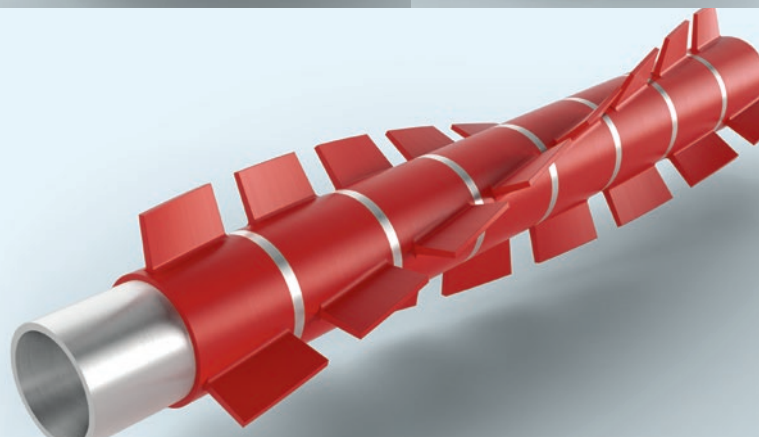
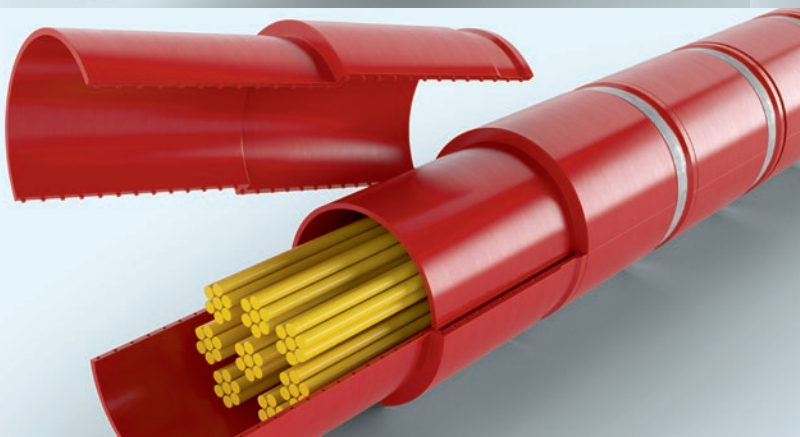
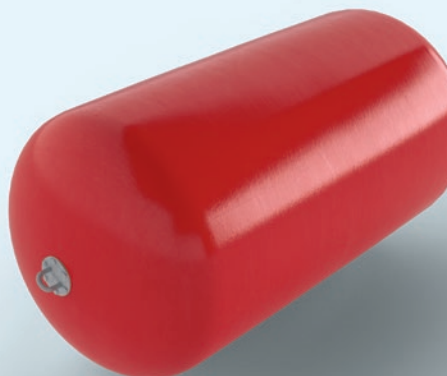
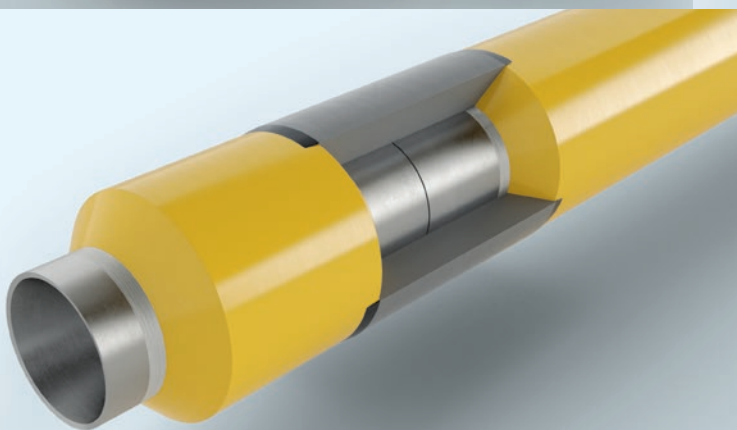
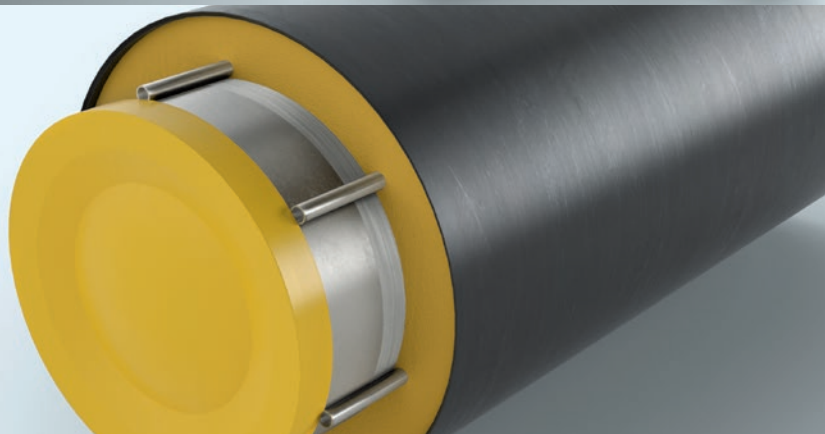
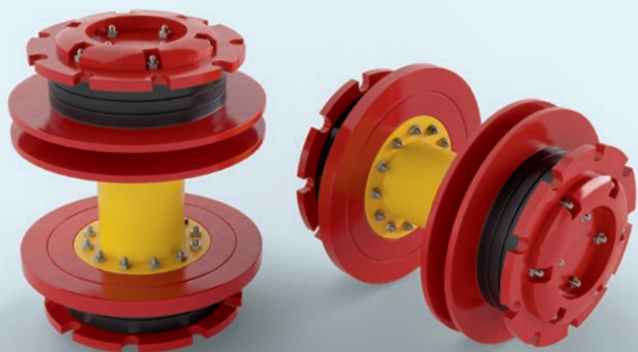


