

**DANSK
GUMMI INDUSTRI**

THINKING SOLUTIONS

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DANSK GUMMI INDUSTRI A/S
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BE INSPIRED!

Join us in crafting the transport and handling equipment of tomorrow's wind industry

DANSK GUMMI INDUSTRI A/S

THINKING SOLUTIONS

OUR PURPOSE

We are passionate about creating value through the continued development and application of the infinite possibilities that the elastomer universe represents.

We are a 105-year-old company that has managed to develop continuously through four generations. And we are proud that we have succeeded in developing increasingly complex and value-creating competencies. For the benefit of society, our customers and partners, and for ourselves.

Together with our many customers and partners, we create new industrial solutions to the many challenges facing the world. And we contribute, as far as possible, to transforming the industrial production of the Western world in a sustainable direction. We do this, among other things, by insisting on innovating and developing new ways of applying elastomers, so that the material's great potential for use is increasingly utilized. And we do this by always focusing on how we can produce our results and meet our needs while considering that it does not happen at the expense of future generations needs.

DEAR INNOVATION PARTNER

At **Dansk Gummi Industri A/S** we have been delivering rubber and polyurethane solutions to the wind industry for more than 15 years. We strive to be a genuine value adding partner for our customers and partners. This through co-creation of best-in-class solutions for the industry.

Throughout the years our ingenuity, craftsmanship and dedication has resulted in several multi-brand solutions for the wind industry. Solutions that serve generic demands for safe and flexible handling and transportation, and yet at the same time serve very specific needs for individual customers.

As an example, our ongoing dialogue with industry partners has played a prominent role in understanding the importance and specific requirements of edge protection during transport and handling of wind turbine blades. The process prompted us to look broadly at the current solutions in the market.

It is our experience that, in order to develop new innovative solutions or to optimize existing ones, cooperation with various partners in the industry value chain is of great importance.

And in the spirit of collaboration it is our hope that you will become inspired. Inspired to seek new solutions for safe and intelligent handling and transport of wind industry elements. And, inspired to challenge us with your ongoing needs for clever, practical and cost reducing solutions.

In the following pages we will elaborate on the individual multi-brand solutions, their areas of application and respective properties. You will benefit from our thorough test data, innovation skills and solid know-how. And your next project will benefit from it from day one.

So, be inspired! And don't hesitate to contact us with your next challenge.

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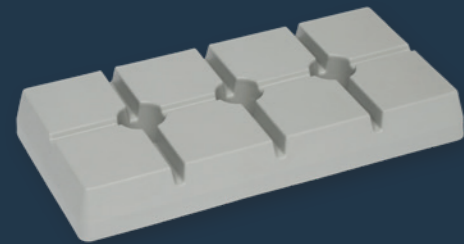


CONTENTS

PRO-PAD® FRICTION 303-40R35™	8
PRO-PAD® LOAD 303-40P82™	10
PRO-PAD® FRICTION 420-20P55™	12
TE-PRO 600 TL™	14
PF100™ & PF150™	16
POLYURETHANE PAD™	18
PRO-PAD® MAINTENANCE KIT™	20
SHORE COLLECTION™	22
KNOWLEDGE SHARING	24
CRAFTING VALUE	26
WE ARE INSPIRED. JOIN US!	28
CONTACT	30

PRO-PAD® FRICTION 303-40R35™

DIMENSION	VALUE
Height:	40 mm
Length:	300 mm
Width:	150 mm
Hole diameter:	Ø29 mm
Hole distance:	75 mm
Weight:	1900 g



The story behind the development of the **PRO-PAD®** products was a tendency in the industry, asking for custom rubber solutions for each clamp design. We acted on a need in the industry for more flexibility and modularity, while benefitting from the value of a standardised product.

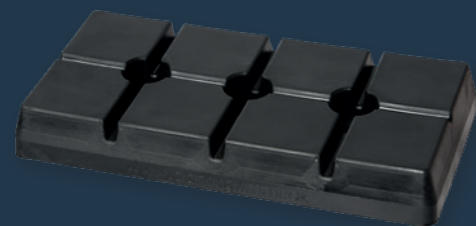
The **PRO-PAD® FRICTION 303-40R35™** is designed for easy and quick installation. The flexibility of the **PRO-PAD®** ensure adaptation to the contour beneath it when installed. The modularity secures fit for every design, makes it easy to install and cost effective to replace on site, rather than bringing the tool to a workshop.

Documentation of material properties and 3D files are ready for the development of new tools. Coefficient of friction, load capacity and lifetime analysis data, are of course available upon request. We constantly are focused on documenting any data that brings value to partners using the **PRO-PAD®**.



