

# DMH

SOLUTION FOR SEALS



# Innovation is our answer

*DMH, who has grown to a well reputed global player for sophisticated all-in-one solutions and high quality sealing systems.*

*Continuous investments in R&D together with a close and constructive cooperation with our partners has led significantly to gain technology and quality leadership.*

*A top priority goal for the future will remain in creating innovative solutions together with our customers. This commitment includes our engagement to employ our know-how continuously. As a result for these efforts – according to the needs of our customers – attractive products and outstanding service will be the answer to a fluent development at a tearing pace of the market.*

*Become part of a successful partnership!*



[www.dmh.at](http://www.dmh.at)

## Semi-finished materials

To fully utilize the benefits of the DMH SYSTEM, it is essential that the right materials are available in the right quantity and quality.

This will be ensured by our global service network as well as by our large semi-finished product store at our headquarter Traboch and enables an uncomplicated supply to our customers within few days.

Meanwhile we produce over 50 materials in our manufacturing of semi-finished products and working on new processes on a daily basis. Like in our entire range of services – the manufacture here, too – is subjected to strict controls by our own laboratory and by the quality department.

## DMH machines

Quick and easy, yet providing the best quality and dimensional accuracy. Is this a contradiction? Not if you are talking about a DMH SYSTEM. The DMH SYSTEM enables the manufacture of seals and gaskets up to a diameter of 2,500 mm.

Thanks to the extremely user-friendly software that is simple to work with, you can choose from a large number of seal profiles. You can modify the profiles with the help of the software just as you can check for

faults or errors. The documentation and calculation integrated in the DMH Software ensures expeditious preparation of an offer. The materials used are specially oriented at the DMH SYSTEM and optimised with respect to good machining capability on a lathe machine. A system from a single source, from the customer's concept up to the finished seals – quick and easy – the DMH SYSTEM.

Machined seals have not had the best reputation for a long time. In the past 25 years, we have been working on improvements of the quality of those seals. The development could reduce the costs and at the same time improve the quality. Nowadays, machined seals are no longer the choice out of necessity. In contrary, they become the first choice due to their excellent quality. However, it is of particular importance which

materials will be used. DMH has aligned its materials with the profiles and thus top-performance-products can be produced.

According to the high grade of flexibility of the DMH Software nearly all different types of profiles can be produced out of every type of semi-finished product. Contact our specialists for your very own application!

## Seals

# SEMI-FINISHED MATERIALS

Faster, further and higher – these attributes also apply to our industry in which demands and concepts become more and more challenging. The processing times become shorter and shorter due to cost pressure, thus raising the requirements on modern seals. Just imagine that a production plant which was working at 80% of its potential capacity a decade ago, today it has to meet the requirements of working at 100% of its capacity. Of course, a seal needs to keep up with that.

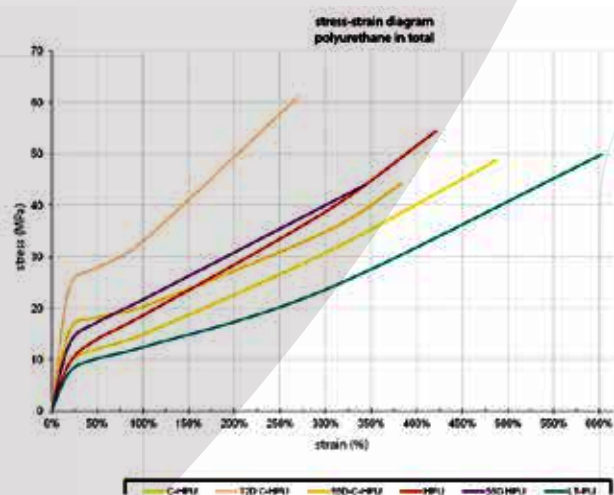
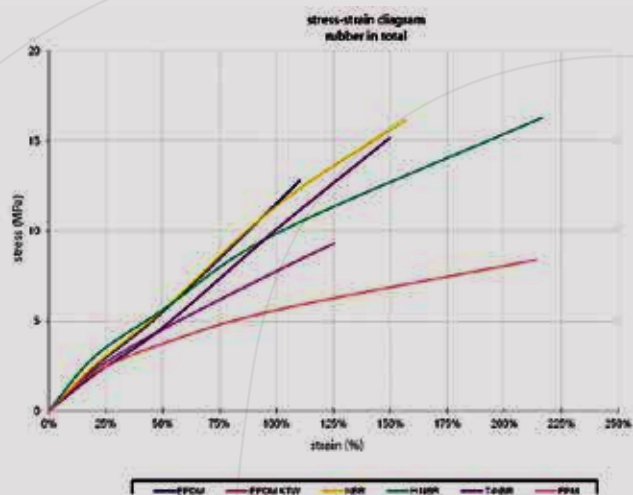
This is where we come into play. We constantly innovate and improve our materials and seal profiles. However, not only the higher demands of the production inspire us, but also our goal to help creating a clean environment. As an entrepreneur family with a long-term perspective we are particularly interested in designing processes and products in an effective and environmental friendly way.

