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extruder drives

mixer drives

mill drives

### The rubber and plastics industry driven by David Brown

calender drives

standard and customised reducers

drop-in replacements and upgrades

service and repair



## Product catalogue



**Gearbox**  
Emergency helpline  
T +44 (0) 1484 465666

Print date 10/14 Revision date 10/14

Global version

Moventas approved service and repair centre

The information contained in this catalogue has been obtained through sources deemed reliable but cannot be guaranteed as to its accuracy. Any information of special interest should be obtained through independent verification and consulted with a David Brown representative. In the interest of continuous development, David Brown reserves the right to alter designs and specifications without prior notice. David Brown is certified to ISO9001:2008. Your David Brown representative should be consulted prior to product selection and use. 3X terms and conditions apply. Contact your local David Brown representative for details and to check eligibility.

High quality | customer engineered | exceeding expectations



## The rubber and plastics industry driven by David Brown

David Brown offers an extensive product range to serve the rubber and plastics industry, including universal standard units through to specialist custom engineered orders. We can meet your needs whether that be one gearbox drive system or thousands. David Brown is committed to being the best in the industry.

Through its historical WECO brand, David Brown has built long standing relationships with both OEMs and global end users. With increasing demands for efficiency and productivity in an increasingly competitive global market place, here at David Brown we understand the critical nature of gearboxes to your process with no room for compromise on performance or reliability. In a world economy reliant on rubber and plastics products, failure is not an option.

### Geared for rubber and plastics excellence

- Local engineering support in the same time zone, ensuring a quick turn-around
- Best cost, quality and delivery times in the industry
- In-house test rig capabilities
- Global network of service centres, supported by strategically placed manufacturing facilities
- Repair to all David Brown and third party gearboxes
- Manufacturing and supply chain capability optimised to deliver industry expectations at optimum cost

### Custom engineering capabilities

- Extensive range of products with applications across the whole process
- Global supply chains across five continents including manufacturing and service capabilities
- Bespoke design and repair of gearboxes for the rubber and plastics industry: engineering, design, manufacturing, service and sales
- State of the art design tools, manufacturing equipment and quality processes

Applying **our expertise**  
across the entire  
**rubber and plastics** production process.



### Internal mixing

#### Products

- "Unidrive" twin output drives
- Change speed options



### External mixing / milling

#### Products

- Twin outputs
- Geared friction ratio drives
- Independent drive twin output drives



### Extrusion

#### Products

- Integral thrust bearings
- Hollow output shaft options
- Customised to match customer's equipment



### Calendering

#### Products

- Inclined Z configuration drives
- L and inverted L configuration drives



### Service and repair

#### Products

- Onsite maintenance
- Spares and repairs
- Support for David Brown and non David Brown products

