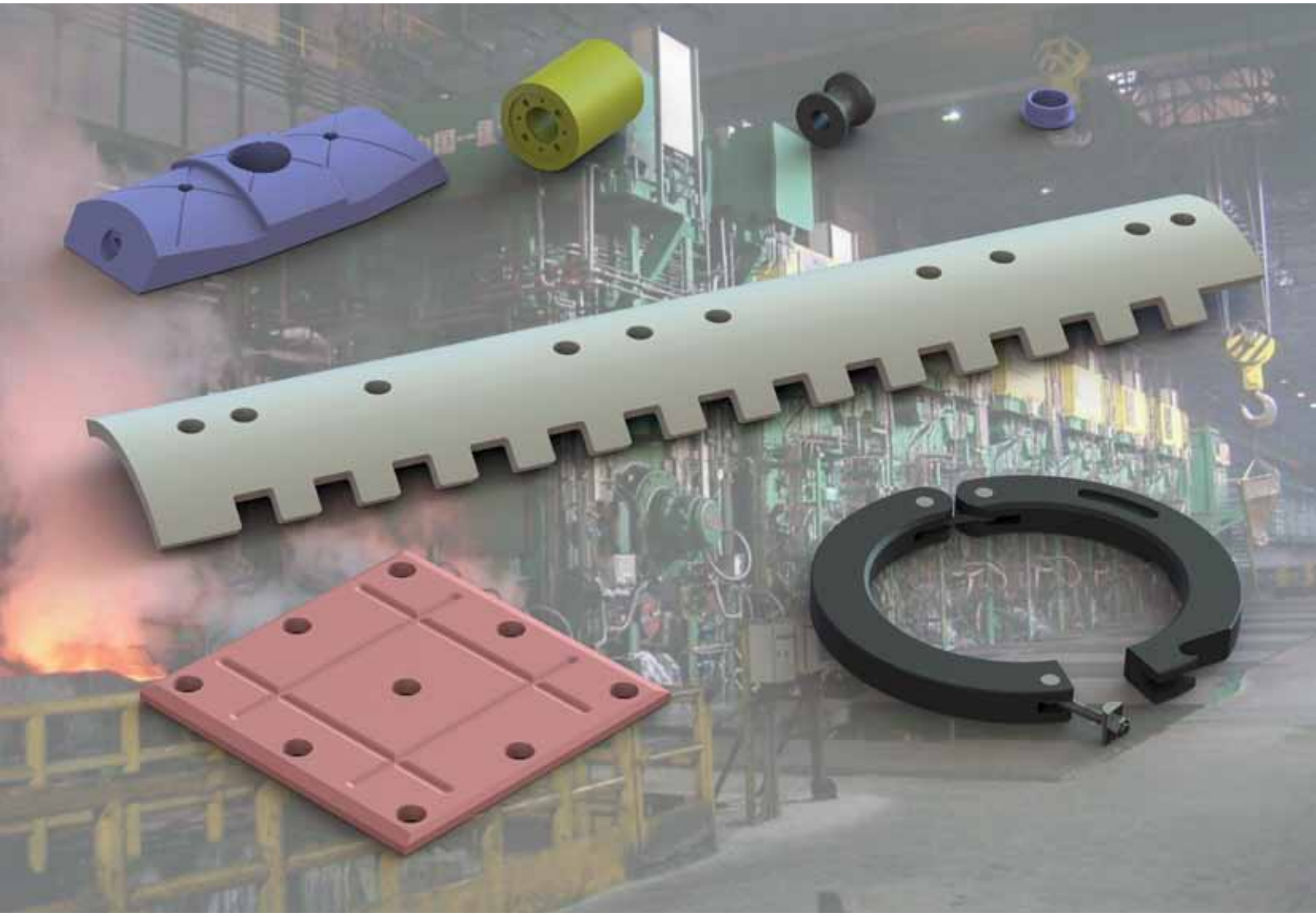
James Walker

# Devlon® engineered thermoplastic components



## Steel & non-ferrous rolling mills

Issue 2

Innovative Thermoplastic Engineering

# Devlon® benefits

## Devlon®

Devlon® materials are amongst the toughest and most hard wearing thermoplastics available. Produced by monomer casting, they provide a comprehensive range of wear resistance, impact strength and moisture absorption properties.

