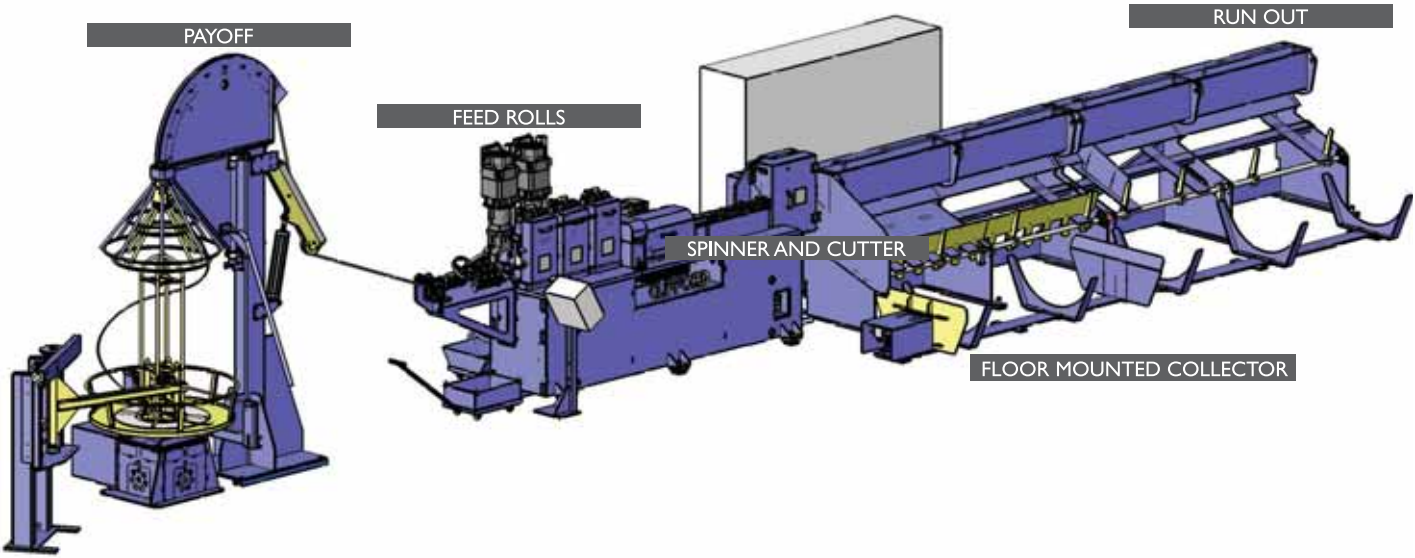
| MODEL NUMBER             | HPC / IPC           |
|--------------------------|---------------------|
| Max. inlet wire diameter | 17mm                |
| Max. finished section    | 16mm equivalent     |
| Min. finished section    | 4mm                 |
| Output wire              | Profiled and smooth |
| Max. rolling speed       | 400m/minute         |
| Max. cut length          | 13,000mm            |



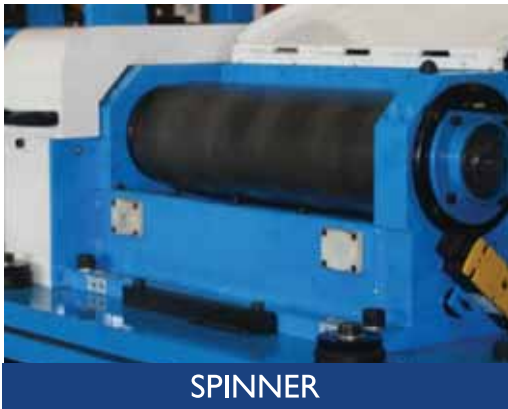
IPC LINE WITH 13M RUN OUT



# STRAIGHTENING AND CUTTING MACHINES



The Clifford ULTRACUT and OPTICUT wire straightening & cutting machines are designed as modular lines to accommodate a range of wire straightening and cutting requirements, for the high speed production of straightened and cut wire.



SPINNER

## TECHNICAL SPECIFICATIONS

| MODEL NUMBER                  | ULTC/OPC                                                        |
|-------------------------------|-----------------------------------------------------------------|
| Wire diameter Min.            | 1.6mm                                                           |
| Wire diameter (<800 MPa) Max. | 12mm                                                            |
| Cut length                    | Up to 3000mm standard / additional 3000mm extensions available. |
| Operating speed in the tray   | Up to 300m/min.                                                 |

## STRAIGHTENING AND CUTTING MACHINES

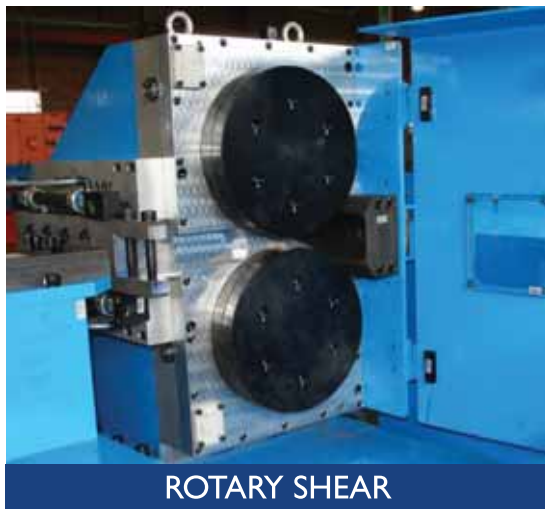
These machines are of a robust modular design and are offered with a range of different payoff options to suit the presentation of the wire. The wire is driven by a series of feed wheels through a spinner assembly and is cut to length in a high speed flying shear. The shear is designed to give a flush, square end cut at maximum operating speed. Gearing between the feed and spinner drives ensures constant “spinner ratio” under all conditions to provide optimal straightness of the finished wires. The ULTRACUT can be supplied with three quick change spinners to cover a range of wire sizes from 2 - 12mm.

The machine is designed to reduce the process induced vibration as much as possible to increase maintenance intervals and reduce running costs.

Length is digitally programmed for very quick length setting and changeovers. Batches are digitally controlled in predetermined sizes. The ULTRACUT can be supplied with various modular measurement systems depending on customer requirements.