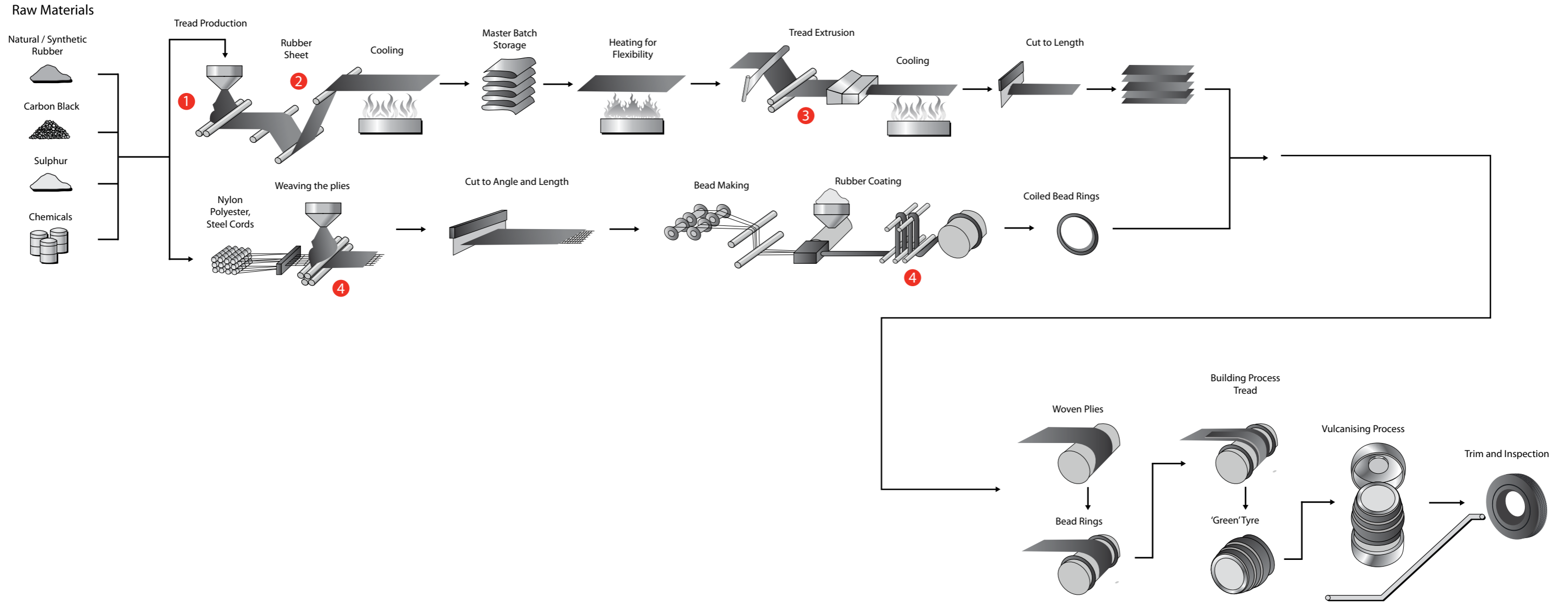


### Drop in replacement and upgrade

#### Products

- Drop in replacements for both David Brown and non David Brown products
- Ability to increase capacity within same space envelope

# Tyre manufacturing process



- ① Custom designed mixer drives with single or twin output shafts
- ② Mill drives with twin output shafts
- ③ Extruder drives available with hollow shafts, designed to handle high thrust loads
- ④ Calender drives with multiple output shafts as required

## Proven engineering expertise

David Brown has a dedicated global team of design and application engineers, experienced in providing tailored solutions for all power transmission applications in the rubber and plastics industry.

All designs are optimised using state of the art design tools and crafted using the latest manufacturing equipment.

### Housings, couplings and shafts

- Designed to be thermally efficient
- Using the latest software design tools for FEA analysis FEA and 3D modelling

### Gear design

- David Brown design to AS/AGMA, JIS, DIN or ISO standards
- Tooth modifications to achieve optimal gear load conditions
- Using the latest software design tools for power transmission vibration and noise analysis

## Assembly and load testing

All gearboxes and associated products follow strict quality control guidelines and review before being shipped to our customers worldwide.

Our full load testing capabilities include the measurement of temperature, vibration, noise and provision for supply of full inspection and documentation packs.

David Brown offers no-load spin testing and full scale load testing of stand alone gear units or complete drive assemblies depending on customer requirements.

Testing facilities worldwide with capabilities to test gearboxes exceeding 3MW.

## State of the art manufacturing capabilities

David Brown has global engineering and manufacturing facilities equipped with the latest gear manufacturing equipment and machine tools.

- David Brown is fully accredited to ISO 9001
- Worldwide manufacturing facilities
- Girth gears to 14.4m in diameter and up to 105,000kg in weight
- Pinions tailored to suit your requirements
- Annulus / internal ring gears up to 12m in diameter
- Induction hardening of external or internal gears to 4.5m in diameter
- Case carburising to 3m diameter and 4.5m length
- Nitrided heat treatment can be available on request
- David Brown operates a zero defect policy
- Gear units up to 250 tonnes