Perfect Match: PU Solutions for On- and Offshore Challenges



Constructing Tomorrow

BASF materials, improving applications
in the oil and gas industry

 **BASF**
We create chemistry



Brage offshore platform in Norway

Maximum performance on- and offshore requires thinking big right down to the smallest detail – that is our speciality! Product features and techniques for on- and offshore and subsea applications could not be more sophisticated. Resulting from decades of experience, BASF knows the oil and gas industry's key factors for success – and offers state-of-the-art solutions for all systems and challenges.

Learn from the following pages how BASF materials can enhance the performance of key applications for the oil and gas industry.

Overview of applications

1. Field Joint
Rigid foam (open-cell) and solid systems for safe welding seams
2. Bend Restrictor
Pipeline bend under perfect control
3. Bend Stiffener
Easy to process even for largest parts
4. Cable Protection
Abrasion and impact resistant
5. VIV Strakes
High stinger loads achieved
6. Pig – Foam
Customised for all pipelines
7. Pig – Discs
Wide range of hardnesses available
8. Line Coat
Pipeline insulation for flow assurance
9. Pipe in Pipe
Rigid insulation foam (closed cell) for on- and offshore applications
10. Anode Infill
Gap filler
11. Spray Coating
Protective spray system for buoys and fenders



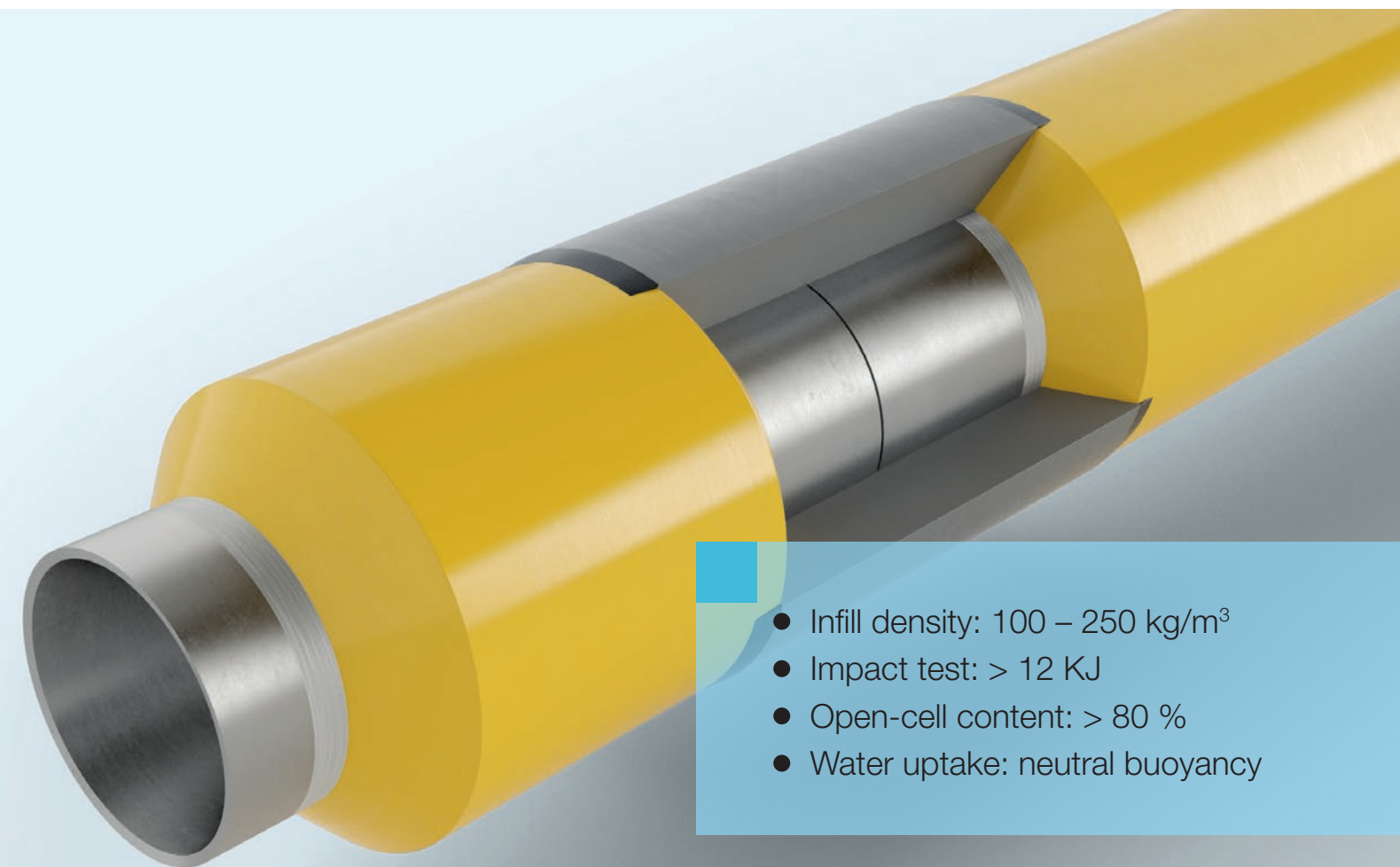
Photo: Klaus Andrews

Field Joint

Rigid foam (open-cell) and solid systems for safe welding seams

Especially in the field of concrete weight-coated gas lines, BASF's Elastopor® H has proven its qualities as an effective gap filler for stabilising and protecting welding seams. The open-cell foam is highly water-absorbing and withstands the strongest forces. The infill density is adjustable to your specific requirements. Features like these have made BASF one of the market leaders in this area.