Devlon materials are well suited for use in rolling mills and their secondary processes. They can be found in the roll shop in both hot and cold rolling mills for both ferrous and non-ferrous materials.

## Typical areas of application

- Hot strip rolling mills
- Cold strip rolling mills
- Wire and fine section mills
- Pickling lines
- Zinc coating lines
- Lubricating and de-greasing lines

Devlon materials offer lightweight handling and installation, long operational life and reduced maintenance requirements in many applications.

## Benefits

- Reduced maintenance costs
- Reduced wear on mating parts
- Fast turnaround time
- Elimination of corrosion
- Vibration damping
- Ability to run unlubricated
- Light weight for easy handling and installation
- Longer operational life

## Typical applications

- Thrust collars
- Mandrel segments for uncoiling/recoiling mandrels
- Spindle slippers
- Drive coupling blocks and inserts
- Chock wear plates
- Table and accumulator rolls

## Thrust collars

Designed for and manufactured in Devlon; our thrust collars offer a lightweight yet strong and highly durable solution for metal thrust collar replacement.

Our proven two and three-piece designs can be modified to suit any existing space and configuration, and have proven to be a cost-effective way of reducing maintenance time and improving health and safety through ease of handling and assembly.

James Walker has a wealth of experience in the design and supply of thrust collars to customers around the globe. Leveraging the superior mechanical properties of Devlon materials, including high compressive strength plus impact and abrasion resistance, we are confident of being able to offer a product that will provide excellent longevity and performance in service.

# Devlon® benefits

## Applying the PV factor

A number of applications for engineering plastics found in steel mills have a dynamic component. The following data illustrates the critical relationship between load and relative surface speed for a given component. It is important to note that ambient operating conditions and the geometry of the part must also be considered. It is therefore advised that all applications are reviewed by our technical team when assessing material suitability.

Table 1

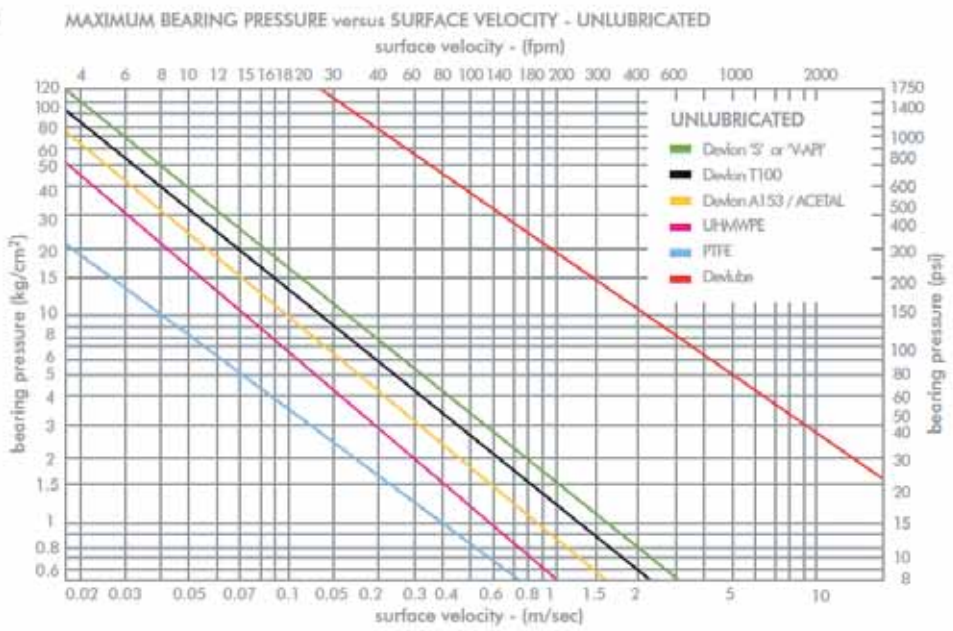
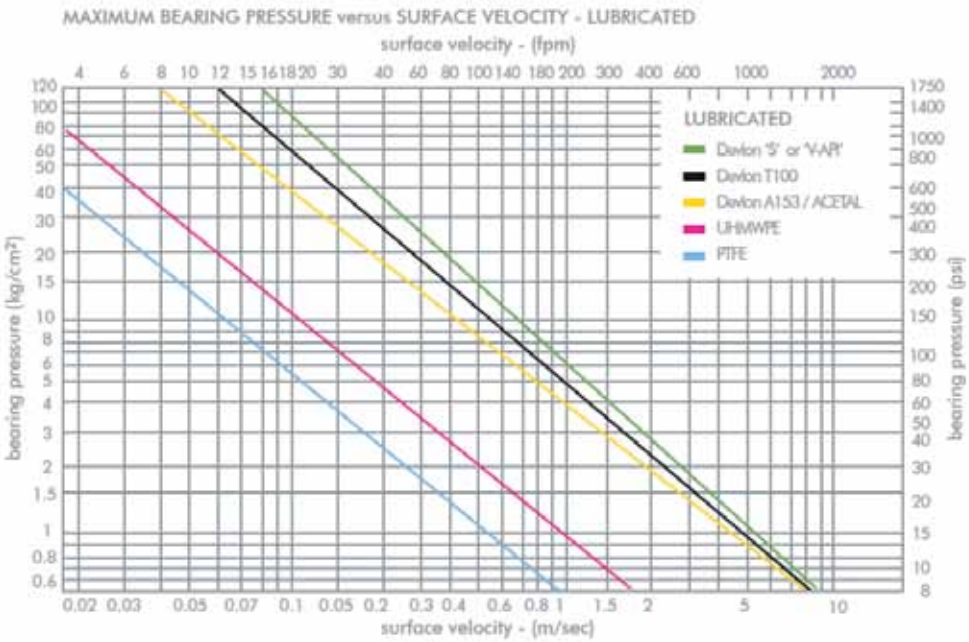