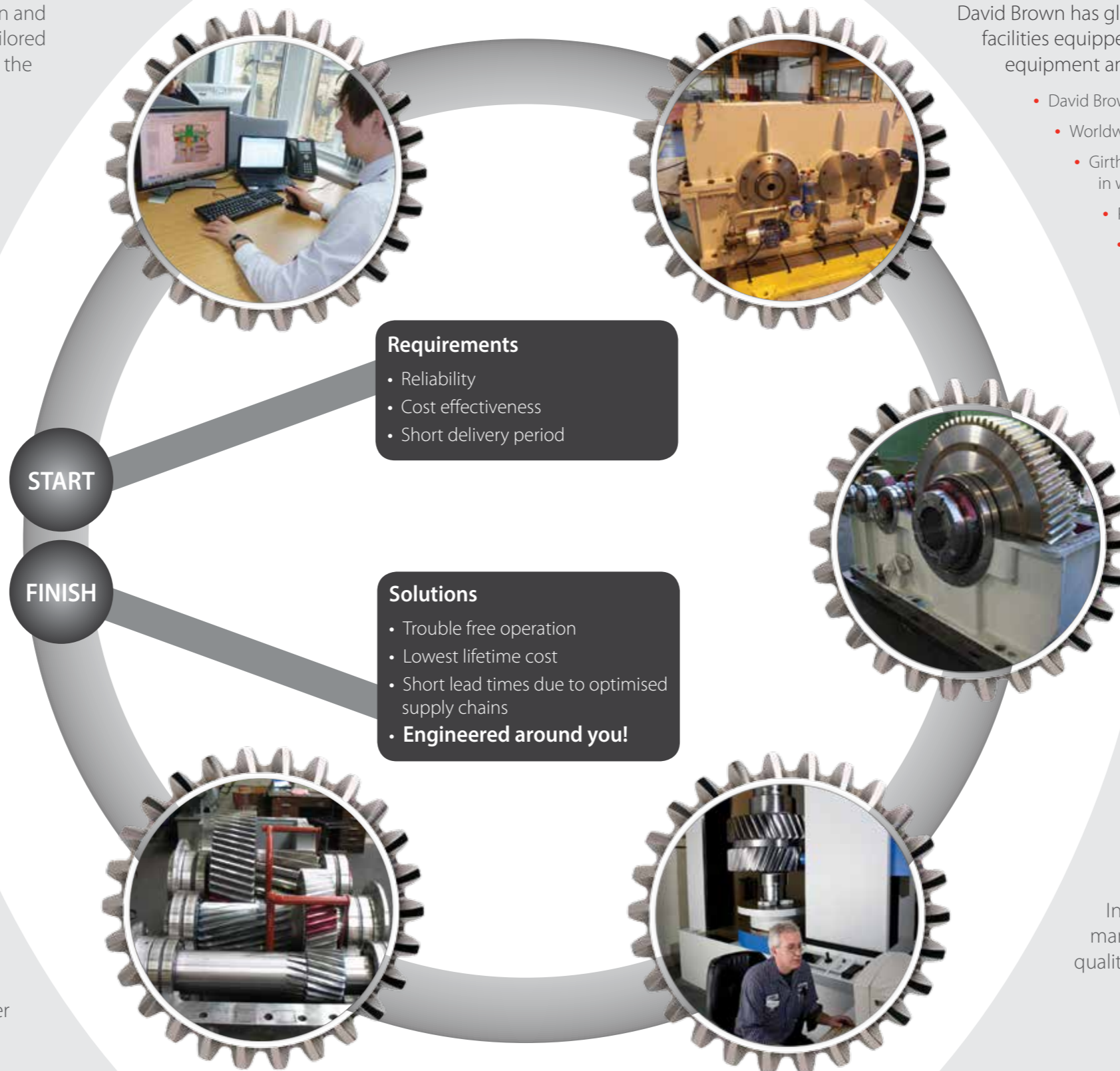
## Quality control

Equipped with the latest gear inspection equipment available.

Modern manufacturing and service facilities showcase our abilities.

David Brown utilises the latest onboard and stand alone gear measurement technology.

Inspection equipment is integrated with manufacturing processes to ensure optimum quality at minimum lead time.