This overall trend towards environmental sustainability proves to be a challenge for us. For example

due to the increased use of biodegradable hydraulic oils, used materials have to meet new requirements. In order to meet these demands, we have invested a lot into research and development. Extensive fundamental research enables our company to adapt the changes quickly. A complete reorganization of our polyurethane production enables us to raise our capabilities for further developments to a higher level. The best examples are our seals which are used in the mining sector. Our partners count on the reliability of our products which provide best results in spite of harsh environmental conditions.

Our R&D team is ready for your requests at any time, so please get in contact with us – together we solve your problems!

Whether it is approvals for the food industry goes according to material or certificates to DIN EN 10204. With DMH you have a partner where you can get all out of one hand.



Our laboratory is equipped with advanced analysis capabilities. We offer them the opportunity of merchantability in media materials, pressure and

temperature investigated. A list of the mechanical, thermal and chemical examination options is available on our website and in our pricelist 2013.

## Polyurethanes

| Thermoplastic Polyurethanes                        | Material number<br>Designation<br>Colour | Hardness | Temperature range °C |     |            | Pressure resistance bar (RT)                  | Main application  | Description  | Resistance   |
|--|--|----------|----------------------|-----|------------|---|---|--|--|
|  |  |          | -                    | +   | Short-term |   |   |  |  |
| HPU (AU*)<br>Hydrolysis-resistant<br>Polyurethane  | 100<br>HPU / U2<br>Red                   | 95A      | -20                  | 115 | 150        | Dynamic:<br>400 bar<br><br>Static:<br>750 bar | O-rings<br>Grooved rings<br>Wipers<br>Slip rings<br><br>Special seals for the food and beverages industry | Compared to all other elastomers, polyurethane elastomers have excellent wear resistance, high level of tear strength and good elasticity. The permeability to gas is as low as that in the case of IIR.<br>The HPU types are all based on a special ester polyol (*), are hydrolysis-resistant and can be used in hot water. HPU 100 and 109 have FDA approval for foodstuffs and the approval for European regulations (10/2011 EC). | <b>Resistant to:</b><br>Pure aliphatic hydrocarbons (e.g. butane, impurities (moisture, alcohols, acidic or alkaline compounds) may corrode polyurethanes!<br>Mineral oils and greases even with critical additives<br>Silicone oils and greases<br>Hot water<br>Resistant to ozone and ageing<br>Synthetic esters<br><br><b>Not resistant to:</b><br>Aromatic solvents<br>Concentrated alcohols<br>Concentrated acids and bases |
|  | 109<br>HPU<br>Natural                    | 95A      | -20                  | 115 | 150        | Dynamic:<br>400 bar<br><br>Static:<br>750 bar |   |  |  |
|  | 104<br>HPU<br>Green                      | 95A      | -20                  | 115 | 150        | Dynamic:<br>400 bar<br><br>Static:<br>750 bar | O-rings<br>Grooved rings<br>Wipers<br>Slip rings  | By default, they do not have FDA approval.   |  |
|  | 103<br>HPU<br>Blue                       |          |                      |     |            |   |   |  |  |
|  | 110<br>HPU 55 / U2 55<br>Yellow          | 55D      | -20                  | 115 | 150        | Dynamic:<br>550 bar<br><br>Static:<br>750 bar | Wipers<br>Face seals (DK108, DS129)<br>Piston seals<br>Backup rings                                       | Depending on the hardness, the friction and wear reduces considerably. The HPU 55 types are excellent for use in piston seals and with high levels of pressure. HPU may be preferred to PTFE in several cases.   |  |
|  | 113<br>HPU 55 / U2 55<br>Blue            |          |                      |     |            |   |   |  |  |
| C-HPU (EU)<br>Hydrolysis-resistant<br>Polyurethane | 120<br>C-HPU<br>Red                      | 96A      | -37                  | 110 | 125        | Dynamic:<br>500 bar<br><br>Static:<br>750 bar | O-rings<br>Static seals<br>Grooved rings<br>Wipers<br>Flat seals  | C-HPU is manufactured using high-quality ether polyol. The material is characterised by its particularly dynamic load-bearing capability and good resistance to water.   | <b>Resistant to:</b><br>Pure aliphatic hydrocarbons (e.g. propane; impurities (moisture, alcohols, acidic or alkaline compounds) may corrode polyurethanes!<br>Mineral oils and greases (some additives may corrode the material).<br>Silicone oils and -greases<br><br><b>Not resistant to:</b><br>Aromatic solvents<br>Concentrated alcohols<br>Concentrated acids and bases   |
|  | 122<br>C-HPU<br>Steel blue               |          |                      |     |            |   |   |  |  |
|  | 123<br>C-HPU<br>Light blue               |          |                      |     |            |   |   |  |  |
|  | 124<br>C-HPU<br>Green                    |          |                      |     |            |   |   |  |  |
|  | 125<br>C-HPU<br>Natural                  |          |                      |     |            |   |   |  |  |
|  | 129<br>C-HPU<br>Natural                  |          |                      |     |            |   |   |  |  |
|  | 130<br>C-HPU 57<br>Yellow                | 57D      | -37                  | 115 | 125        | Dynamic:<br>600 bar                           | DK108 / DS129<br>DA115 wipers and similar backup rings  | Depending on the hardness, the friction and wear reduces considerably. The C-HPU 57 and 72D types are excellent to use as piston seals and with high levels of pressure. C-HPU may be preferred to PTFE in several cases. The disadvantage lies in lower resistance to temperatures and chemicals.   |  |
|  | 140<br>C-HPU 72<br>Black                 | 70D      | -20                  | 110 | 120        | Static:<br>1000 bar                           |   |  |  |
|  | 151<br>LT-PU Plus<br>Blue                | 96A      | -55                  | 110 | 120        | Dynamic:<br>350 bar                           | Mobile hydraulics<br>Gas fittings<br>Pneumatics   | LT-PU Plus is an advanced development with considerably improved flexibility to cold temperatures  |  |
|  | 170<br>SL-PU<br>Anthracite               | 96A      | -20                  | 110 | 120        | Dynamic:<br>350 bar                           | Pneumatic seals   | This material shows fail-safe characteristics by adding lubricants.  | <b>Resistant to:</b><br>Oily air and disposable lubrication.   |