A range of solid field joint systems is also available.



- Infill density: 100 – 250 kg/m³
- Impact test: > 12 KJ
- Open-cell content: > 80 %
- Water uptake: neutral buoyancy

2.

Bend Restrictor

Pipeline bend under perfect control

Shaped like a spinal column, the bend restrictor protects the pipeline against overloading and buckling. It allows the pipeline to flex – but not too much: This product made from Elastoshore® PU elastomer offers optimum bendability. Thanks to the high Young's modulus, the pipeline stays exactly in the right position, regardless of the flow of the material inside.



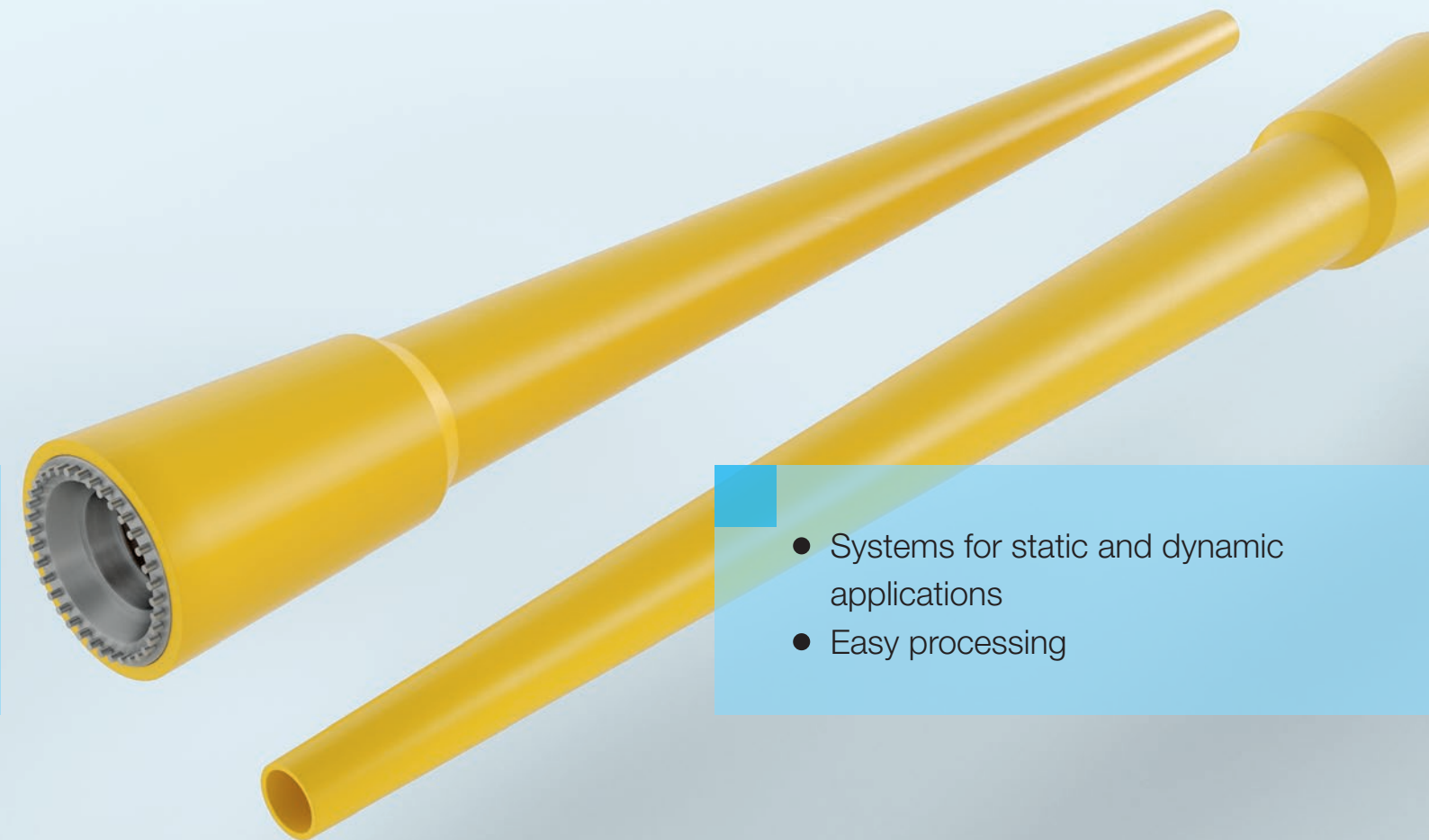
- Easy processing
- Excellent physical properties
- High Young's modulus

3.