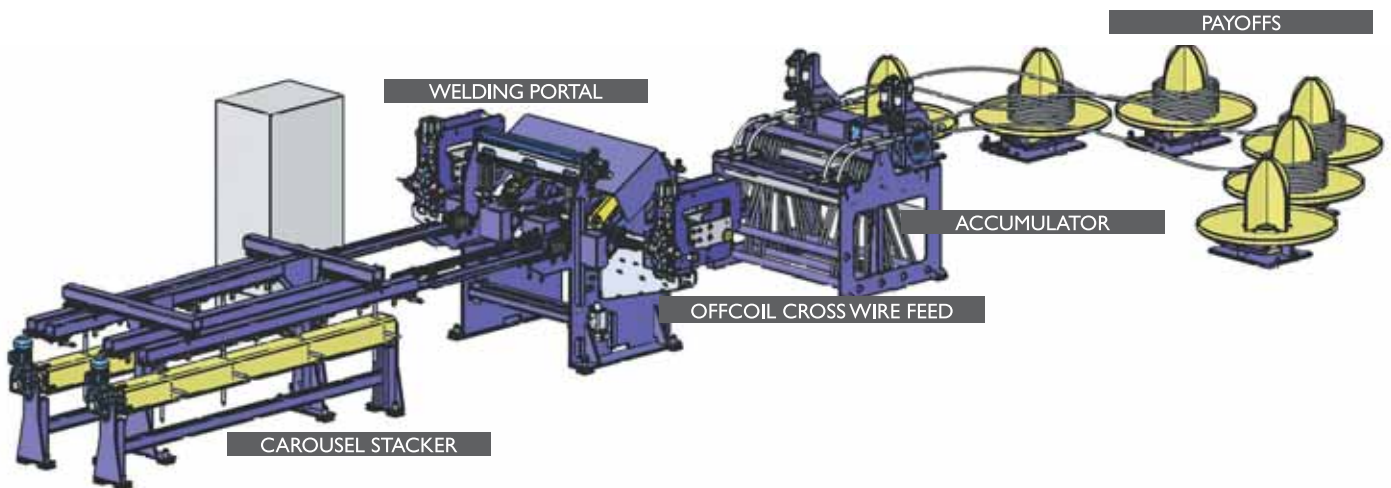


ULTC HIGH SPEED MACHINE



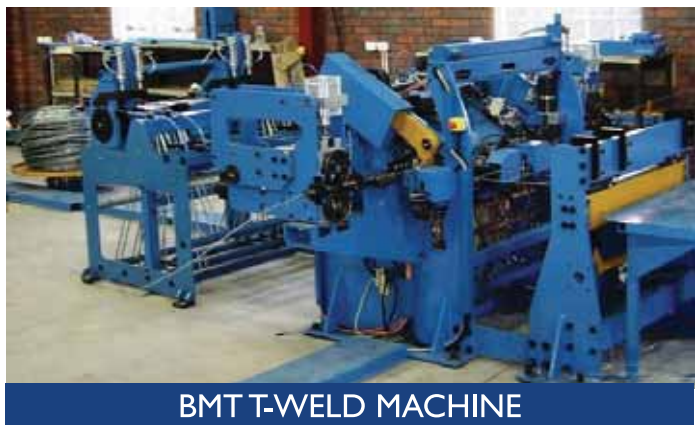
ROTARY SHEAR

## BRICK MESH / LADDER MESH MACHINES



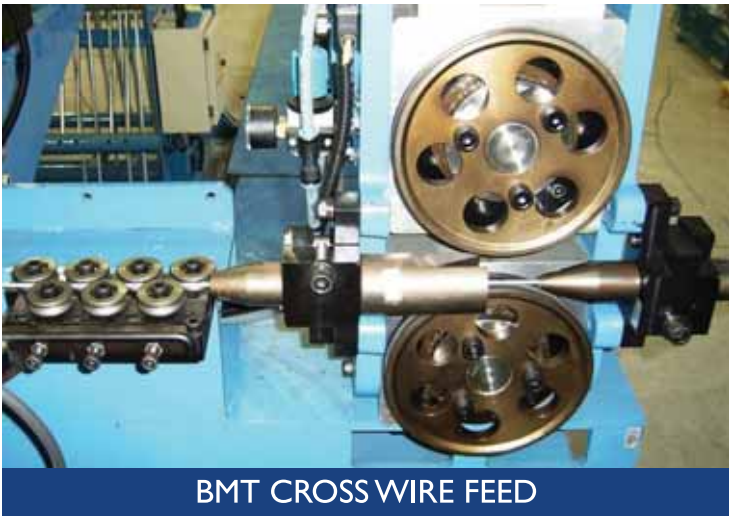
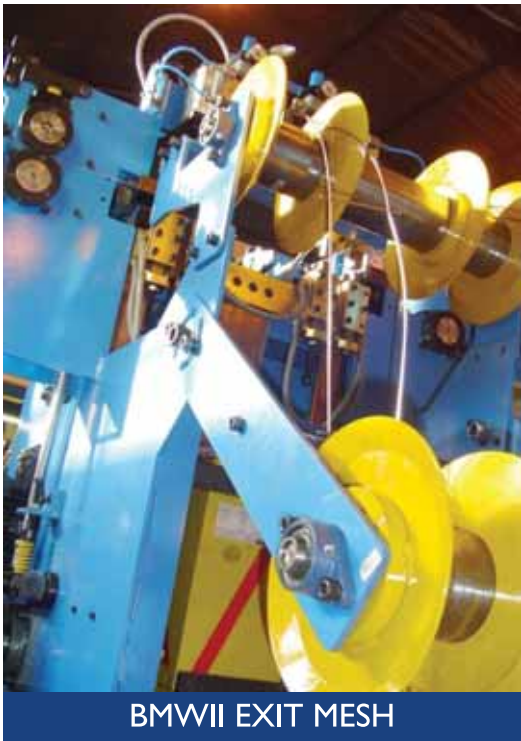
### KEY BENEFITS OF THE MODEL BMT /BMW BRICK MESH MACHINE (MODEL DEPENDANT) :

- Linewires and crosswires offcoil
- Coil feeder unit allows for high speed machine operation with minimal amount of back drag from the line wires
- Dual plane linewire and crosswire straightening
- Infinitely adjustable linewire spacing
- Simultaneous production of two strips of mesh of different widths
- Continuous production of strips during cutting cycle
- Storage of up to 16 different mesh programs
- Optional coiler for coiled meshes
- Carousal stacking system for flat meshes
- Option of T-weld or Lap weld
- Fast setup
- Capable of making “Zig Zag” or single plane truss mesh



BMT T-WELD MACHINE

BRICK MESH / LADDER MESH MACHINES

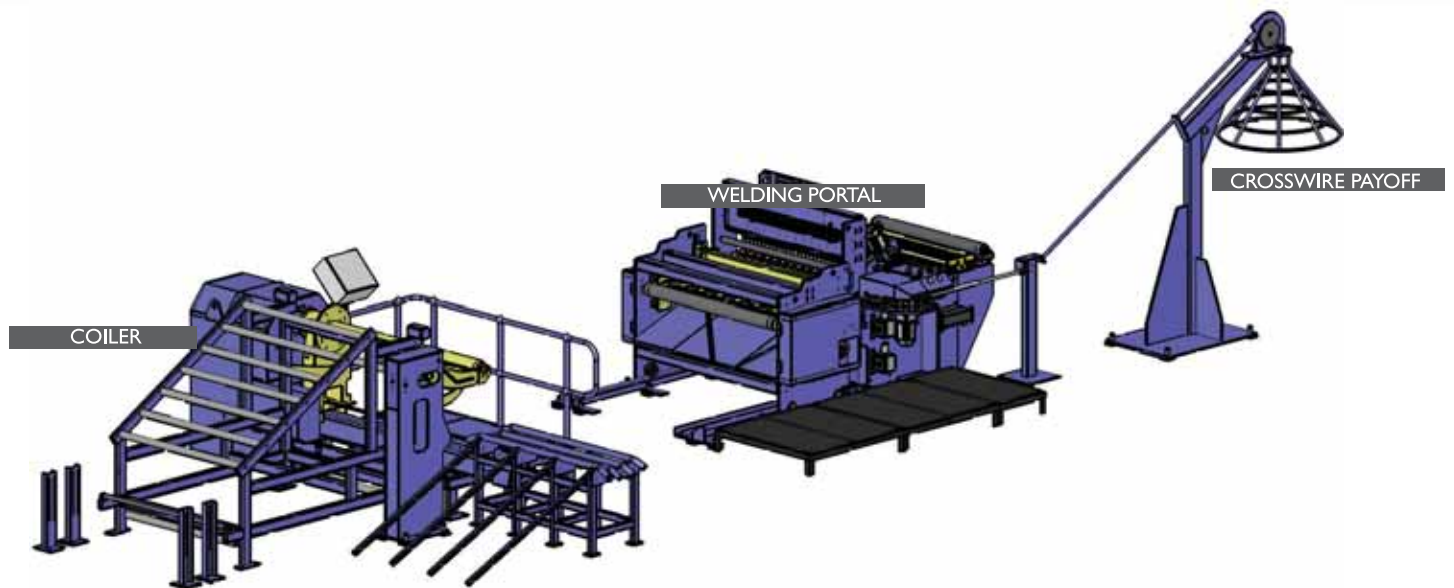


TECHNICAL SPECIFICATIONS

| MODEL NUMBER         |      | BMT/BMW II                                 |
|----------------------|------|--------------------------------------------|
| Number of linewires  |      | 2 - 24                                     |
| Size of linewires:   | Max. | 6mm                                        |
|                      | Min. | 1.6mm                                      |
| Number of crosswires |      | 2 (one from either side)                   |
| Size of crosswires:  | Max. | 6mm                                        |
|                      | Min. | 1.6mm                                      |
| Operating speed      |      | 250 crosswires per minute ( 125 per lane ) |



## FINE MESH WELDERS



The Clifford FINE MESH WELDER is perfect for those applications requiring the welding of thin diameter wire in small pitches.