Table 2



# Material characteristics

| ASTM Specification | Physical Property | Units | DEVLON® T100 | DEVLON® S GRADE | DEVLON® V-API | DEVLON® A153 | DEVLUBE® | DEVLON® 6GF30 | NYLON 6G |
|---|---|---|---|---|---|---|---|---|---|
| D638 | Tensile strength at 23°C | MPa<br>psi | 73.9<br>10721 | 81.18<br>11774 | 79.92<br>11592 | 82.74<br>12000 | 70<br>10153 | 180<br>26106 | 60.8<br>8818 |
| D638 | Tensile strength at −40°C | MPa<br>psi | 116.56<br>16906 | 109.78<br>15925 | 109.52<br>15885 | •<br>• | •<br>• | •<br>• | •<br>• |
| D638 | Elongation at 23°C | % | 3.66 | 3.75 | 5.37 | 10 | 4.1 | 3 | 20 |
| D638 | Elongation at break | % | 70 | • | • | • | • | • | 200 |
| D2240 | Hardness | Shore D | 76/78 | 78/80 | 78/80 | 80/85 | 80/84 | 84 | 77 |
| D790 | Flexural strength | MPa<br>psi | 127.48<br>18490 | 125.28<br>18170 | 121.55<br>17630 | 82.37<br>14100 | 90<br>13053 | •<br>• | 87.2<br>12658 |
| D621* | Deformation under load 140 kgf/cm² at 23°C for 24 hours | % | 1.0/2.0 | 1.0/2.0 | 1.0/2.0 | 1.0/3.0 | • | • | 2.0/3.5 |
| D256 | Charpy impact Strength at 23°C | J/m<br>ftlbs/inch | 63.9<br>14.3 | 57.5<br>12.9 | 54.8<br>12.3 | •<br>• | •<br>• | •<br>• | •<br>• |
| D256 | Charpy impact Strength at −40°C | J/m<br>ftlbs/inch | 20.2<br>4.5 | 20.3<br>4.6 | 19.8<br>4.5 | •<br>• | 15<br>3.372 | •<br>• | •<br>• |
| D638 | Modulus of elasticity | MPa<br>psi | 3798<br>550862 | 4055<br>588137 | 4138<br>600175 | 2746<br>398252 | 2800<br>406105 | 9500<br>1377859 | 2745<br>398253 |
| D695 | Compressive strength | MPa<br>psi | 140<br>20305 | 140<br>20305 | 140<br>20305 | •<br>• | 123<br>17795 | •<br>• | •<br>• |
| D695 | Compressive yield strength | MPa<br>psi | 88.9<br>12894 | 91.2<br>13227 | 91.2<br>13227 | •<br>• | •<br>• | •<br>• | •<br>• |
| E831 | Linear thermal expansion coefficient 30–100°C | mm/mm/°C | $1.43 \times 10^{-4}$ | $1.42 \times 10^{-4}$ | $1.11 \times 10^{-4}$ | $0.7 \times 10^{-4}$ | $0.75 \times 10^{-4}$ | $0.25 \times 10^{-4}$ | $0.85 \times 10^{-4}$ |
| D3418 | Melt point | °C | 217 | 214 | 216 | 260 | 220 | 220 | 213 |
| D648* | Heat distortion temperature at 264 psi<br>at 66 psi | °C | 79<br>207 | 98<br>209 | 93<br>209 | 100<br>190 | 120<br>210 | 210<br>220 | 60<br>145 |
| D570 | Max temperature (short term) | °C | 170 | 180 | 190 | 170 | • | 180 | • |
| D570 | Max temperature (long term) | °C | 100 | 105 | 125 | 100 | • | 120 | • |
| D149 | Dielectric strength | kV/mm | >15 | >15 | >15 | >12 | 20 | 25 | >12 |
| D792 | Density | g/cm³ | 1.14 | 1.14 | 1.14 | 1.14 | 1.15 | 1.35 | 1.14 |
| D570 | Water absorption 24 hours | % | 0.12 | 0.1 | 0.105 | 0.6/1.5 | 1 | 0.1 | 2.9 |
| D570 | Water absorption | % | 3 | 3 | 3 | • | • | 1.5-2 | 9 |
| UL 94 | Flammability | Burn rate | SE | V2 | V2 | SE | V2 | HB | SE |