Bend Stiffener

Easy to process even for largest parts

The bend stiffeners take the tensile and bending forces that act on the pipeline and protect it through delimitation of the bending radii. BASF's Elastoshore® material is suitable for both static and dynamic systems. Straight and stiff or able to move dynamically: you have the choice – depending on the area of application required.



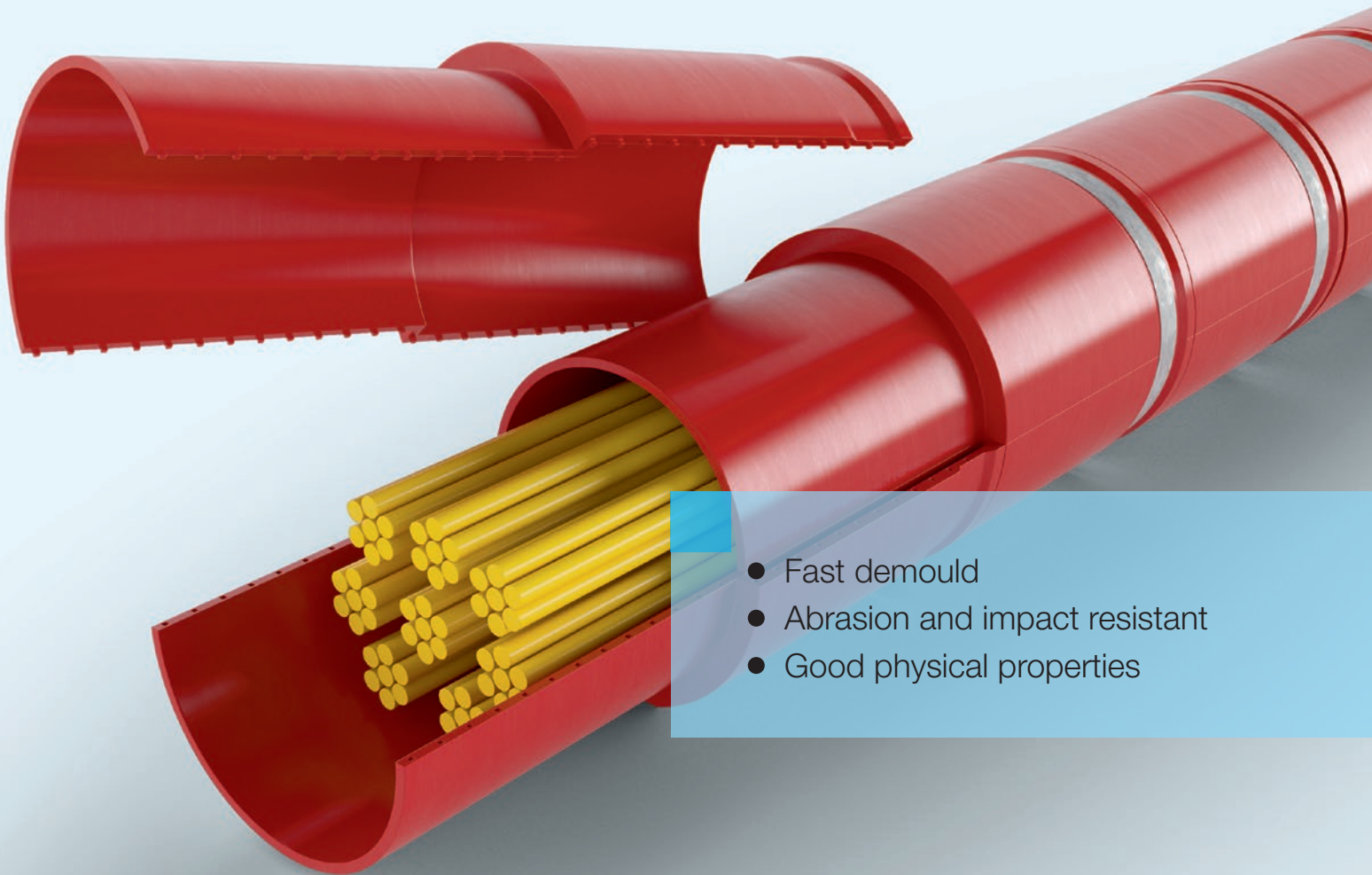
- Systems for static and dynamic applications
- Easy processing

4.

Cable Protection

Abrasion and impact resistant

Sand, rocks, coral reefs, trawler boats – subsea cables are exposed to lots of obstacles and potential risks. In order to protect them effectively against damage, this system made from cast elastomer from our Elastoshore® range is the technique of choice. The cable protection provides rapid demould and can be processed easily.