### KEY BENEFITS OF THE FINE MESH MACHINE:

- Fully automated
- Offcoil line wire and cross wires
- All functions are controlled and monitored by a central PLC, which is coupled to an industrial PC for human machine interface
- Welding centres adjustable across the width of the machine
- Dual plane crosswire straightening
- User friendly software.
- Direct programming of weld controller data and weld press selection.
- Clear text error message display.
- Online help with full user manual accessible from disk.
- Touch screen operator interface.
- Error reporting system incorporated as standard.
- Efficiency reporting system incorporated as standard.
- Integral faultfinding "internet connection" incorporated
- Medium frequency welding available



**CLIFFORD**  
WELDING SYSTEMS

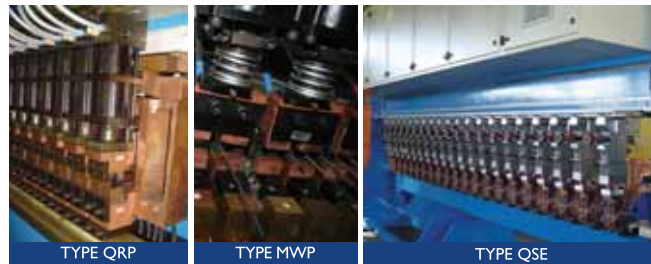
FINE MESH WELDERS



TECHNICAL SPECIFICATIONS

| MODEL NUMBER                     | FMW                                                        |
|----------------------------------|------------------------------------------------------------|
| No. of linewires                 | Up to 145                                                  |
| Machine Widths                   | 1.2m 2.0m 2.4m                                             |
| Linewire pitch:                  | Variable with a minimum of 12.7mm and dependant on tooling |
| Crosswire pitch:                 | Variable from 10mm and dependant on tooling                |
| Crosswire and linewire diameters | 1mm - 3mm                                                  |
| Maximum operating speed          | 130 crosswires/min.                                        |

## LARGE MESH WELDERS



## LARGE MESH WELDERS

The Clifford range of LARGE MESH WELDERS is differentiated based on customer requirements, mesh characteristics, mesh product type and investment sum available. Below find a table summarizing the three main types of Clifford welding portals.

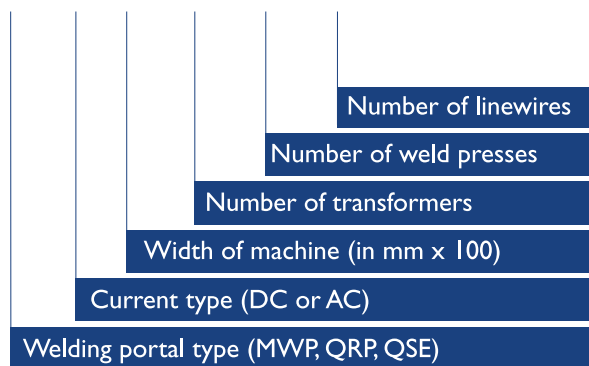
The welding portal forms an integral part of the mesh line and ancillary equipment which is again dependant on customer requirements and are added to this portal to arrive at a suitable solution to customer needs. Such ancillary equipment includes line wire payoffs, line wire control, line wire feeders, cross wire insertion, mesh extraction, shears, stacking and turning, coilers, mesh transport and other such ancillary equipment which is detailed in the pages following.

| MODEL | WIRE        | LINE WIRES         | CROSS WIRES        | MAIN APPLICATIONS                     | SUMMARY                                                                   |
|-------|-------------|--------------------|--------------------|---------------------------------------|---------------------------------------------------------------------------|
| QRP   | 4 to 16mm   | Offcoil or Pre-cut | Offcoil or Pre-cut | Reinforcing Mesh                      | Quick change for multiples of 50 and 75mm linewire pitches (2 and 3 inch) |
| MWP   | 1.8 to 16mm | Offcoil or Pre-cut | Offcoil or Pre-cut | Fencing and Reinforcing Mesh          | Cost effective machine with manual setup                                  |
| QSE   | 1.8 to 16mm | Offcoil or Pre-cut | Pre-cut only       | Fencing (especially security fencing) | Quick change with CNC automatically positioned welding elements           |

### NAMING CONVENTIONS

Each Clifford mesh welder derives its model number from the following naming convention:

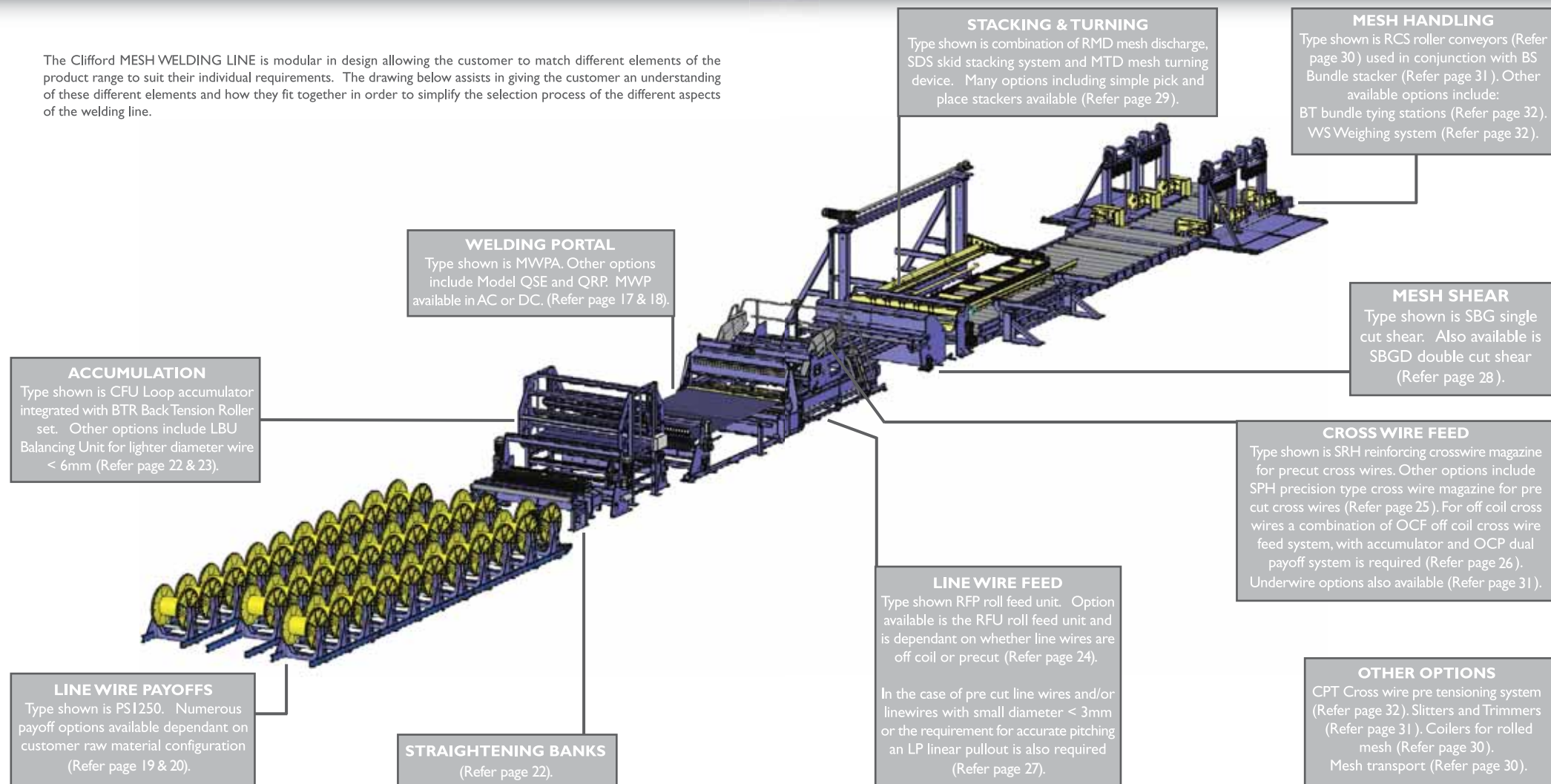
MWP A 24 / 6 - 12 - 24





## LARGE MESH WELDERS

The Clifford MESH WELDING LINE is modular in design allowing the customer to match different elements of the product range to suit their individual requirements. The drawing below assists in giving the customer an understanding of these different elements and how they fit together in order to simplify the selection process of the different aspects of the welding line.