# Polyurethanes

| Thermoplastic Polyurethanes | Material number Designation Colour | Hardness | Temperature range °C |     |            | Pressure resistance bar (RT)        | Main application   | Description   | Resistance   |
|-----------------------------|------------------------------------|----------|----------------------|-----|------------|-------------------------------------|--|---|--|
|                             |                                    |          | -                    | +   | Short-term |                                     |  |   |  |
| PU (AU) Polyurethane        | 180 PU 93 Green                    | 93A      | -30                  | 110 | 120        | Dynamic: 500 bar<br>Static: 750 bar | O-rings<br>Flat seals<br>Funnels<br>Grooved rings<br>Wipers<br><br>Mobile hydraulics | These PUR types are based on polyester diols. They are particularly suitable in hydraulic systems, and the LT-PU types are well suited for mobile hydraulic systems in cold climatic zones. | <b>Resistant to:</b><br>Mineral oils and greases<br>Several hydraulic media<br>Cold water<br><br><b>Not resistant to:</b><br>Hot water<br>Aromatic solvents<br>Concentrated alcohols<br>Concentrated acids and bases |
|                             | 150 LT-PU Blue                     | 94A      | -50                  | 110 | 120        |                                     |  |   |  |

# Rubber elastomers

| Elastomer as the basis         | Material number Designation Colour | Hardness        | Temperature range °C |     |            | Pressure resistance bar (RT)        | Main application  | Description   | Resistance  |
|--------------------------------|------------------------------------|-----------------|----------------------|-----|------------|-------------------------------------|---|---|---|
|                                |                                    |                 | -                    | +   | Short-term |                                     |   |   |   |
| Nitrile-Butadiene-Rubber (NBR) | 300 NBR Black                      | 85A             | -30                  | 110 | 120        | Dynamic: 250 bar<br>Static: 500 bar | O-rings<br>Static seals<br>Grooved rings<br>Wipers<br>Shaft rings | NBR has good mechanical characteristics and better abrasion resistance compared to other elastomers. NBR is not resistant to weathering and the influence of ozone. NBR can be manufactured with an acryl-nitrile content of 18% to 50%. With reduced ACN content the resistance to oil decreases but simultaneously, the flexibility to cold improves<br><br>NBR 307 is characterized through its excellent machinability at low hardness. Because of its low DVR and durability it is best suitable for wipers and groove rings in low pressure applications as e.g. in pneumatic cylinders.<br><br>For uses at low temperatures. | <b>Resistant to:</b><br>Aliphatic hydrocarbons (propane, butane and petrol, mineral oils and greases, diesel fuel, heating oil)<br>Vegetable and animal fats and oils<br>HFA, HFB and HFC fluids<br>Many diluted acids, bases and salt solutions at low temperature<br>Water<br><br><b>Not resistant to:</b><br>Fuels with high aromatic content (premium-grade fuels)<br>Aromatic hydrocarbons (benzene)<br>Chlorinated hydrocarbons (trichloro-ethylene)<br>Polar solvents (ketones, acetones, acetic acid ethylene esters)<br>Concentrated acids<br>Glycol-based brake fluid<br>Ozone, weathering and ageing |
|                                | 301 NBR White                      | 85A             | -30                  | 110 | 120        |                                     |   |   |   |
|                                | 307 NBR Black                      | 75A             | -30                  | 90  | 100        | Dynamic: 100 bar<br>Static: 250 bar | O-rings<br>Static seals<br>Pneumatics                             |   |   |
|                                | 320 T-NBR Black                    | 80A             | -50                  | 100 | 120        |                                     |   |   |   |
|                                | Highly saturated NBR (H-NBR)       | 310 H-NBR Green | 85A                  | -20 | 150        | 170                                 | Dynamic: 250 bar<br>Static: 500 bar                               |   |   |
| 311 H-NBR Black                | 90A                                | -20             | 150                  | 170 |            |                                     |   |   |   |
| 312 H-NBR ED Black             | 85A                                | -15             | 150                  | 170 |            |                                     |   |   |   |