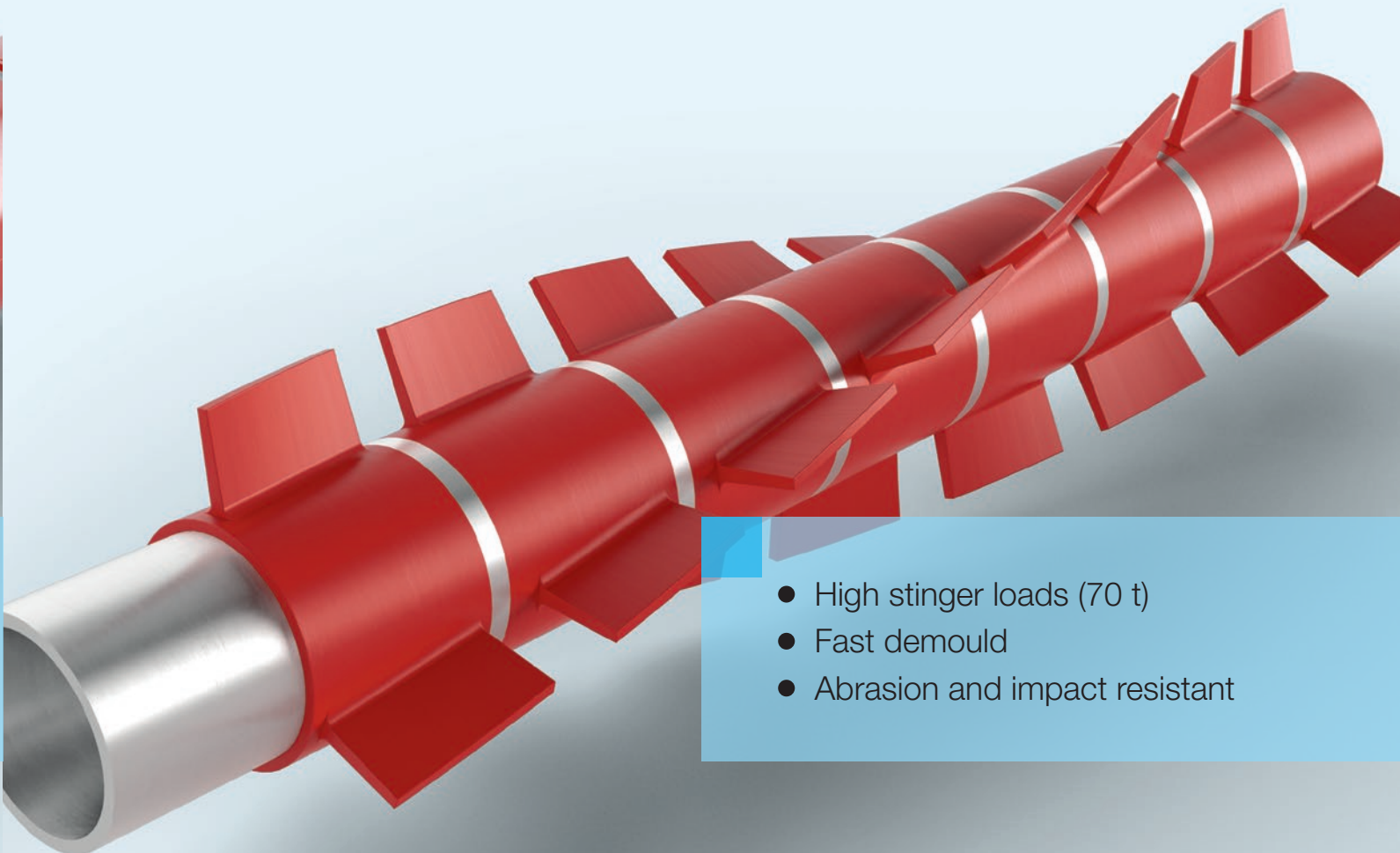
- Fast demould
- Abrasion and impact resistant
- Good physical properties

5.

VIV Strakes

High stinger loads achieved

The helix-shaped elastomer-moulded fins vertically drain off high horizontal water flow velocities and prevent the pipeline from vibrating. As the pipeline is subject to extremely strong forces on its way from the stinger to the bottom of the sea, you need strakes with outstanding properties: Stinger loads of 70 tonnes are easily achieved.



- High stinger loads (70 t)
- Fast demould
- Abrasion and impact resistant

Pig – Foam

Customised for all pipelines

Pipeline inspection gauges (PIG) with a foam core do a perfect job when it comes to cleaning the pipeline, e.g. to remove construction debris. We offer a wide range of foam hardnesses and densities to provide the right solution for every pipeline type. The special product properties make the pigs highly resilient and ensure good compressive strength.