With proven expertise and global capabilities,  
David Brown gives you peace of mind  
throughout the whole process



## Engineering and manufacturing capabilities

David Brown has a dedicated global team of mining design and application engineers to provide around the clock support. David Brown mining products are designed using state of the art design software for gears, shafts and housings, aiming to be your complete gearing authority.

We have skilled technicians and engineers ready to solve your gearbox and associated product needs. We can design from scratch or service and upgrade an existing product. Whether you wish to change the ratio or an existing gearbox, David Brown is your one stop gearbox shop. We can evaluate your current gearbox and replacements which offer higher ratings to maximise your process. Send us your gearbox during a regular

shutdown and we will evaluate its condition. We can make drop-in assemblies that will help minimise downtime.

A team of skilled professionals provide expert assistance who can either work from detailed engineered drawings or from sample pieces. If required, original engineered specifications and drawings can be designed and developed. David Brown is your complete mining solution provider however complex or time dependant your requirements are.

David Brown manufactures gears and gearboxes to any rating or gear grade currently in existence and draw on their wealth of engineering expertise across the world.

## Quality and testing

David Brown utilises some of the industry's most sophisticated gear inspection machines. This ensures David Brown products are of the highest quality and robustness.

Our fully automatic CNC controlled gear measuring machines are designed for larger work piece diameters up to 3000mm and 14m on board measuring.

These measuring machines are suitable for testing spur and helical gears as well as hobs, shaper cutters, worm gears and bevel gears. The machines are also critical to establish the exact tooth profile of the sample part and to ensure manufacturing processes are constantly checked against design intent.

David Brown offers full scale load testing of gearbox products if requested by customers.

No-load spin testing and full scale load testing of stand alone gear units or complete HV drive assemblies are available. For more information, ask a David Brown representative.

# Mixers and Mills

Industry leading references | flexible designs | reliable solutions



Working with the world's leading Rubber equipment OEM's and end users producing rubber products, David Brown has developed a range of product solutions for mixers and mills used in rubber preparation.

Working with mixer OEMs on "Banbury" type enclosed mixers has enabled us to develop a range of drives for this application. These units have twin contra-rotating output shafts to drive the interlinked mixer rotors.

Process developments to increase efficiency have led to increasing power requirements for mixing applications. The David Brown range has followed suit, with power capacities up to 3000kW.

For enclosed mixers, David Brown has units with single or double input shafts, allowing greater flexibility in positioning of motors.

Output shafts are normally geared together to provide contra-rotating same speed output shafts. A typical mixer package can also include indexing couplings to allow for accurate relative positioning of the drives to the rotors. Options are also available to allow independently driven output shafts, where the synchronisation of the output shafts is achieved by electronic control of the motors.

### Reference list includes:

| Customer     | End user                            | Configuration                   | Power (kW) | Date         |
|--------------|-------------------------------------|---------------------------------|------------|--------------|
| Farrell      | Chemopetro Czech Republic           | Banbury mixer                   | 1200       | 1996         |
| Farrell      | Poland                              | F370                            | 1400       | 1983         |
| Farrell      | UK                                  | F270                            | 1500       | 1978         |
| Francis Shaw | Portugal                            | Enclosed mixer                  | 570        | 1992         |
| Francis Shaw | Russia                              | 2 speed                         | 525        | 1988         |
| Francis Shaw | Saiag Spain                         | Enclosed mixer                  | 1400       | 1987         |
| Francis Shaw | SP tyres UK                         | Enclosed mixer                  | 1500       | 1987         |
| Pirelli      | Italy                               | Enclosed mixer                  | 2750       | 1988         |
| Goodyear     | Turkey                              | F270 2 speed                    | 750        | 1990         |
| Michelin     | US and Germany                      | H4T800 mixer                    | 2x1050     | 2005 onwards |
| Michelin     | US, Brazil                          | H5T770 mixer                    | 2x1500     | 2009 onwards |
| Michelin     | Poland, Brazil                      | K4T845 mill with friction ratio | 1050       | 2006 onwards |
| Michelin     | USA                                 | K4T710 mill with friction ratio | 850        | 2000         |
| Pirelli      | Italy, Brazil, Argentina and Russia | Enclosed mixer                  | 2500       | 1988         |
| Michelin     | USA                                 | 3 speed mixer                   | 300        | 2005         |