# Rubber elastomers

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|----------------------------------|------------------------------------|-----------------|----------------------|-----|------------|-------------------------------------|--|--|--|
|                                  |                                    |                 | -                    | +   | Short-term |                                     |  |  |  |
| Ethylene-Propylene Rubber (EPDM) | 330 EPDM Black                     | 85A             | -45                  | 130 | 180        | Dynamic: 150 bar<br>Static: 300 bar | O-rings<br>Flat seals<br>Funnels<br>Grooved rings<br>Wipers  | EPDM has outstanding resistance to ageing and the impact of weathering, and against ozone, light and UV. EPDM is particularly good for use in steam and suds.<br><br>EPDM is often used in the foodstuffs and drinking water segments. There are special approvals for this purpose in accordance with FDA, KTW and W270   | <b>Resistant to:</b><br>Hot water and hot steam up to 150°C with special types up to 180°C<br>Glycol-based brake fluids (cross-linked peroxide types)<br>Many organic and inorganic acids<br>Detergents, baking soda and caustic potash solutions<br>Hydraulic fluids based on phosphate acid esters (HFD-R)<br>Silicone oils and greases<br>Many polar solvents (ketones, esters and alcohols)<br>Resistant to ozone, weathering and ageing.<br><br><b>Not resistant to:</b><br>Mineral oils and greases as well as fuels   |
|                                  | 332 EPDM White                     | 85A             | -45                  | 130 | 180        |                                     |  |  |  |
|                                  | 333 EPDM FDA Black                 | 85A             | -45                  | 90  | 150        | Dynamic: 150 bar<br>Static: 300 bar | O-rings<br>Flat seals<br>Translational and rotational wipers   |  |  |
|                                  | 335 EPDM FDA & KTW Black           | 82A             | -40                  | 120 | 180        |                                     |  |  |  |
| Fluorinated rubber FPM           | 350 FPM Brown                      | 82A             | -20                  | 220 | 300        | Dynamic: 150 bar<br>Static: 300 bar | O-rings<br>Wipers<br>Grooved rings<br>Shaft seals<br>Piston seals  | FPM has the maximum resistance to temperature amongst the prevalent sealing elastomers. In addition, it is highly resistant to oil and fuels. In practice, the terms FPM, FKM and Viton® very often lead to confusion and incorrect interpretations. All these designations represent one basic material – „Fluorinated rubber“. FPM - DIN-ISO standard<br>FKM - ASTM standard<br>FPM is available with varying fluorine content. The higher the fluorine content – the better is the chemical resistance. | <b>Resistant to:</b><br>Mineral oils and greases<br>HFD fluids<br>Silicone oils and silicone greases<br>Vegetable and animal oils and fats<br>Aliphatic hydrocarbons (petrol, butane, propane and natural gas)<br>Aromatic hydrocarbons (benzene, toluene)<br>Chlorinated hydrocarbons (trichloro-ethylene, carbon tetrachloride)<br>Fuels and those containing methanol<br>Resistant to ozone and weathering<br><br><b>Not resistant to:</b><br>Polar solvents (acetone, methylethylketone, ethyl acetate, diethylether, dioxane)<br>Skydrol 500 and 7000<br>Glycol-based brake fluids<br>Ammonia gas, amines and alkalis<br>Steam<br>Low molecular weight acids (formic acid and acetic acid)<br>Methanol above about 40°C |
|                                  | 351 FPM FDA Brown                  | 85A             | -20                  | 220 | 250        |                                     |  |  |  |
|                                  | 352 FPM Black                      | 85A             | -20                  | 210 | 250        | Dynamic: 150 bar<br>Static: 300 bar | Tetrafluoroethylene/propylene is a fluoroelastomer with good resistance to chemicals. One great advantage compared to FPM types lies in the resistance to water and steam. |  |  |
|                                  | 353 FPM ED Black                   | 85A             | -20                  | 220 | 300        |                                     |  |  |  |
|                                  | TFE/P AFLAS®                       | 360 TFE/P Black | 85A                  | -5  | 200        | 230                                 | Dynamic: 180 bar<br>Static: 300 bar  |  |  |
| 361 TFE/P 90A Black              | 90A                                | -5              | 200                  | 230 |            |                                     |  |  |  |