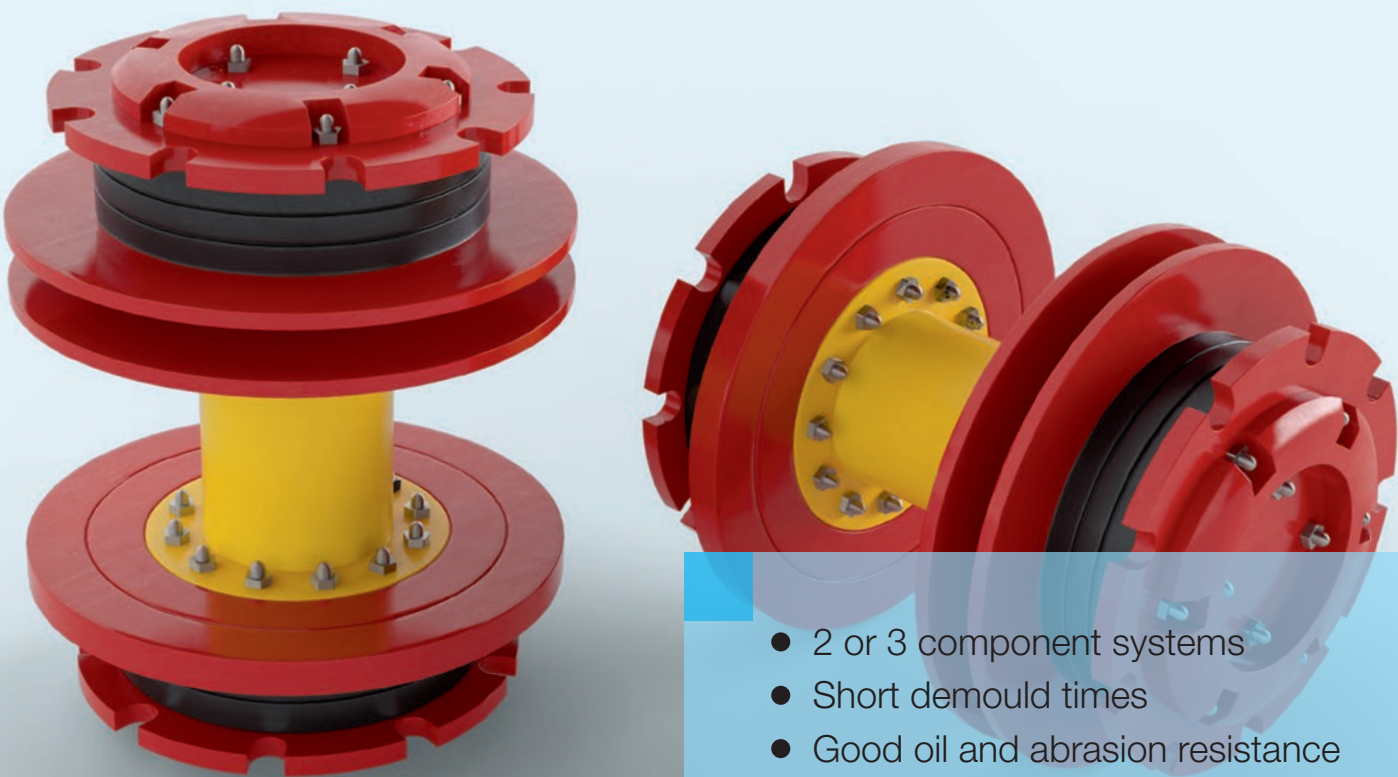


- Range of moulded densities and diametres
- Excellent compressive and tear strength
- Easy processing

Pig – Discs

Wide range of hardnesses available

Are the welds in good condition, is the internal structure of the pipeline intact? Pig systems help to answer these questions and allow maintenance of the pipeline without interrupting the process flow. Travelling sometimes thousands of kilometres through the pipelines, the high oil resistance of our materials Elasturan® and Elastocast® is of major importance. In order to give you maximum application flexibility, we provide the typically polyester-based pig discs as two or three component systems processed by hand or multi component machines, depending on item size and gel time.



- 2 or 3 component systems
- Short demould times
- Good oil and abrasion resistance
- High physical properties

Line Coat

Pipeline insulation for flow assurance

This thermal insulation made from BASF's Elastoshore® material was specially developed for use in deep waters. The excellent thermal properties ensure a constant temperature and therefore continuous flow of the oil inside the pipeline even over long distances. As a result, the amount of chemicals injected into the oil can be reduced significantly – a real cost saver.



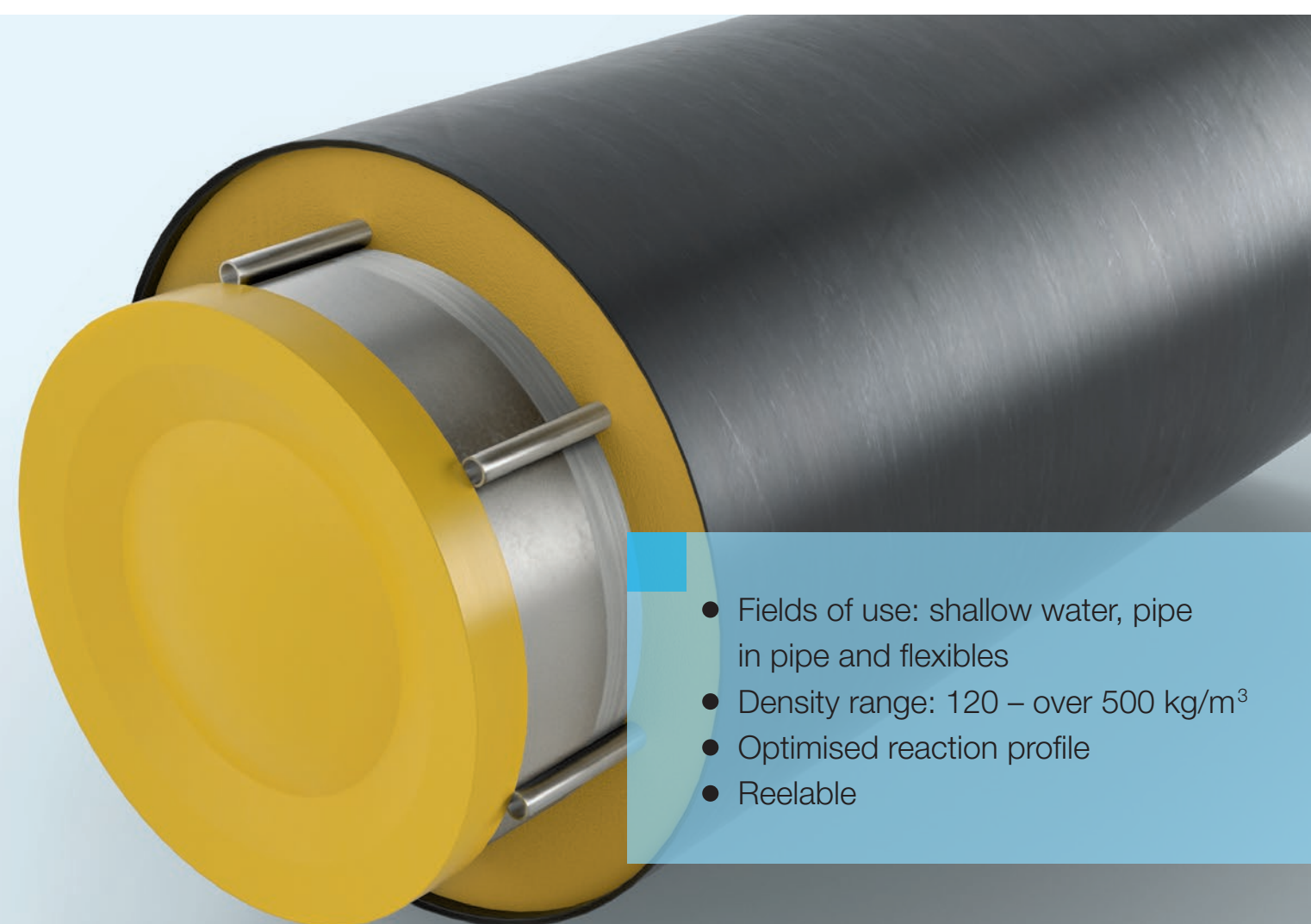
- Good thermal properties
- Reduced wax/hydrate formation
- Reduced injection of chemicals and maintenance costs