Notes:

This is not a full list of the materials available but is a summary of the typical properties of the most commonly specified grades. For details on the wider range including filled grades please contact James Walker.

The test figures stated are typical values (as opposed to limits) and their aim is to assist the specifier in material selection.

• Denotes no data available at the time of publication. Please contact James Walker for further information.

* Denotes specification now withdrawn, information shown for reference only.

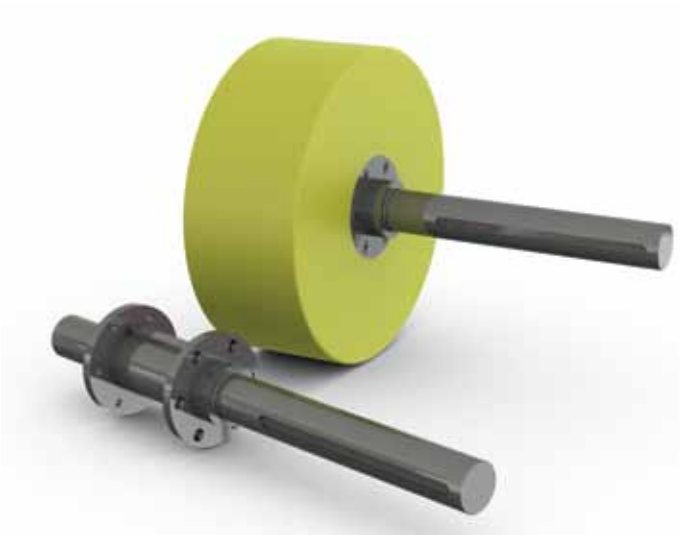
# Thermoplastic components

## Support rollers

Devlon® support rollers have been supplied by James Walker with great success into numerous industries and applications around the world for many years.

Drawing on this breadth of experience and knowledge of both the product and its typical applications, James Walker is able to offer an accurate evaluation of any given application and advise on the best Devlon material grade to suit the specific conditions.

With very low weight compared to metal equivalents, Devlon materials present an attractive prospect offering a number of key benefits including high durability and wear resistance, lower noise in operation and lower wear rates to mating surfaces/products, all without any compromise on function.

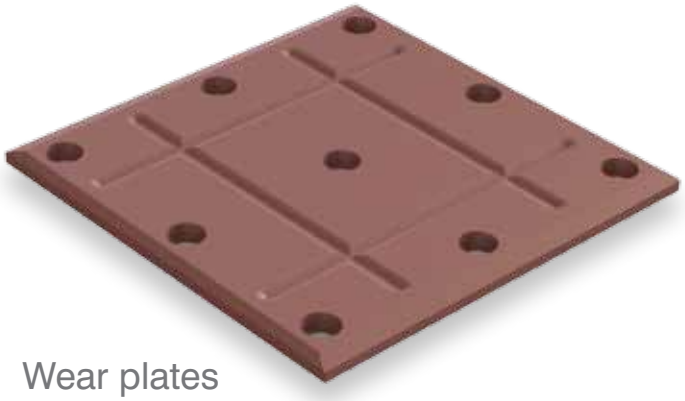


## Slipper pads

Tasked with transferring the drive load to the mill, bearing slipper pads must withstand sustained friction and high loads.