## Rubber elastomers

| Elastomer as the basis  | Material number<br>Designation<br>Colour | Hardness | Temperature range °C |              |            | Pressure resistance bar (RT) | Main application | Description | Resistance |
|-------------------------|--|----------|----------------------|--------------|------------|------------------------------|------------------|-------------|------------|
|                         |  |          | -                    | +            | Short-term |                              |                  |             |            |
|                         |  |          | Silicone MVQ         | 340 MVQ Blue | 85A        |                              |                  |             |            |
| 341 MVQ FDA Transparent | 85A                                      |          |                      |              |            |                              |                  |             |            |
| 342 MVQ FDA White       | 85A                                      |          |                      |              |            |                              |                  |             |            |

## Plastics

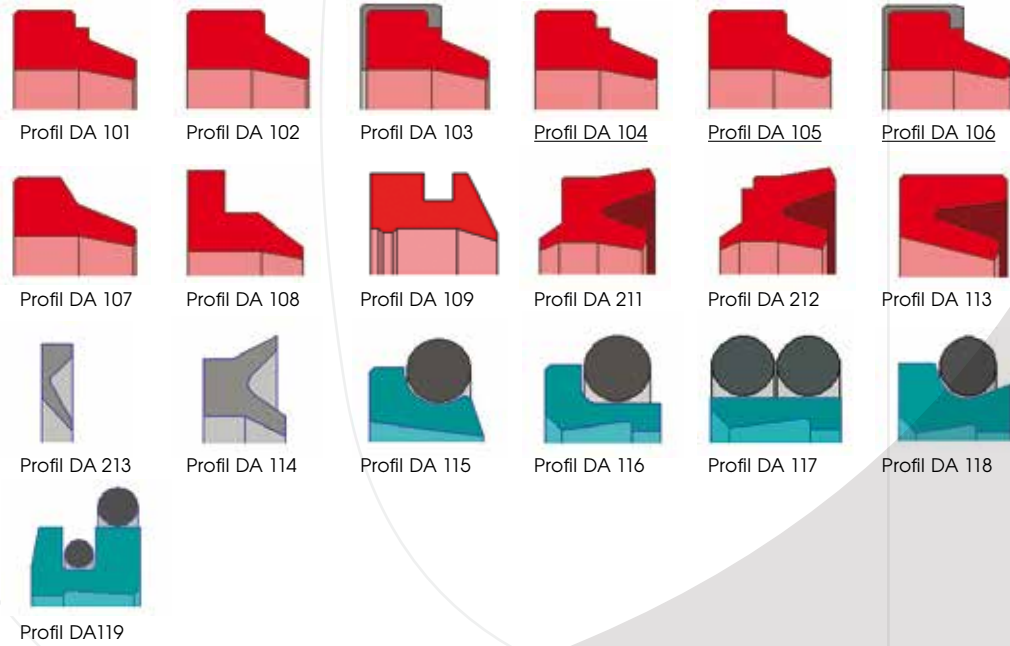
| Material                              | Designation / Colour | Hardness | Temperature range °C |                       |            | Pressure resistance bar (RT) | Main application   | Description   | Resistance   |
|---------------------------------------|----------------------|----------|----------------------|-----------------------|------------|------------------------------|--|---|--|
|                                       |                      |          | -                    | +                     | Short-term |                              |  |   |  |
|                                       |                      |          | Technical plastics   | 400 POM Natural white | 85D        |                              |  |   |  |
| 410 PA 6G Natural white               | 85D                  | -40      | 110                  | -                     |            |                              |  |   |  |
| 420 UHMW-PE                           | 61D                  | -200     | 80                   | -                     |            |                              |  |   |  |
| Technically high-performance plastics | 430 PEEK Beige       | -        | -40                  | 260                   | 300        | Dynamic: 500 bar up to 140°C | Backup rings<br>Special parts<br>Hot water meters<br>Pump impellers<br>Slide bearing | Considering its extraordinary mechanical, thermal and chemical properties, PEEK is used primarily in aeronautical and space travel applications as well as under extreme conditions in the offshore segment. PEEK is also suitable for the use in hot water segments. | <b>Resistant to:</b><br>Almost all organic and inorganic chemicals. Resistant to hydrolysis up to 280°C. Resistant to high-power radiation, especially the glass fibre reinforced types<br><br><b>Not resistant to:</b><br>concentrated nitric acid, certain halogenated hydrocarbons not UV-resistant and carbon-filled types are better suitable |
| Polytetrafluoroethylene (PTFE)        | 600 PTFE pure White  | 55D      |                      |                       |            |                              |  |   |  |