Pipe in Pipe

Rigid insulation foam (closed cell) for on- and offshore applications

BASF is one of the few companies on the market that can produce this rigid foam to fill up the space between two pipes for both stiff and flexible pipelines. Regarding density and reaction profile, the material can be tailored exactly to customer or project requirements.

This foam can even be rolled up and supplied in reel form on site – a unique feature offered only by BASF.

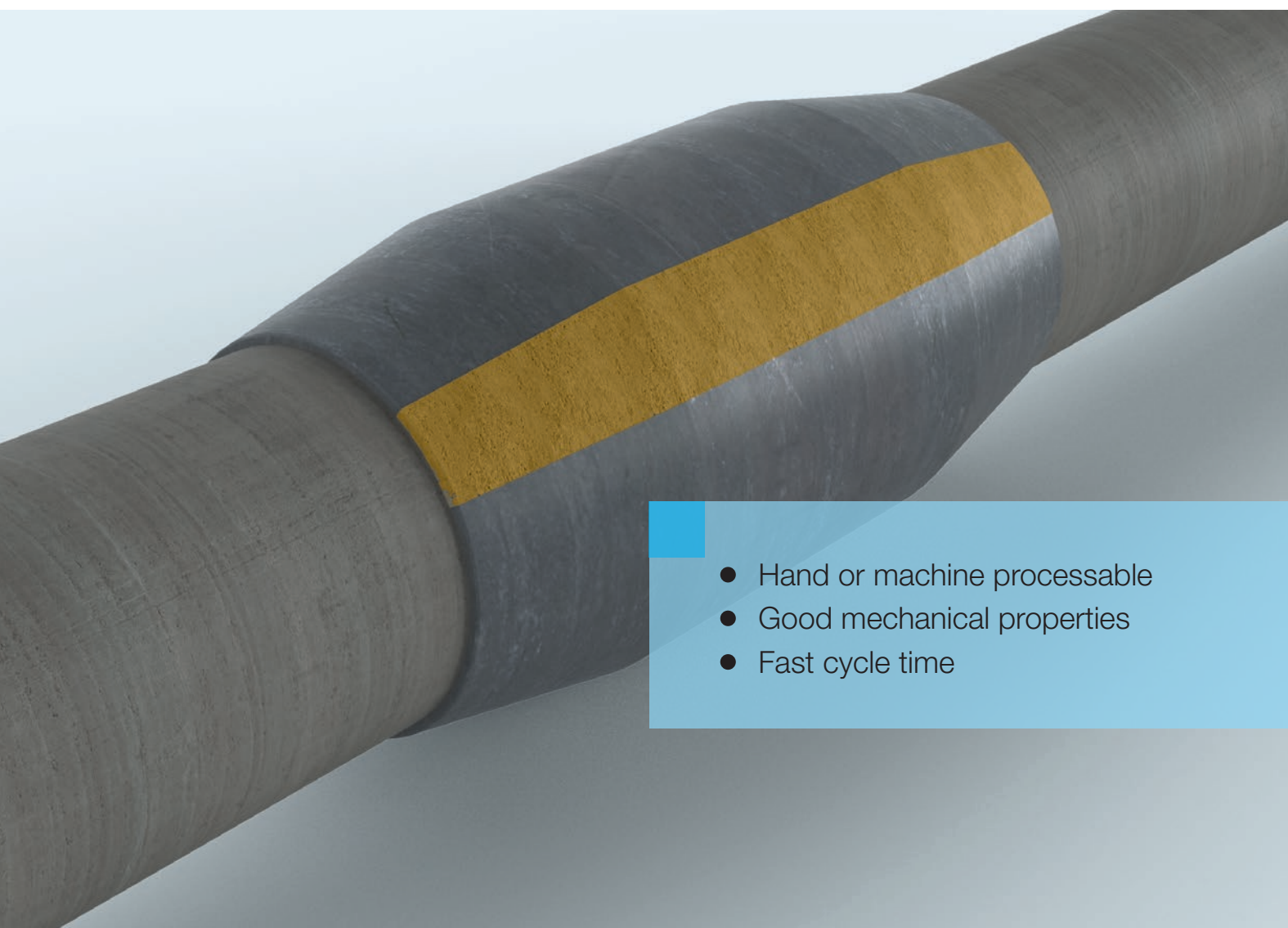


- Fields of use: shallow water, pipe in pipe and flexibles
- Density range: 120 – over 500 kg/m³
- Optimised reaction profile
- Reelable