# Mixers and Mills

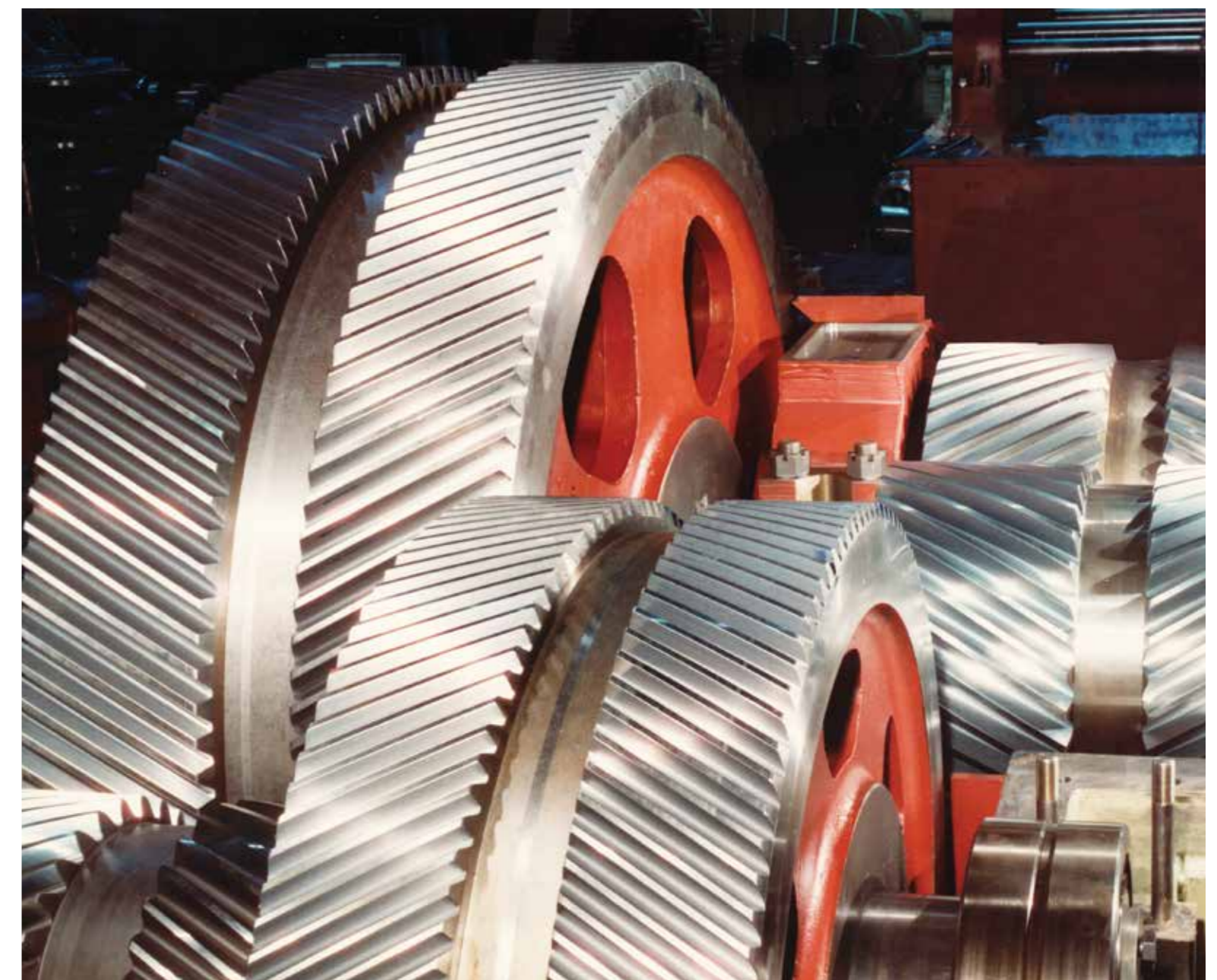
Industry leading references | flexible designs | reliable solutions

Independent drives with twin motor inputs and twin non-g geared outputs offer even greater flexibility for process control, offering variable friction ratios to the mill rolls. David Brown can offer complete packages including couplings, baseplates and onboard lubrication systems, offering a one stop shop for rubber mixing applications.