## Plastics

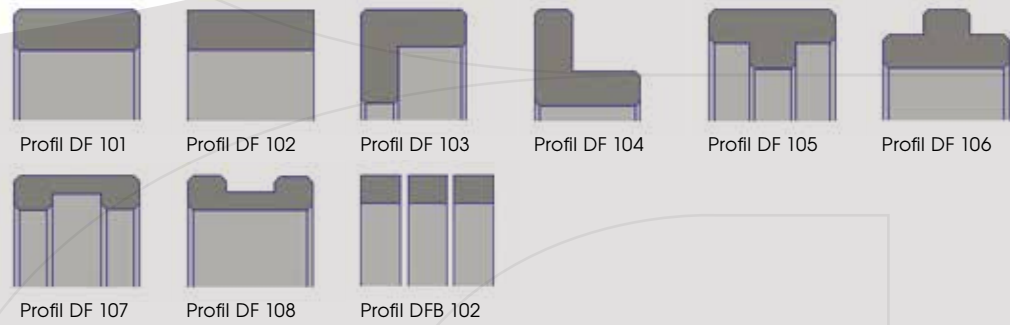
| Material                     | Designation / Colour | Hardness | Temperature range °C                             |  |   | Pressure resistance bar (RT) | Main application | Description | Resistance |  |  |  |
|------------------------------|----------------------|----------|--|--|---|------------------------------|------------------|-------------|------------|--|--|--|
|                              |                      |          | -  | +  | Short-term  |                              |                  |             |            |  |  |  |
|                              |                      |          | Polytetrafluoroethylene (PTFE)                   | 651 PTFE TFM White   | 57D   |                              |                  |             |            |  |  |  |
| 610 PTFE I Anthracite        | 58D                  | 350 bar  | Slip rings<br>Guide belts<br>WDR                 | Filled with glass 15% and MOS2 5%<br>Improved resistance to pressure and less creep tendency<br>Food dielectric properties |   |                              |                  |             |            |  |  |  |
| 620 PTFE II Brown            | 60D                  | 450 bar  | Guide belts for hydraulic systems<br>Slip rings  | With 40% bronze, it is the most prevalent type. For all hydraulic applications   |   |                              |                  |             |            |  |  |  |
| 601 PTFE D05 Turquoise       | 57D                  | 250 bar  | Spring-backed grooved rings<br>Wipers            | Low permeability to gas than the commonly filled types. Lower cold flow  |   |                              |                  |             |            |  |  |  |
| 611 PTFE D05 Glass Turquoise | 60D                  | 300 bar  | Backup rings                                     | Guide belts and wipers for harsher conditions  |   |                              |                  |             |            |  |  |  |
| 612 PTFE D08 Orange          | 62D                  | 350 bar  | Guide belts for hydraulic systems<br>Slip rings  | Best creep strength<br>high wear resistance and less creep tendency  |   |                              |                  |             |            |  |  |  |
| 621 PTFE D46 Grey turquoise  | 63D                  | 650 bar  | Slip rings                                       | High level of resistance with the addition of particularly conductive bronze   |   |                              |                  |             |            |  |  |  |
| 640 PTFE Carbon Black        | 67D                  | 650 bar  | Guide rings and slip rings for pneumatic systems | For hard chrome-plated surfaces and hardened surfaces  |   |                              |                  |             |            |  |  |  |
| 641 PTFE E-Carbon Black      | 60D                  | 450 bar  |  | For soft contact surfaces e.g. aluminium, stainless steel, bronze  |   |                              |                  |             |            |  |  |  |
| 630 PTFE Graphite            | 60D                  | 350 bar  | Spring-backed seals                              | <b>Recommended for:</b><br>All hydraulic fluids<br>Used in water-based hydraulic systems and pneumatic systems.            |   |                              |                  |             |            |  |  |  |
| 650 PTFE Econol Cream        | 56D                  |          |  |  |   |                              |                  |             |            |  |  |  |
| 613 PTFE Glass White grey    | 60D                  | 400 bar  |  |  | Good dielectric properties  |                              |                  |             |            |  |  |  |
| 654 PTFE PEEK Cream          | 60D                  | 650 bar  | For extreme applications                         |  | Good chemical resistance<br>High creep strength<br>High wear resistance |                              |                  |             |            |  |  |  |
| 602 PTFE Conductive Black    | 57D                  | 350 bar  | Against anti-static charge                       | By adding conductive pigments, it is electrically conductive.  |   |                              |                  |             |            |  |  |  |