Commonly used brass or equivalent soft metal bearings are prone to stress cracking, leading to increased downtime. They are both costly and difficult to replace due to their weight, which also creates potential health and safety risks.

At approximately 1/7th the weight of the equivalent product in brass, Devlon materials offer much easier handling without detriment to performance and service lifetime. Where deemed appropriate, James Walker can review the specifics of a given application and, comparing to known pressure/velocity limits, advise on material suitability.



## Wear plates

Wear plates perform a vital role in accurately maintaining the position of the roll chock whilst still enabling ease of adjustment to suit the various material gauges produced.

To ensure product quality is maintained and longevity in service is achieved, it is essential that the materials from which these parts are made have a high load capacity and abrasion resistance.

James Walker offers these components in three materials, each application being reviewed independently to ensure the most appropriate material and design is chosen to optimise ease of fitting and service longevity.

James Walker

**James Walker worldwide support & distribution**


**James Walker Asia Pacific**
Tel: +65 6715 6300
*Fax: +65 6715 6301*
Email: sales.sg@jameswalker.biz

**James Walker Australia**
Tel: +61 (0)2 9721 9500
*Fax: +61 (0)2 9721 9580*
Email: sales.au@jameswalker.biz

**James Walker Benelux**
*(Belgium)*
Tel: +32 3 820 7900
*Fax: +32 3 828 5484*
Email: sales.be@jameswalker.biz
*(Netherlands)*
Tel: +31 (0)186 633111
*Fax: +31 (0)186 633110*
Email: sales.nl@jameswalker.biz

**James Walker Brasil**
Tel: +55 11 4392 7360
*Fax: +55 11 4392 5976*
Email: sales.br@jameswalker.biz

**James Walker China**
Tel: +86 21 6876 9351
*Fax: +86 21 6876 9352*
Email: sales.cn@jameswalker.biz

**James Walker Deutschland**
Tel: +49 (0)40 386 0810
*Fax: +49 (0)40 389 3230*
Email: sales.de@jameswalker.biz

**James Walker France**
Tel: +33 (0)437 497 480
*Fax: +33 (0)437 497 483*
Email: sales.fr@jameswalker.biz

**James Walker Iberica**
Tel: +34 94 447 0099
*Fax: +34 94 447 1077*
Email: sales.es@jameswalker.biz

**James Walker Inmarco (India)**
Tel: +91 (0)22 4080 8080
*Fax: +91 (0)22 2859 6220*
Email: info@jwinmarco.com

**James Walker Ireland**
Tel: +353 (0)21 432 3626
*Fax: +353 (0)21 432 3623*
Email: sales.ie@jameswalker.biz

**James Walker Italiana**
Tel: +39 02 257 8308
*Fax: +39 02 263 00487*
Email: sales.it@jameswalker.biz

**James Walker Mfg (USA)**
Tel: +1 708 754 4020
*Fax: +1 708 754 4058*
Email: sales.jwmfg.us@jameswalker.biz

**James Walker New Zealand**
Tel: +64 (0)9 272 1599
*Fax: +64 (0)9 272 3061*
Email: sales.nz@jameswalker.biz

**James Walker Norge**
Tel: +47 22 75 75 00
Email: sales.no@jameswalker.biz

**James Walker Oil & Gas (USA)**
Tel: +1 281 875 0002
*Fax: +1 281 875 0188*
Email: oilandgas@jameswalker.biz

**James Walker South Africa**
Tel: +27 (0)31 304 0770
*Fax: +27 (0)31 304 0791*
Email: sales.za@jameswalker.biz

**James Walker UK**
Tel: +44 (0)1270 536000
*Fax: +44 (0)1270 536100*
Email: sales.uk@jameswalker.biz




www.jameswalker.biz


BP4548 0316/1m
PIIL2968038

Registered Office: Lion House, Oriental Road, Woking, Surrey GU22 8AP, United Kingdom. Reg No. 07393831 England