For external mixers (mill drives) special configurations have been developed to give a small ratio difference (friction ratio) between the twin rollers required for effective milling of rubber compounds.

## Technologies

- 1 Motor - 2 outputs - output speed with "ISO speed" or with friction ratio
- 2 Motor - 2 outputs - output speed with "ISO speed" or with friction ratio
- 2 Motor, each of them driving an output independently - friction ratio can be set up through the inverter on the motors



# Extruders

Highly Engineered | flexible design | industry leading references



David Brown has a long history of supply of special purpose gear units for extrusion processes in the rubber and plastics industry, particularly in rubber extrusion for tyre manufacture.

Through long standing relationships with both OEMs and major end users, David Brown has optimised their gearbox solutions to their process needs. The resulting range of reducers allows us to address all extrusion applications, optimising pre-engineered designs and customising to suit the application.

In the extrusion process, as well as transmitting the high torque to drive the extruder screws, the gearbox has to react the thrust load from the extruder as the material is forced through dies. The David Brown range of extruder gearboxes incorporates high capacity rolling element thrust bearings, fitted into a rigid housing to react to these loads through the casing, without risk of internal misalignment of the gears.

The output stage of the reducer is custom designed to interface exactly with the customer's extruder. This customisation will typically include an accurately machined mounting flange, precision machined to locate the gearbox onto the extruder body. The output shaft can include features to directly drive the extruder screw, including hollow shaft versions. The output shaft can also include a gear to provide an auxiliary drive directly from the gearbox output shaft.

David Brown extruder drives can be supplied with integral lubrication systems allowing easy installation.

## Key features

- Integral thrust bearings
- Lubrication system built onto gearbox
- Hollow output shafts to suit customer's extruder configuration
- Rigid thrust bearing housings in both cast and fabricated configurations
- External drive teeth on output shaft
- Support high thrust loads

## Key benefits

- Single source of supply
- No external oil connections, self-contained unit
- Complete design flexibility to incorporate extruder design
- Free standing floor mounted unit

## Reference list includes:

| Customer        | End user                  | Power (kW) | Date         |
|-----------------|---------------------------|------------|--------------|
| Baker Perkins   | UK plastics factory       | Various    | 2007         |
| Iddon Brothers  | UK rubber processor       | 95         | 1995         |
| Farrel          | UK tyre plant             | 125        | 1995         |
| Farrel          | UK BASF                   | 2000       | 1998         |
| Farrel          | Poland tyre plant         | 260        | 1983         |
| Francis Shaw    | Various                   | 37 to 260  | 1980 onwards |
| Farrel Bridge   | UK tyre manufacturer      | 375        | 1988         |
| APV Baker       | UK plastics plants        | various    | 1990         |
| Carter Brothers | Indonesia tyre plants     | 562        | 1995         |
| Rockwell        | UK plastics plants        | Various    | 1990         |
| Michelin        | Poland, Thailand, Brazil, | 590        | 2006 onwards |
| Michelin        | Poland, Thailand, Brazil, | 300        | 2006 onwards |
| Michelin        | Michelin various plants   | 75         | 1990 onwards |





# Calender

Highly Engineered | industry leading references | customised solution



The David Brown range of rubber and plastics products includes special purpose gear units for driving calenders.

Typical calender applications will see multiple output shafts, which drive the calender rolls. The rolls are used to process premixed rubber into continuous sheets, often incorporating strengthening materials such as fibres and cords, for example when producing tyres and conveyor belting.