## WIPERS



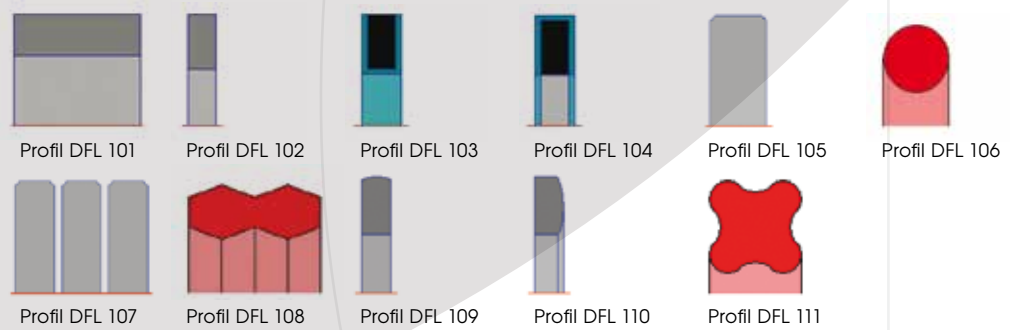
## GUIDE RINGS



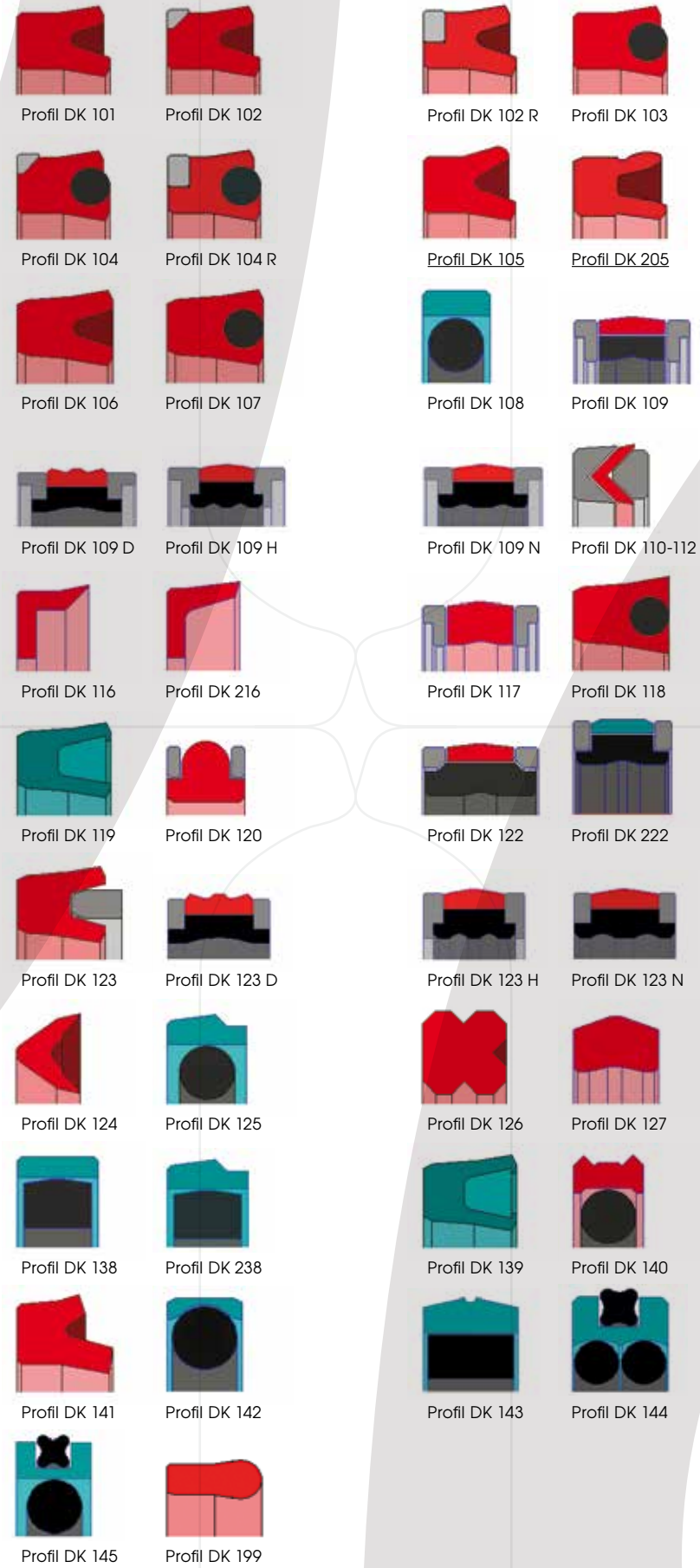
## BACKRINGS



## GASKETS



## PISTON SEALS

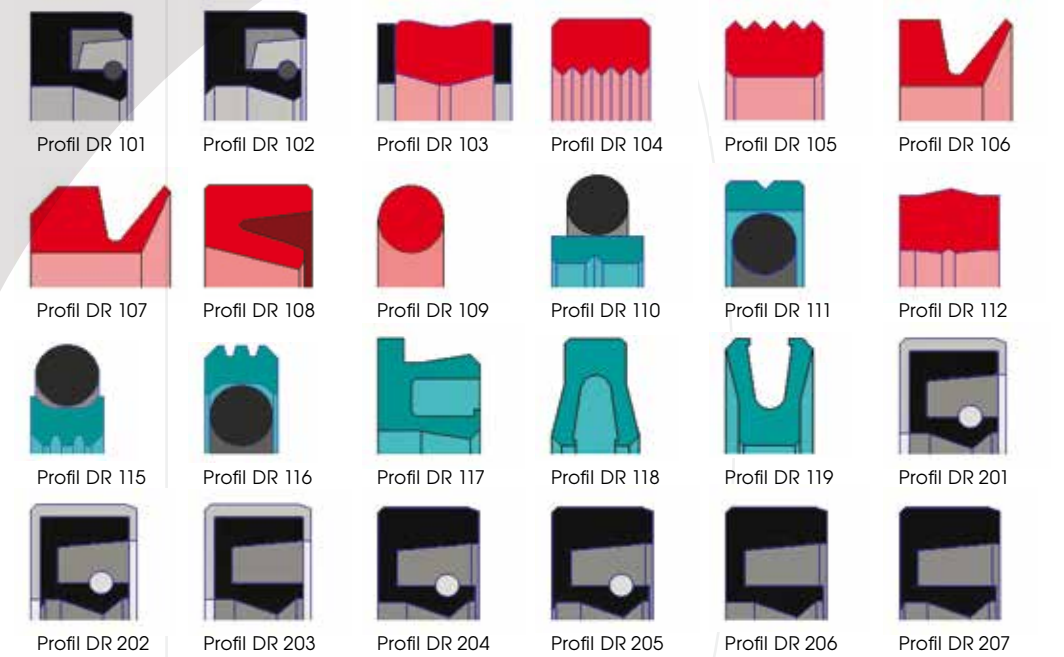


## ROD SEALS



≡ PNEUMATIC

## ROTARY SEALS



# DMH

SOLUTION FOR SEALS

[www.dmh.at](http://www.dmh.at)

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