Anode Infill

Gap filler

This material is used to fill the gap between the metal pipe and anode. The fast-curing polyurethane from BASF's Elastoshore® range reliably keeps the sacrificial anode intact. We can provide two processing techniques: by machine or by hand. So the anode infill can be used even in places where there is no machinery available.



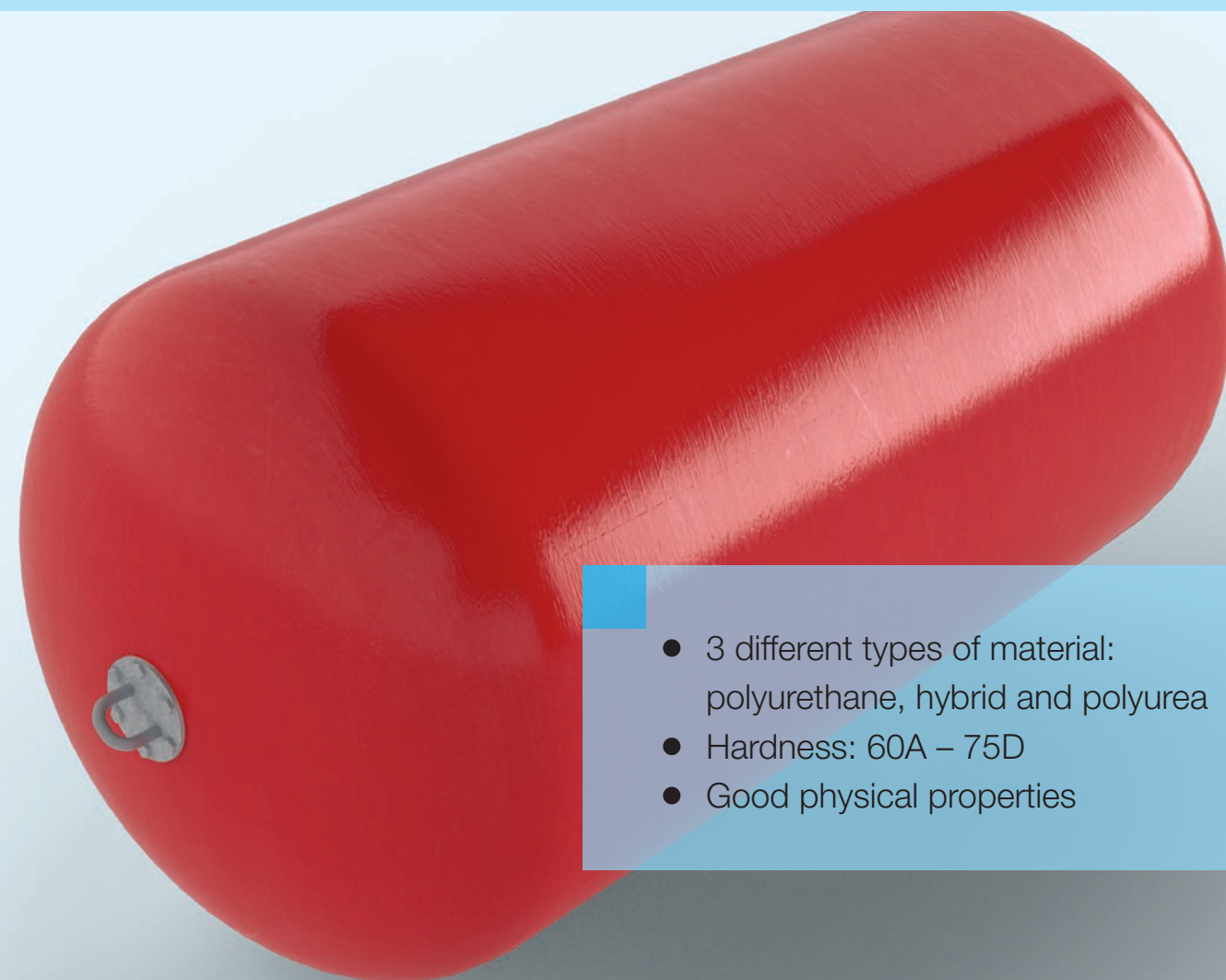
- Hand or machine processable
- Good mechanical properties
- Fast cycle time

Spray Coating

Protective spray system for buoys and fenders

The spray coating based on elastomer from our product ranges Elastoshore®, Elasturan® and Elastocast® has been developed in a flexible manner to give you various application options. The wide hardness range allows consistencies from rubbery to very firm.

We offer the spray coating in three different versions: polyurethane, hybrid and polyurea.



- 3 different types of material: polyurethane, hybrid and polyurea
- Hardness: 60A – 75D
- Good physical properties



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