Units can be custom designed, offering a range of powers and ratios and designed for different configurations of calendars. Options are available with multiple outputs to drive calender rolls in various configurations:

- Two roll vertical
- Two roll horizontal
- Three roll offset
- Four roll inverted 'L'
- Four roll 'S' and 'Z'
- Two roll offset
- Three roll vertical
- Four roll vertical
- Four roll 'L'
- Four roll inclined 'Z'

## Reference list includes:

| Customer       | Configuration       | Date |
|----------------|---------------------|------|
| Iddon Brothers | 3 roll              | 1997 |
| Iddon Brothers | 4 roll 'Z'          | 1990 |
| David Bridge   | Inverted 'L'        | 1970 |
| David Bridge   | 4 roll 'Z'          | 1971 |
| Farrell Bridge | Inverted 'L'        | 1973 |
| Farrell        | 4 roll inverted 'L' | 1989 |
| Farrell        | Inclined 'Z'        | 1970 |

**Calender** drives are available in a number of configurations, **options** are available for **multiple** outputs.

**Calender** units are **flexible and custom** designed to meet your specific **requirements**.



# Drop in replacements and upgrades

Honest | capable | indepth understanding

With confidence, David Brown can ensure units can be quickly changed over without alteration of the mountings, this can allow you to improve the productivity of your existing process, whilst ensuring equal or better reliability than the original product.

Long experience of the arduous duty experienced in the rubber and plastics industry means David Brown has an in depth understanding of the specific problems encountered and is able to create engineering solutions to improve the capability and reliability of the gearboxes in service.

For existing installations such as mixer drivers, replacement units can be reconfigured to give greater powers, allowing increases in speed or mixing torque, whilst fitting into the same space and in many cases with interchangeable mounting positions.

Where necessary David Brown can offer upgrades to fit into existing foundations. Replacement units can have a higher capacity than the originals by a combination of design changes, use of more advanced manufacturing techniques, and superior materials.



## Retrofit replacement gearboxes

David Brown's rapid engineering capabilities mean they can offer "drop in replacement" gear units, for all brands of gearboxes. By ensuring total dimensional interchangeability of shaft sizes and positions, and commonality of holding down bolt positions, we can ensure the new gearbox can be installed without modifications to foundations and couplings and without the need to modify or re-position other critical equipment. This minimises the risk and time for re-installation of replacements for aging gearboxes, whatever the application.



## Upgrading equipment and gearboxes

If your process needs additional capability David Brown can provide "drop in replacement" gear units with modern manufacturing techniques and improvements in materials and heat treatment technology. This means the replacement unit can be upgraded from the original design, without changing the space requirements or interfaces.



## Overhaul / upgrades

Even where gearboxes are overhauled by David Brown, our global experience means we can often offer upgrade capacity or reliability improvements to existing gearboxes, whether David Brown brand or any other manufactures product. Long experience with all major OEMs brands of rubber and plastics processing equipment means we fully understand your process.

# Service and repair driven by David Brown

Assurance | reliability | availability

Global service centres repair and refurbish all gearbox types including worm, planetary, parallel, helical and spur gears. David Brown can repair any damaged gearbox, including the remanufacture of broken or pitted gears and shafts. We can repair any gear unit, in almost any condition, whatever the make or model.

David Brown is recognised as a rubber and plastics gear specialist, with existing facilities operating close to its customers. We focus on building and maintaining long term relationships with all our key channel stakeholders; OEMs, engineering houses, prime maintenance contractors and rubber and plastics operators.



### Advice

- Giving our customers sound technical advice with speedy repairs and upgrades
- Offering the best solution to fix your problem
- Maximise operational ability



### Quotations

- Competitively priced at your specified lead time
- Honest and professional service



### Project management

- Co-ordinate teams to offer repairs and redelivery of your gearbox and other associated products
- Pro-active to work around you
- Fully supported teams, backed by a global network and expertise



### Site services

- Global fast response, with the best dedicated engineers in the industry
- In situ inspections
- Full asset management services
- Warrant parts and services to minimise downtime impact
- Gearbox repairs and upgrades



### Spares

- David Brown can offer spares for all products and manufacture any required parts for non David Brown gear units



### Repairs

- David Brown can offer repairs on or offsite on all makes and models of gearboxes and associated products



