



## Freeze Trim Cryogenic Rubber Deflashing Machine

High speed, quality-enhancing automated rubber deflashing



...a lifetime of reliability and support



## Cryogenic Rubber Deflashing

The Barwell Freeze Trim is a high output, automated and cost cutting method of deflashing using cryogenic freezing. Cryogenics is by far the most versatile and effective option of deflashing rubber parts.

- Suitable for most rubber, plastic, die-cast zinc or rubber-metal products
- Single person operation
- Expertly deflashes parts using cryogenic freezing
- Separates the sprue and/or waste material from the finished parts
- Exceptionally fast and automated and safe, improving operational efficiency
- Provides a pristine quality finish

## barwell Freeze Trim

Cryogenic deflashing



## FEATURES

- Available in four capacity sizes
- Automatic powered door available on selected models
- 20,000 rpm impeller provides high 'impact' speed and is hardened for longer life
- High-quality AC motors and Omron HMI, inverters and PLC
- PLC control allows easy operation
- In-line flash and media separator
- Thick insulation maintains cryogenic temperature
- Media dryer not required
- Long media life (approx. 300 cycles)
- Media and flash exit to Separator
- Suitable for media size between 0.15mm – 1mm
- Only three moving 'wear' parts
- Supplied with a Dry Air System to filter moisture from the air supply and release a dry compressed air to assist media flow



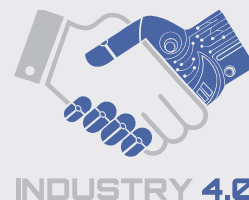
## USER-OPERATOR INTERFACE

- An easy to use large colour touch-screen operator interface, including multi-language support and QWERTY keypad
- 2000 item product database enables a large number of cycles to be pre-set, making production quicker and consistent
- High-quality Omron HMI interface with manual or automatic operation, features include: daily maintenance checks, password protection, process checklist, and onscreen diagnostics

OMRON

## OPTIONS

- Barcode reader option aids production control
- Also available with BFT Smart Cryogenic Deflashing Machine option or Industry 4.0 factories with features including:
  - Process data capture
  - Machine e-mailing of fault and maintenance prompts to designated personnel
  - Gateway protected access for remote support



## BENEFITS

### Exceptional part finish quality

A very high-quality product is produced as all parts are exposed to blast media, ensuring an even, clean and complete removal of inner and outer flash in one operation. Surface damage risk is virtually eliminated.



### Increased production and processing flexibility

The fully automated process significantly decreases deflashing time, increasing production capacity when compared to other methods. It also offers complete flexibility to multi-material processors.

### Reliable and simple operation with easy maintenance

Installation is simple, and minimal user training is required. It is easy to maintain and clean.

Time, tumble speed and media velocity can be programmed, simplified by the latest PLC controls and touch screen interface, giving access to a 2000 item database for easy retrieval of required set-up.

### Reduced operational costs

Major savings can be made on labour costs, due to the speed of operation. Rejects are also dramatically reduced because of the higher and more consistent finish quality. Savings can also be made as the unit takes up considerably less factory space than most other processes.

The interface has a 'Cool-off' function, pre-set at  $-5^{\circ}\text{C}$ . This allows the chamber to keep cool and not form moisture when operators are on breaks or between batches, saving time on their return to start up production again.

The use of 99.99% dry air to circulate the media increases media life over the Auger method. It is also a quicker process due to shorter freezing time and faster speed.

The dryer unit provides the following benefits:

- Reduces current nitrogen consumption up to 15%
- Simply connects to factory air supply
- Creates less moisture in the system resulting in a reduction in blockages and downtime
- Stronger media flow which can lead to reduced cycle time

### Energy and Power consumption

Freeze Trims have very low power consumption and  $\text{LN}_2$  usage due to its efficient, compact design and excellent thermal characteristics.

### Safe and environmentally friendly

Blast media is reusable as it can be separated from the flash after production. The use of 99.99% dry air helps to avoid media sticking from moisture. The media can be used for approx. 300 cycles.

Liquid nitrogen is safely recycled or vented into the atmosphere. Operators cannot cut their hands as with manual trimming, and there are no safety concerns such as; splash backs from molten baths or harmful toxic fumes or dust as with chemicals.

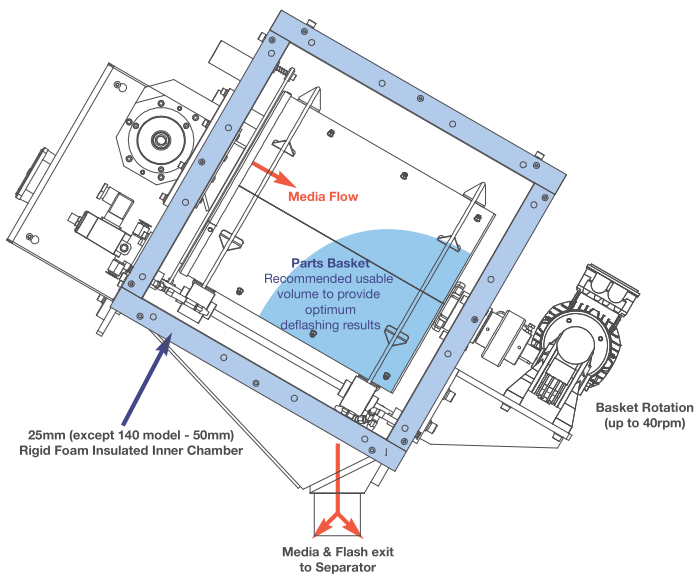


## APPLICATIONS

The Freeze Trim provides the user with complete processing flexibility, and it is ideal for those with large volume production, multiple part sizes and complexities (including those up to 250mm dia.), different materials, or when a high quality and pristine finish is paramount.