## LARGE MESH WELDER PORTALS

### TECHNICAL SPECIFICATIONS

| MODEL NUMBER                        | MWP                                                                                            | QRP                                                                                   |
|-------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Linewire Diameter:<br>Max.<br>Min.  | 16mm<br>1.8mm                                                                                  | 16mm<br>4mm                                                                           |
| Crosswire Diameter:<br>Max.<br>Min. | 16mm<br>1.8mm                                                                                  | 16mm<br>4mm                                                                           |
| Linewire Length:<br>Max.<br>Min.    | 12000mm<br>2000mm                                                                              | 12000mm<br>2000mm                                                                     |
| Crosswire Length:<br>Max.<br>Min.   | 4200mm<br>1000mm                                                                               | 4200mm<br>1000mm                                                                      |
| Linewire Pitch:                     | Variable from<br>19mm                                                                          | Increments of<br>50mm and 75mm (2 and 3 inch)                                         |
| Crosswire Pitch:                    | Variable from<br>10mm                                                                          | Variable from<br>10mm                                                                 |
| Welding Transformers                | 125 - 250kVA                                                                                   | 125 - 250kVA                                                                          |
| Water Cooling System                | Top Electrodes<br>Lower Electrodes<br>Thyristors<br>Transformers<br>Flexible current<br>cables | Top Electrodes<br>Bottom Electrodes<br>Thyristors<br>Transformers<br>Busbars          |
| Computer                            | Industrial P.C. with UPS,<br>Touch Screen Interface and<br>Multi Recipe Functionality          | Industrial P.C. with UPS,<br>Touch Screen Interface and<br>Multi Recipe Functionality |
| Weld Controls:                      | Thyristor Switching / medium<br>frequency                                                      | Thyristor Switching / medium<br>frequency                                             |
| Control System                      | PLC - Siemens S7                                                                               | PLC - Siemens S7                                                                      |
| Maximum Operating Speed             | 180 xwires / min.                                                                              | 125 xwires / min.                                                                     |
| Wire Type                           | SAE 1006 - 1015                                                                                | SAE 1006 - 1015                                                                       |

## LARGE MESH WELDER PORTALS

### TECHNICAL SPECIFICATIONS

| QSE                                                                                   |
|---------------------------------------------------------------------------------------|
| 16mm<br>1.8mm                                                                         |
| 16mm<br>1.8mm                                                                         |
| 12000mm<br>2000mm                                                                     |
| 4200mm<br>1000mm                                                                      |
| Variable from<br>19mm                                                                 |
| Variable from<br>10mm                                                                 |
| 63 - 125kVA                                                                           |
| Top Electrodes<br>Bottom Electrodes<br>Thyristors<br>Transformers<br>Busbars          |
| Industrial P.C. with UPS,<br>Touch Screen Interface and<br>Multi Recipe Functionality |
| Thyristor Switching / medium<br>frequency                                             |
| PLC - Siemens S7                                                                      |
| 140 xwires / min.                                                                     |
| SAE 1006 - 1015                                                                       |



MWP

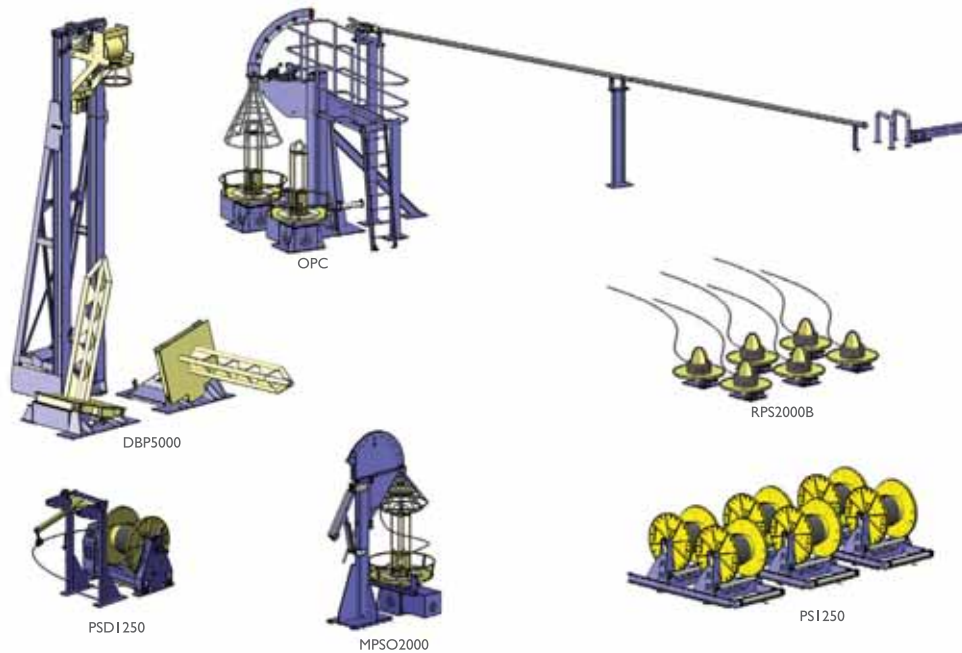


QRP



QSE

## PAYOFFS



## PAYOFFS



Dual Flipper Payoff



BMW II Payoff



MPSO2000 Payoff



Overhead Payoff

### TYPES OF PAYOFFS AVAILABLE

|                                            | DB TYPE<br>TILTING BOLLARD<br>OFF WITH TOWER | PSD TYPE<br>SPOOL PAYOFF<br>WITH DANCER (OPTIONAL<br>COLLAPSIBLE MANDREL) | MPSO TYPE         | OPC TYPE<br>(OPTIONAL<br>HORIZONTAL DANCER) | PS TYPE                   | RPS TYPE                  |
|--------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------|-------------------|---------------------------------------------|---------------------------|---------------------------|
|                                            |                                              | HORIZONTAL                                                                | VERTICAL          | VERTICAL                                    | HORIZONTAL                | VERTICAL                  |
| LAYER WOUND COIL (2 - 12MM)                | YES                                          | NO                                                                        | YES (MAX 8MM)     | YES                                         | NO                        | YES                       |
| CHEESE COIL (COLLAPSIBLE SPOOL) (3 - 12MM) | NO                                           | YES (USES MANDREL)                                                        | YES (USES DANCER) | YES (USES DANCER)                           | NO                        | YES                       |
| COIL ON SPOOL (3 - 12MM)                   | NO                                           | YES                                                                       | YES (USES DANCER) | YES (USES DANCER)                           | YES                       | YES                       |
| LAYER WOUND ROD (5.5 - 13MM)               | YES                                          | NO                                                                        | YES               | NO                                          | NO                        | YES                       |
| TYPICALLY USED ON THE FOLLOWING MACHINES   | ROLLING LINE, HPC, IPC                       | OPC, ULTRACUT                                                             | OPC, ULTRACUT     | OFF COIL CROSS WIRE<br>MESH WELDER          | MESH WELDER<br>LINE WIRES | MESH WELDER<br>LINE WIRES |

## LINEWIRE CONTROL

The line wire control is dependent on which combination of line wire configurations are required ( off coil, pre cut or combination) and the various options of line wire control are listed. Dependant on the configuration, a combination of the following equipment will be required for line wire control:

- Line wire payoffs ( Off coil )
- Line wire table ( Pre cut )
- Line wire straightening set ( Off coil )
- Loop accumulator or balancing unit ( Off coil )
- Line wire feeder - RFU, RFP

The line wire payoff options are listed in the previous section

|          |                   |                        |                                    |     |                |
|----------|-------------------|------------------------|------------------------------------|-----|----------------|
| OFF COIL | Line wire payoffs | Line wire straightener | Loop accumulator or balancing unit | RFU | Welding Portal |
|----------|-------------------|------------------------|------------------------------------|-----|----------------|

|        |                 |     |                |
|--------|-----------------|-----|----------------|
| PRECUT | Line wire table | RFP | Welding Portal |
|--------|-----------------|-----|----------------|

|             |                   |                        |                                    |                 |     |                |
|-------------|-------------------|------------------------|------------------------------------|-----------------|-----|----------------|
| COMBINATION | Line wire payoffs | Line wire straightener | Loop accumulator or balancing unit | Line wire table | RFP | Welding Portal |
|-------------|-------------------|------------------------|------------------------------------|-----------------|-----|----------------|

### LINE WIRE TABLE

| MODEL NUMBER       |      | TBLM    |
|--------------------|------|---------|
| Linewire length:   | Max. | 12000mm |
| Linewire length:   | Min. | 2000mm  |
| Linewire diameter: | Max. | 16mm    |
| Linewire diameter: | Min. | 3mm     |

The table is extremely robustly constructed allowing for up to 3000kg bundles of wire to be loaded while the machine is running. The bundles can be sorted across the table area for easy access to individual wires by the operator. Options for automatic pick up of line wires are available.