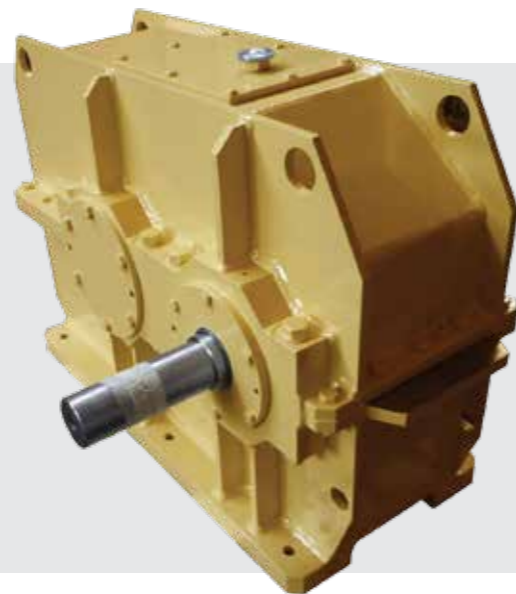


David Brown understands that fast response is key to any customer requiring service and repair. Our dedicated service centre engineers offer support to ensure your gear system, whatever the make or model, is up and running optimising performance and minimising downtime.



Whatever the make or model we can inspect, overhaul and repair your gearbox.

## Lifetime support



We are proudly collaborative and pride ourselves on the long term relationships we have with our customers – even if it's just advice they need, our customers know they can always rely on David Brown to provide an honest, professional perspective.

### In situ inspection

Using the latest in video endoscope technology, our service engineers inspect your gearbox to ensure all components are running smoothly. Regular in situ inspections can help identify issues before they cause failure so they are an ideal way to reduce expenditure on emergency repairs.

### Gearbox repair

Depending on your gearbox make or model, our engineers can often conduct repairs in situ to reduce downtime to its lowest level. If your gearbox cannot be repaired at site, our proposals team will strive to minimise the costs associated with removing your gearbox from its application.

### Gearbox upgrade

To ensure your application operates smoothly, David Brown will thoroughly inspect your gearbox to provide full technical reports and upgrade recommendations for gearboxes experiencing serial failure. Our global manufacturing capability facilitates design and manufacture of new and upgraded components to ISO 9001:2008.

### Strategic spares management

Reducing unscheduled downtime and maintaining high performance operations through strategic component replacement can help you manage your operating costs more effectively.

David Brown provides comprehensive strategic spares management plans designed specifically for your application and its operating environment.

### Full asset management

Our asset management programmes proactively look after your gearbox with regular inspection, carefully scheduled repair and upgrades. As part of your asset management programme we can hold drop in replacement gearboxes to ensure minimal downtime and maximum operational ability.

### 3X extended warranties

David Brown has recently introduced 3X - a full three year extended warranty on any brand of gearbox that's serviced, repaired or upgraded by David Brown at our manufacturing and service facilities across the globe.

With 3X your gearbox will be installed, commissioned and maintained at regular service intervals by a specialist David Brown service engineer local to you. You will have access to round the clock support through our global network of service and repair centres as well as the option to install CMaS, a well proven remote condition monitoring system for extra assurance.



David Brown has more than 150 years experience in supplying specialised gear units for the rubber and plastics industry, giving us worldwide references in almost every application, and a detailed knowledge of the specialised requirements of gear units in this industry.

Our product range includes the full range of custom engineered gearboxes for all applications including some of the largest mixer and mill drives; these can be engineered to meet your new equipment specifications, or designed as drop in solutions to replace existing machinery, often with significant capacity and reliability upgrades.

Our services include on site and off site maintenance and repair services, both for David Brown and competitor gearboxes, including the capability to engineer out known problems and provide product upgrades.



#### Key features

- We offer a 3 year extended warranty package on gearboxes serviced, repaired and upgraded by David Brown
- Available at all David Brown service and manufacturing facilities world-wide
- We can repair, upgrade and maintain any type of gearbox for any industrial application



#### Services offered

- Full diagnostic and performance testing
- Inspection and maintenance with in-depth reporting
- Consulting failure analysis and strain gauging
- Repairs, overhauls and upgrades
- Retrofit replacement gearboxes
- On-site / offsite support
- Asset management
- Strategic spares management
- 3 year warranty package