- Most small to large rubber and plastic parts
- Ideal for 'O' rings
- Metal deburring
- Zinc and aluminium castings
- Electronic components
- Medical items

The Barwell Freeze Trim is ideal for use in the automotive, oil and gas, aerospace, medical, electronics, and general rubber sectors.



## HOW DOES THE FREEZE TRIM WORK?

1. Moulded parts are placed in a perforated stainless steel parts basket and inserted into the blast chamber. The basket should only be filled one-third full, as parts need to be allowed to tumble and move freely to effectively deflash in the chamber.
2. Liquid nitrogen ( $LN_2$ ) is injected into a highly insulated chamber in which moulded rubber parts are tumbled and rapidly cooled.
3. Plastic shot is then projected at the tumbling parts using a high-speed impeller which directs and throws the polycarbonate media into the rotating basket, breaking off the brittle flash on impact, leaving a high quality, flashless moulding.
4. The deflashed parts remain in the basket and the machine then separates the reusable plastic shot from the rubber debris (flash and dust), except on the 10 litre table-top machine, where it is re-circulated.

## WHAT IS FLASH?

During the production of a rubber product, layers or flaps of unwanted material are created due to material overflow from within the mould cavity. This excess material is commonly known as 'flash'.

Rubber flash has two elements to it - the film of rubber projecting from the part along the mould's parting line (flash line) and the thickness of the flash.

The excess material (or flash) almost always needs to be effectively removed before the product is deemed to be in an aesthetically acceptable or 'fit for purpose' condition.



## HOW IS 'FLASH' REMOVED?

Many factories still use manual methods to deflash their products, such as hand or mechanically assisted trimming, buffing or grinding. Some companies will also use more hazardous options like chemicals for this process.



## Problems with these methods

In most instances, these traditional methods are tedious, time-consuming, labour-intensive or even dangerous, and are not always effective in producing a high quality finished part with all the flash sufficiently removed.

The Freeze Trim offers a quick, automated and cost-effective solution to separate the sprue and/or the unwanted flash surrounding the part.

It provides processors with significant cost, time and quality and safety advantages over hand-cutting, grinding, chemical or tumbling methods of deflashing.

## USE IN CONJUNCTION WITH A BARWELL SPIN TRIM

A Freeze Trim will significantly reduce operational costs compared to traditional methods of deflashing. It can also be used in conjunction with a Spin Trim for further savings. The benefit of having a two-stage process is that it reduces the time taken during cryogenic deflashing, including the amount of liquid nitrogen used, reducing operational costs.

Using a Spin Trim can remove up to 90% of waste rubber, meaning you can then put more product into the Freeze Trim and also reduce cycle times by up to 50%.

It also means that a higher quality part is produced as the cryogenic and media blasting process can concentrate on polishing and fine trimming.



**barwell Spin Trim**  
Rubber deflashing machine

## SAFETY

Health and safety is a primary concern for those responsible for machine maintenance and operator safety.

Barwell machines are manufactured to comply with international safety standards and are supplied with a number of features to ensure safe operation.

The Freeze Trim is CE compliant with many built-in safety features.



## SUPPORT

Barwell has always taken the approach that a customer needs to be supported for the lifetime of the machine.

- Commissioning, training and servicing packages available
- Genuine spare parts
- Technical support