LINE WIRE STRAIGHTENING AND BALANCING UNITS



DUAL PLANE LWS STRAIGHTENING ROLLS

| MODEL NUMBER                     |      | LWS24          |
|----------------------------------|------|----------------|
| Wire diameter:                   | Max. | 12mm           |
| Wire diameter:                   | Min. | 1.8mm          |
| No. of rolls per str. roller set |      | 5              |
| No. of straightening planes      |      | Single or Dual |

The roller straightening sets are required to straighten the off coil line wires before entering the welding portal and are classified as light and heavy. The light sets have a max diameter range of 6mm and can be single or dual plane.

BALANCING UNITS



LBU SHOWING SPRING LOADED ARMS

The line wire balancing unit incorporates separate spring loaded arms for each line wire to allow for averaging of the payoff speed during the line wire advance by the mesh welder. Only applicable to line wire diameters up to 8mm. Each wire is fed through a separate pulley system for 50mm centres, and two wires per pulley for 25mm centres.

| MODEL NUMBER   |      | LBU32                    |
|----------------|------|--------------------------|
| Wire diameter: | Max. | 6mm                      |
| Wire diameter: | Min. | 1.8mm                    |
| Linewire pitch |      | 25mm dual or 50mm single |



## LOOP ACCUMULATORS AND BACK TENSION ROLLERS

The coil feeder consists of a free standing drive unit and a separate loop accumulator. The coil feeder drives the linewires into a low resistance loop taking all of the forces of the payoff units and the linewire straighteners. This allows the mesh welding line to run with minimal drag on the linewire advance system.

The backtension roller assembly is located between the loop accumulator and the welding machine. This is a 3 roll straightening roller bank which is used to remove any permanent set in the wire from the loop accumulator and to provide a small amount of back tension between the welding machine and the loop accumulator.



FEED ELEMENTS TO LOOP ACCUMULATOR



LOOP ACCUMULATOR WITH BACK TENSION ROLLERS

| MODEL NUMBER                          |      | CFU                  |
|---------------------------------------|------|----------------------|
| Width between outside linewires: Max. |      | 4200mm               |
| Wire diameter:                        | Max. | 12mm                 |
| Wire diameter:                        | Min. | 3mm                  |
| Linewire pitch                        |      | >50mm                |
| Wire snag sensor                      |      | On trip line in loop |

## LINE WIRE FEEDERS RFP AND RFU

The rotary linewire feeder is a free standing unit designed to allow servo controlled advance of the linewires into the welding position.

The unit is equipped with individual pneumatic pressure cylinders for each linewire. The pressure elements are mounted on a dovetail rail for easy adjustment and are driven by a common splined shaft.

The splined drive shaft is driven by a servo motor, mounted at the end, through a helical bevel gear reduction gearbox.

The choice of RFP or RFU is dependant on whether the customer is using pre cut or off coil line wires. Selection criteria are set out in the table on page 21.

The RFP is a unit designed to index both pre cut and off coil line wires and it has a motorized traverse so that it can be placed in the optimal position for the pre cut line wire length. The RFU is used only for off coil applications.



MODEL RFP WITH TELESCOPIC GUIDE TUBES

| MODEL NUMBER                          |      | RFP       | MODEL NUMBER                          |      | RFU       |
|---------------------------------------|------|-----------|---------------------------------------|------|-----------|
| Width between outside linewires: Max. |      | 4200mm    | Width between outside linewires: Max. |      | 4200mm    |
| Wire diameter:                        | Max. | 16mm      | Wire diameter:                        | Max. | 12mm      |
|                                       | Min. | 4mm       |                                       | Min. | 4mm       |
| Wire length:                          | Max. | 12000mm   |                                       |      |           |
|                                       | Min. | 2000mm    |                                       |      |           |
| Linewire centres:                     |      | Min. 50mm | Linewire centres:                     |      | Min. 50mm |

## CROSS WIRE INSERTION

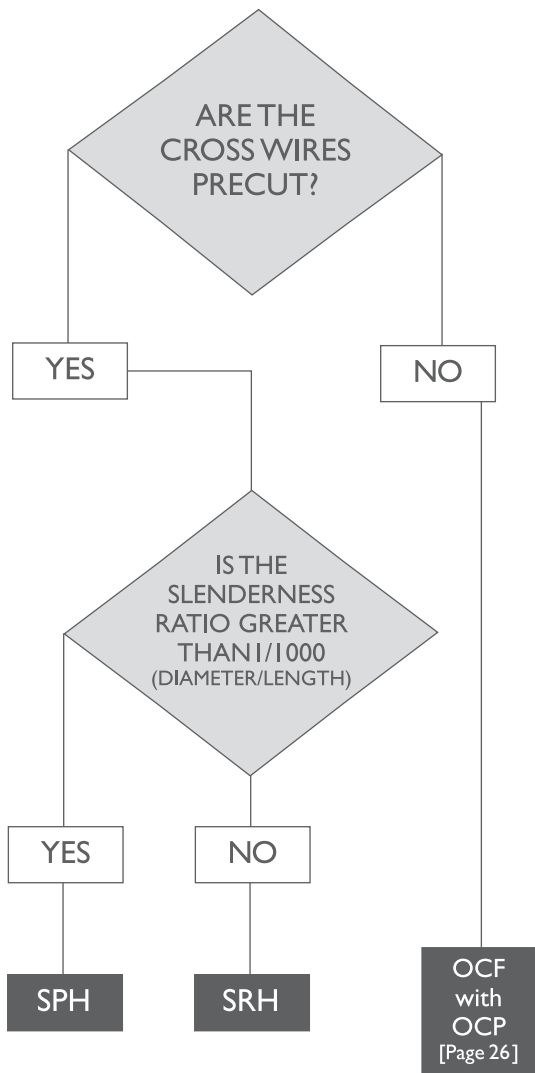
| MODEL NUMBER              |      | SRH                            |
|---------------------------|------|--------------------------------|
| Wire diameter:            | Max. | 16mm                           |
|                           | Min. | 4mm                            |
| Wire length:              | Max. | 4300mm                         |
| Prefeeder system          |      | Mild steel and Stainless steel |
| Wire type                 |      | Smooth or profiled             |
| Bulk storage weight: Max. |      | 2000kg                         |

| MODEL NUMBER              |      | SPH                            |
|---------------------------|------|--------------------------------|
| Wire diameter:            | Max. | 10mm                           |
|                           | Min. | 1.8mm                          |
| Wire length:              | Max. | 4300mm                         |
| Prefeeder system          |      | Mild steel and Stainless steel |
| Wire type                 |      | Smooth or profiled             |
| Bulk storage weight: Max. |      | 2000kg                         |



PRE CUT CROSS WIRE MAGAZINE

The method of crosswire insertion is typically decided by the following decision tree:



The pre cut crosswire magazine is a gap type feeder, with picker disc eject mechanism. The single gap type crosswire feeder also includes an automatic sorter mechanism and prefeeder, with a bulk storage hopper. The magazine allows for simple adjustment for different crosswire diameters by means of a single lever.



CROSS WIRE INSERTION



CROSS WIRE PAYOFF TO  
LOOP ACCUMULATOR



The offcoil crosswire feed system consists of two payoff units, crosswire drive, large inline loop accumulator and roll feed system to feed wire into the mesh welder through two sets of roller straightening units. The straightened crosswires are fed into a crosswire control magazine and are cut to length with a servo controlled shear. Wires are placed into the welding point with a series of mechanical placement pushers from the feed position on the control magazine. As an option an automatic cross wire changeover system is available.

| MODEL NUMBER   |      | OCF    |
|----------------|------|--------|
| Wire diameter: | Max. | 12mm   |
|                | Min. | 3mm    |
| Wire length:   | Max. | 4300mm |
|                | Min. | 600mm  |

LOOP  
ACCUMULATOR  
TO FEED ROLLS



FEED ROLLS TO  
CROSS WIRE PLACEMENT





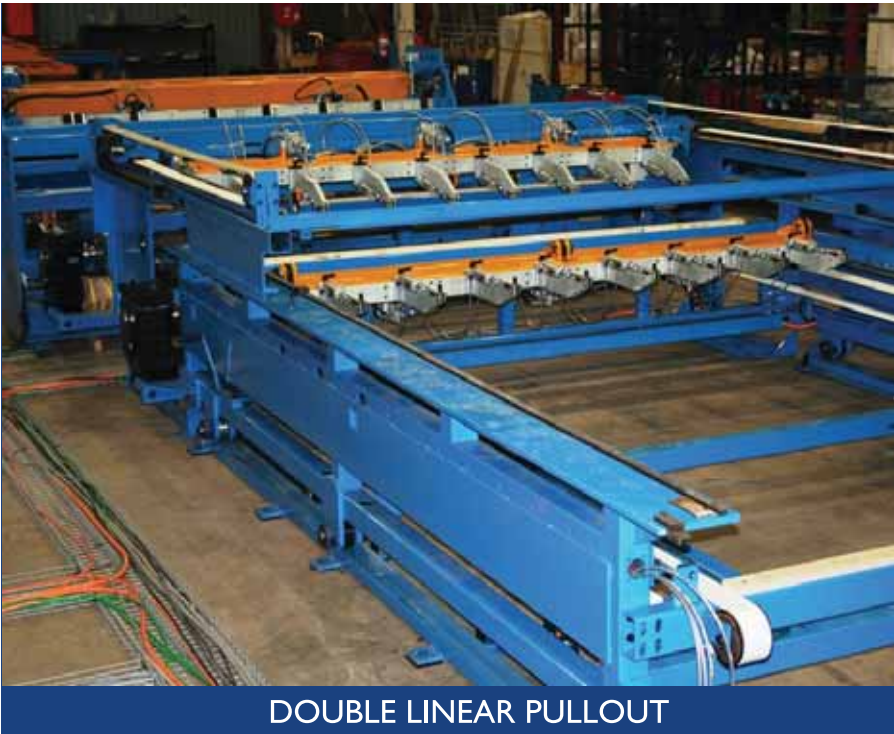
# MESH EXTRACTION

The LP Linear pullout is used in pre cut line wire applications and also in off coil applications where pitch tolerance and mesh squareness is critical.

The line wire advance is a linear pullout system with a servo controlled pullout carriage, which is used to advance the mesh one pitch at a time through the welding portal. The pullout carriage has a pneumatically actuated beam with crosswire gripper assemblies, which grip on the already welded cross wires in the sheet.

In order to avoid the stop in mesh production when the LP returns to its start point, a double pullout (LPD) is an option that ensures that while the one pullout is returning to its start position, the other continues to index the mesh.

| MODEL NUMBER      |      | LP                 |
|-------------------|------|--------------------|
| Mesh width:       | Max. | 4300mm             |
| Pullout length    | Max. | 8000mm             |
| Gripper actuation |      | Pneumatic          |
| Pullout drive     |      | Servo with gearbox |



DOUBLE LINEAR PULLOUT

# SHEARS

The automatic inline linewire shear allows for shearing of the linewires between the crosswires with either a single (SBG) or double blade (SBGD). If the single blade is used, the wires are sheared leaving flying ends on either end of the mesh panel. If the double blade is used, with the appropriate crosswire pitch, the linewires between the two adjacent crosswires are removed resulting in flush cut ends on the completed sheets.



SBGD DOUBLE CUT SHEAR

## KEY BENEFITS OF THE SHEARS:

- Motorized positional adjustment for positioning between cross wires.
- Double cut shear with removable lower front counter cutter for producing single cuts. (SBGD Only)
- Pneumatic clutch actuation.
- Flush shearing on front and back of mesh sheets. (SBGD Only)
- Automatic positioning to compensate for mesh expansion. (SBGD Only)

| MODEL NUMBER          | SBG AND SBGD             |
|-----------------------|--------------------------|
| Max cut / mesh width  | 4300mm                   |
| Blade gap - daylight  | 35mm                     |
| Positional adjustment | AC Geared Motor          |
| Blade Actuation       | Pneumatic Clutch / Brake |

| WIRE DIAMETER                         | 3  | 4  | 5  | 6  | 8  |
|---------------------------------------|----|----|----|----|----|
| Minimum Linewire Pitch (Single Cut)   | 25 | 25 | 38 | 55 | 97 |
| Maximum No. of Linewires (Single Cut) | 49 | 49 | 49 | 49 | 39 |

| WIRE DIAMETER                         | 3  | 4  | 5  | 6   | 8   |
|---------------------------------------|----|----|----|-----|-----|
| Minimum Linewire Pitch (Double Cut)   | 27 | 49 | 76 | 110 | 195 |
| Maximum No. of Linewires (Double Cut) | 49 | 49 | 49 | 35  | 19  |

Bigger linewire shears are available for special requirements.

## STACKING AND TURNING

There are two available options that Clifford offers. The first is simple stacking using SSM Mesh stacker, and the second is turning and stacking using a combination of the RMD, SDS and MTD

The automatic sheet stacker (SSM) removes the completed mesh sheets from the line and stacks them onto a suitable pallet. The stacker automatically fills the pallet to a predetermined number of sheets before alerting the operator that the stack is complete

The automatic mesh turning and stacking system consists of a mesh discharge system (RMD), mesh turning device (MTD), mesh discharge skids (SDS) and stack control plates. This is a fully automated mesh handling system to remove the mesh from the machine, turn every alternate sheet and stack the sheets onto a neat stack ready for tying.

| MODEL NUMBER             |              | TSM                                |
|--------------------------|--------------|------------------------------------|
| Mesh Discharge           |              | TSM-RMD Roller Discharge           |
| Mesh Turning             |              | TSM-MTD Turning System             |
| Mesh Stacking            |              | TSM-SDS Skid Type Discharge        |
| Wire width:              | Max.<br>Min. | 4200mm (Turning 3200mm)<br>1200mm  |
| Sheet length:            | Max.<br>Min. | 12000mm (Turning 6000mm)<br>2000mm |
| Sheet weight:            | Max.         | 180kg                              |
| Pneumatic control panels |              | 4 side and 2 end plates            |



TURNER AND STACKER

| MODEL NUMBER       |      | SSM       |
|--------------------|------|-----------|
| Mesh Sheet width:  | Max. | 4200mm    |
| Mesh Sheet length: | Max. | 9000mm    |
| Mesh Sheet weight: | Max. | 100kg     |
| Stack height:      | Max. | 800mm     |
| Stack counters     |      | Automatic |



PICK AND PLACE STACKER

# COILERS AND MESH TRANSPORT

## COILERS

The coiler is a semi-automatic machine requiring the mesh to be engaged on the mandrel by hand. Control of the coiling speed is infinitely variable from zero to the maximum speed. This enables the speed of the coiler to be regulated to approximately that of the mesh welding machine for any conditions. A dancing arm can be included to control the coiling speed.

As an option Clifford supplies a fully automatic CWMA version that does not require operator intervention to engage the mesh on the mandrel. This option includes an integrated shear.