**barwell Support**  
Advice | Spares | Service

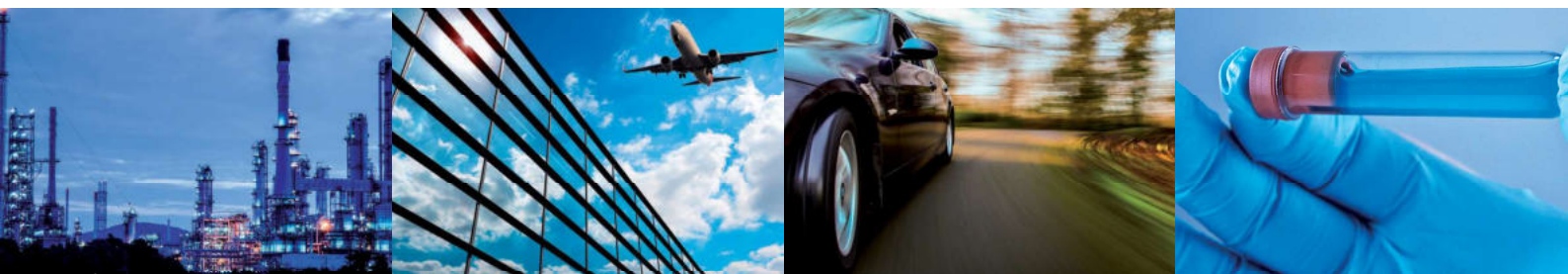
## Technical Data

| Feature                                                | BFT10                            | BFT20                              | BFT40                              | BFT40AD                            | BFT140                             |
|--------------------------------------------------------|----------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Unit Length / Width / Height (mm)                      | 1000 / 900 / 1045                | 1340 / 1185 / 2080                 | 1340 / 1185 / 2080                 | 1340 / 1325 / 2080                 | 1440 / 1625 / 2420                 |
| Unit Weight (Kg)                                       | 300                              | 600                                | 600                                | 750                                | 1000                               |
| Dry Air System Provided                                | YES                              | YES                                | YES                                | YES                                | YES                                |
| Refrigerant (Liquid Nitrogen LN <sub>2</sub> @ 212°C ) | LN <sub>2</sub> @ 2 bar (30 psi) | LN <sub>2</sub> @ 3.5 bar (50 psi) | LN <sub>2</sub> @ 3.5 bar (50 psi) | LN <sub>2</sub> @ 3.5 bar (50 psi) | LN <sub>2</sub> @ 3.5 bar (50 psi) |
| Media Flow System (Dry Air)                            | @ 1.4 bar (20 psi)               | @ 1.4 bar (20 psi)                 | @ 1.4 bar (20 psi)                 | @ 1.4 bar (20 psi)                 | @ 1.4 bar (20 psi)                 |
| Parts Basket Ø / Depth (mm)                            | 250 / 250                        | 300 / 300                          | 330 / 400                          | 330 / 400                          | 610 / 480                          |
| Powered Door                                           | -                                | -                                  | -                                  | YES                                | YES                                |
| Basket Standard Perforation (mm)                       | 6                                | 6                                  | 6                                  | 6                                  | 10                                 |
| Max. Basket Volume / Usable (Litres)                   | 10 / 3                           | 20 / 7                             | 35 / 12                            | 35 / 12                            | 140 / 50                           |
| Media Throw Wheel Ø (mm)                               | 100                              | 100                                | 100                                | 100                                | 150                                |
| Media Throw Wheel Speed (rpm)                          | 20,000                           | 20,000                             | 20,000                             | 20,000                             | 18,000                             |
| Media Type (suitable for media from 0.15mm to 1.00mm)  | Polycarbonate                    | Polycarbonate                      | Polycarbonate                      | Polycarbonate                      | Polycarbonate                      |
| HMI Touch Screen Size                                  | 5" colour                        | 8" colour                          | 8" colour                          | 8" colour                          | 8" colour                          |
| Total Power (Kw)                                       | 2                                | 3                                  | 3                                  | 3                                  | 4                                  |
| Air Supply Volume (CFM / m <sup>3</sup> hr)            | 24 / 40                          | 28 / 48                            | 28 / 48                            | 28 / 48                            | 30 / 51                            |
| Air Supply Pressure (bar / psi)                        | 6 / 87                           | 6 / 87                             | 6 / 87                             | 6 / 87                             | 7 / 100                            |

| Liquid Nitrogen (LN <sub>2</sub> ) Cycle Time and Consumption (Litres) |                  |     |      |      |
|------------------------------------------------------------------------|------------------|-----|------|------|
| Cycle Time (min.)                                                      | Temperature (°C) |     |      |      |
|                                                                        | -45              | -75 | -100 | -120 |
| 5                                                                      | 2.1              | 4.2 | 6.3  | 7.7  |
| 10                                                                     | 4.9              | 5.6 | 7.7  | 9.1  |
| 15                                                                     | 6.3              | 8.4 | 10.5 | 11.9 |

| Liquid Nitrogen (LN <sub>2</sub> ) Cool Down Time and Consumption |             |                      |
|-------------------------------------------------------------------|-------------|----------------------|
| Temperature (°C) range                                            | Time (min.) | Consumption (Litres) |
| 26 to - 45                                                        | 0.5         | 3.5                  |
| 26 to - 75                                                        | 1.2         | 4.2                  |
| 26 to - 100                                                       | 1.4         | 4.9                  |
| 26 to - 120                                                       | 1.5         | 6.0                  |

**IMPORTANT:** Thickness of flash should not exceed 0.1mm or deflashing may not be possible. Note: Calculated estimates for BFT40 based nominal basket load factor.



### Barwell Global Ltd.

Unit 1, 9 Burrell Road, St. Ives,  
Cambridgeshire, PE27 3LE United Kingdom

✉ info@barwell.com  
☎ +44 (0) 1480 832 860  
🌐 www.barwell.com

### Barwell Global USA

2868 Westway Drive, Unit E,  
Brunswick, Ohio 44212-5661 USA

✉ info@barwellusa.com  
☎ +1 330 225 9557  
🌐 www.barwellusa.com

**barwell**

...a lifetime of reliability and support