COILER WITH DANCING ARM CONTROL

| MODEL NUMBER       |              | CWM                             |
|--------------------|--------------|---------------------------------|
| Mesh width:        | Max.         | 3300mm                          |
| Mesh Sheet weight: | Max.         | 550kg                           |
| Roll diameter:     | Max.         | 1000mm                          |
| Wire diameter:     | Max.<br>Min. | 6mm at 100mm centres<br>1.8mm   |
| Mandrel speed      |              | 0 to 30 rpm infinitely variable |

## MESH TRANSPORT

The conveyers are provided in module lengths of 6m, with each module having a separate drive motor and control limit switch and come in chain or roller type conveyors. Certain modules of the Clifford Mesh Line require conveyors as standard (Turner Stacker, Weighing station, Bundle Stacker). Alternatively the conveyors can be used as efficient transport systems for finished mesh product.

| MODEL NUMBER     |      | RCS    |
|------------------|------|--------|
| Mesh width:      | Max. | 4200mm |
| Weight capacity: | Max. | 2000kg |



MESH TRANSPORT



## OTHER WELDING LINE OPTIONS

### • SLITTERS AND TRIMMERS

Inline trimmer/slitter are equipped with either pneumatic or hydraulic cutting heads for either edge trimming or slitting, depending on configuration. The slitter/trimmer heads are mounted on a dovetail for easy adjustment. Each lower blade is equipped with its own separate guide wheel arrangement to ensure accurate guidance of the line wires prior to the trimming operation.

| MODEL NUMBER        |      | HTS AND PTS |
|---------------------|------|-------------|
| Pneumatic trimming: | Max. | 5mm         |
| Pneumatic slitting: | Max. | 4mm         |
| Hydraulic trimming: | Max. | 8mm         |
| Hydraulic slitting: | Max. | 6mm         |



HYDRAULIC TRIMMER HEAD

### • BS BUNDLE STACKER

The automatic bundle stacking system is designed to be used inline with a standard turner and stacker. This system is capable of stacking up to four bundles of mesh onto a single stack. The system uses pneumatically engaged forks to lift the mesh, using an AC motor lift arrangement to raise the bundle/s. The system includes a section of conveyor to suit the bundle stacker operation.

| MODEL NUMBER                 |      | BS     |
|------------------------------|------|--------|
| Bundle length for stacking:  | Max. | 6000mm |
|                              | Min. | 3000mm |
| Mesh width:                  | Max. | 4200mm |
|                              | Min. | 2000mm |
| Weight :                     | Max. | 5000kg |
| Max. completed bundle height |      | 1200mm |



BUNDLE STACKER

### • UNDERWIRE MAGAZINES

The lower cross wires are fed from the crosswire hopper in the machine by means of a motorized injector. The wires are then pushed into position in the welding area by a series of pushers across the width of the machine.

| MODEL NUMBER   |      | UDZ    |
|----------------|------|--------|
| Wire diameter: | Max. | 8mm    |
|                | Min. | 3mm    |
| Length:        | Max. | 4200mm |
|                | Min. | 1000mm |

# OTHER WELDING LINE OPTIONS

• WS WEIGHING SYSTEM

The weighing system is designed as an in line measurement tool to weigh mesh stacks as they come out of the mesh welder. Used in conjunction with a conveyor system, the mesh stacks pass over a load cell which accurately measures the weight of the stacks. All weight information is recorded on the computer

| MODEL NUMBER                |      | WS     |
|-----------------------------|------|--------|
| Bundle length for weighing: | Max. | 8000mm |
|                             | Min. | 3000mm |
| Mesh width:                 | Max. | 4200mm |
|                             | Min. | 2000mm |
| Weight :                    | Max. | 5000kg |

• CPT CROSS WIRE PRE TENSIONING SYSTEM

The crosswire pre-tensioning system is designed to clamp onto the lower electrode carrier rail to provide a pretension in the crosswire before and during the weld sequence. The pre-tensioning system has two heads, one being a clamping head only and one a clamp and tension head. The clamp/tension head is designed to ensure that the material is securely clamped prior to the tensioning force being applied. Maximum welding speed with crosswire tensioning: 100 - 110 welds per minute.

| MODEL NUMBER   |      | CPT   |
|----------------|------|-------|
| Wire diameter: | Max. | 6mm   |
|                | Min. | 1.8mm |

• BT BUNDLE TYING STATIONS

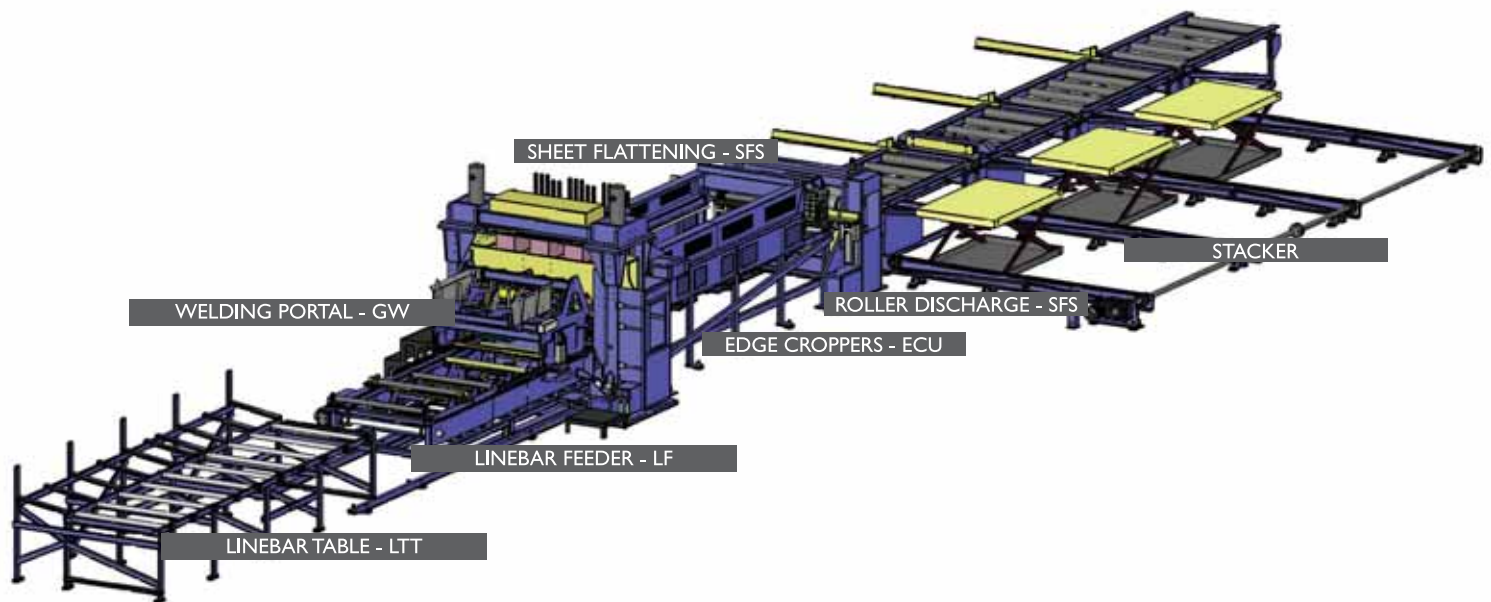
The automatic mesh stack tying system has two tying positions, one on either side of the bundle. The mesh stack is fed through the tying station in increments to the correct tying positions where the two heads complete the tying operation. This can be programmed for either two or three tying positions.

For each tying position the tying head is inserted into the bundle, the tie wire fed into the loop, the tying head retracted and twisted to form an effective tie. The wire is then cut and flattened onto the stack.

| MODEL NUMBER            |      | UDZ    |
|-------------------------|------|--------|
| Stack height for tying: | Max. | 400mm  |
| Mesh width:             | Max. | 4200mm |
|                         | Min. | 1200mm |



## GRATING WELDERS



The machine is capable of welding up to 45 Cross wires per minute. This speed is dependent on numerous factors including, but not limited to, quality and consistency of material, line bar sizes, cross wire diameters, maintenance of the machine and operator abilities. The line would typically require two operators at the loading station and one at the welding portal/crosswire magazine. Other operators may be required for material handling to and from the machine. Many options are available including off coil load bar and cross wire systems, integrated shears and cutting systems.

### KEY BENEFITS OF THE GRATING WELDERS:

- Low electricity consumption
- Shortest setup time
- Innovative cross wire trimming system
- Efficient secondary circuit
- Modular design and upgradeable
- Multiple configuration options
- Wide range of finished products
- Robust construction
- Longer machine life
- Continuous production
- Simple welding system
- Low maintenance



GW10 GRATING WELDER

**CLIFFORD**  
WELDING SYSTEMS

# GRATING WELDERS



CROSSWIRE MAGAZINE

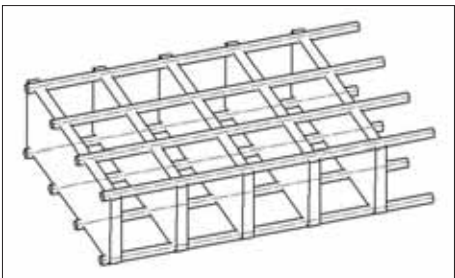


AUTOMATIC LINEBAR FEEDER

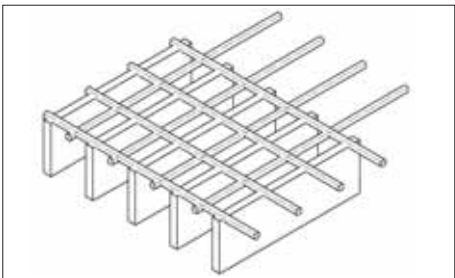
## TECHNICAL SPECIFICATIONS

| MODEL NUMBER             |      | GW                                                        |
|--------------------------|------|-----------------------------------------------------------|
| Load bar sizes:          | Max. | 120 x 10                                                  |
|                          | Min. | 20 x 2                                                    |
| Load bar length:         | Max. | 9000mm                                                    |
|                          | Min. | 3000mm                                                    |
| Load bar pitch           |      | Variable from 11mm                                        |
| Crosswire pitch          |      | Variable from 25mm                                        |
| Maximum welding pressure |      | 100 tonnes                                                |
| Welding systems          |      | AC, 3 phase DC                                            |
| Cross wires              |      | Twisted square 4-10mm across flats. Round 4-12mm diameter |
| Loadbar type             |      | Serrated, smooth, Mild Steel, Stainless Steel             |

The Clifford GW range comes in standard widths of 1200mm.



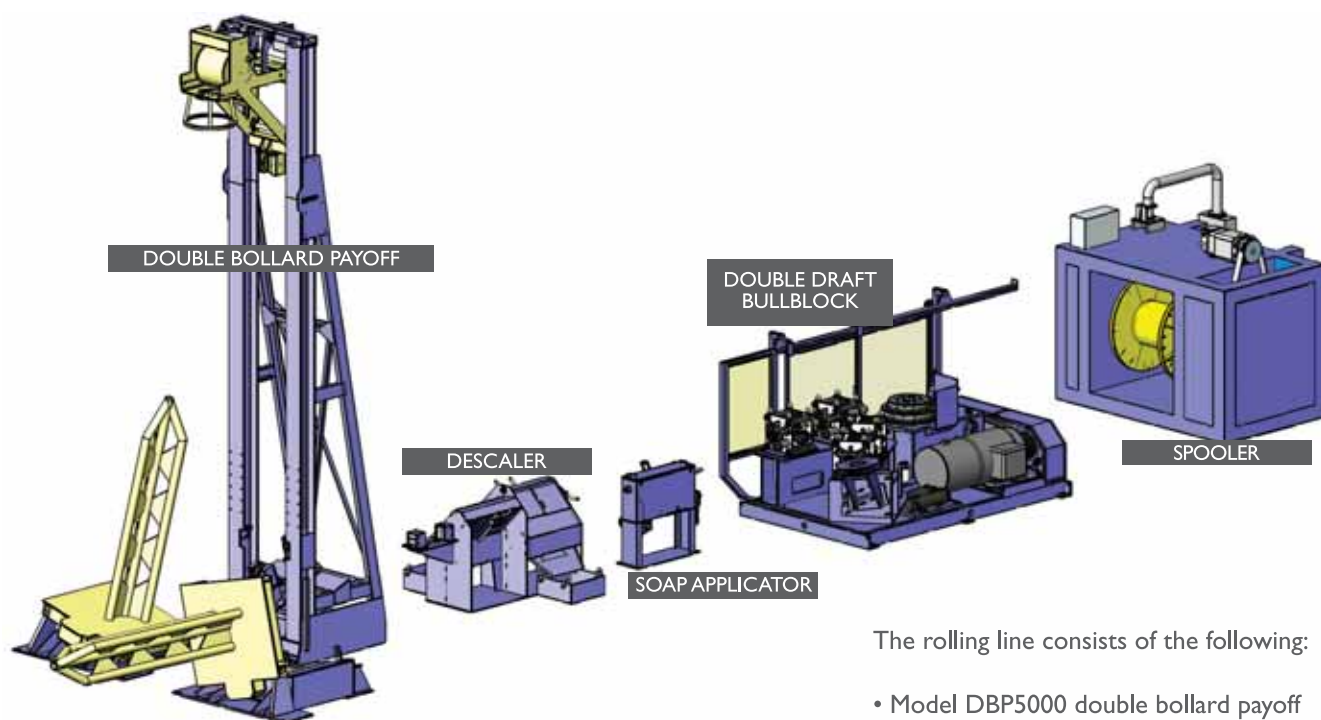
DOUBLE



OFFSHORE



## ROLLING LINES



The rolling line consists of the following:

- Model DBP5000 double bollard payoff
- Model MDS14 mechanical descaler
- Model SAD14 soap applicator
- Model CRD14 cassette roller die units
- Model DBB13 double draft bullblock
- Model SPI250 spooler

### KEY FEATURES OF ROLLING LINES:

- Driven by AC variable speed drive system.
- Constant torque drive system for constant spooling force.
- Three speed gearbox.
- Simple mechanical gear change lever.
- Wire break detector.
- Emergency stop sequence for rapid stopping of the system.
- Integral lubrication system with cooler.
- Safety guards and switches to minimize risk to personnel.
- Synchronised variable speed AC motor driven layering pulley.
- Adjustable spool width.
- Adjustable layering speed.
- Control station for the whole line.
- Length control system.



CRD14 CASSETTE

# ROLLING LINES

## TECHNICAL SPECIFICATIONS

| MODEL NUMBER         |      | RL12                             |
|----------------------|------|----------------------------------|
| Number of drafts     |      | 2                                |
| Block diameters      |      | 700mm<br>525mm                   |
| Max. inlet wire size |      | 14mm                             |
| Drawing speeds:      | High | 0 - 12.5 m/sec                   |
|                      | Med  | 0 - 9 m/sec                      |
|                      | Low  | 0 - 3.8 m/sec                    |
| Motor power          |      | 200 kW                           |
| Water sooling        |      | Cassette roller discs            |
| Max pulling force:   | High | 1400 kg                          |
|                      | Med  | 2300 kg                          |
|                      | Low  | 4000 kg                          |
| Drive controller     |      | AC with variable frequency drive |



## NIBBLERS

### NIBBLERS



This versatile edge trimming and nibbling machine is used for the cleaning and trimming of welded wire products, such as freezer baskets, fridge shelves, wire bird cages, wire display panels and mesh panels; where a neat burr-free finish is required. The trimming/nibbling machine is equipped as standard with three sets of cutting points. These consist of one at either end of a central rocker shaft and one situated at the top of the machine. Due to the dual blades two operators may work simultaneously. The machine is also provided with a top slitting blade which can be used to either slit sheets of mesh or for cutouts in mesh panels.

| MODEL NUMBER                         | NBD     |
|--------------------------------------|---------|
| Max. dia. (600MPa)                   | 10mm    |
| Min. dia. (600MPa)                   | 1mm     |
| Max. dia. on slitting blade          | 2.5mm   |
| Cutting Speed Max. dependant on dia. | 960/min |

## CLIFFORD AGENTS



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[www.cliffeng.com/contacts](http://www.cliffeng.com/contacts)

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