PRO-PAD® LOAD 303-40P82™

DIMENSION	VALUE
Height:	40 mm
Length:	300 mm
Width:	150 mm
Hole diameter:	Ø29 mm
Hole distance:	75 mm
Weight:	1900 g



Transport and handling of tower sections, nacelles, turbine hubs and driveshafts has been the driver for developing the **PRO-PAD® LOAD 303-40P82™**.

Based on the research platform and technical/functional insights of the **PRO-PAD® FRICTION™** solution, the **PRO-PAD® LOAD™** was developed.

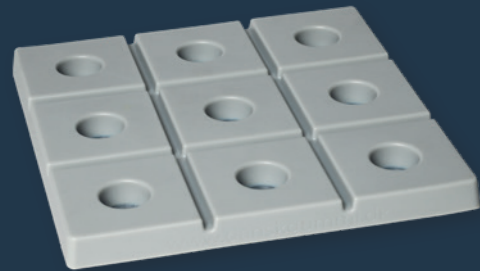
The **PRO-PAD® LOAD 303-40P82™** has the same dimensions as the **PRO-PAD® FRICTION 303-40R35™** but with a higher load capacity.

The **PRO-PAD® LOAD 303-40P82™** products are available in non-permeable black, which ensures stain-free transport of the objects.



PRO-PAD® FRICTION 420-20P55™

DIMENSION	VALUE
Height:	20 mm
Length:	250 mm
Width:	250 mm
Hole diameter:	Ø27 mm
Hole distance:	167 x 167 mm
Weight:	1600 g



We just can't help ourselves. When a customer comes to us with a challenge, we always rush to solve it.

The **PRO-PAD® FRICTION 420-20P55™** was developed to have similar properties as the **PRO-PAD® FRICTION 303-40R35™** but is used when the requirements for height clearance is smaller.

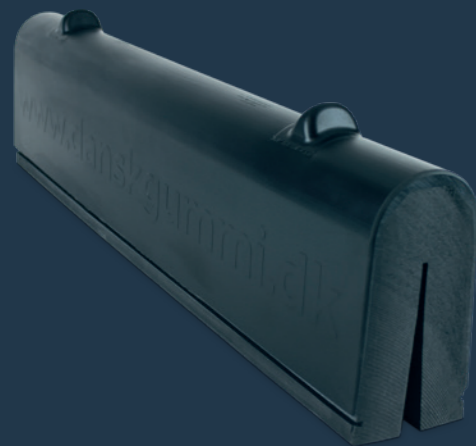
This also provides the solution with the ability to fit smaller concave and convex radii as well as a break in the curve, illustrated on the opposite page.

As a consequence, this solution provides a higher design and application flexibility when constructing transport and handling rigs.



TE-PRO 600 TL™

DIMENSION	VALUE
Height:	265 mm
Length:	950 mm
Width:	128 mm
Thickness:	48 mm
Tagline mount:	Ø12 mm
Weight:	6000 g



We developed the TE-PRO 600 TL™ to deliver the best possible solution for edge protection. A solution that could be handled by a single person and combined high flexibility with high durability.

The unique combination of materials used for our TE-PRO 600 TL™ has resulted in a very lightweight product. The materials do not absorb water and are easy to clean for any foreign objects that might damage the blade when installing the TE-PRO 600 TL™.

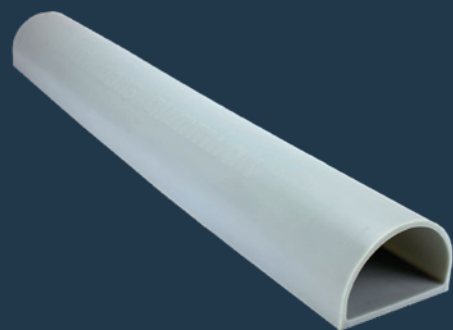
The continuous development has so far resulted in 2 versions of the TE-PRO 600 TL™. One with holes for taglines, and one without holes for taglines. Both are developed to fit any blade size.

The TE-PRO 600 TL™ adapts to the contour of the blade and protects from lashes and bumps, by distributing the pressure over a larger area.



PF100™ & PF150™

DIMENSION	VALUE (100™ / 150™)
Height:	67 mm / 100 mm
Length:	1000 mm
Width:	100 mm / 150 mm
Weight:	2200 g / 3400 g



Our **PUR Fender™** was developed for protecting both the turbine blade as well as the scaffolding equipment during repair operations.

This product is the result of a unique customer demand for a versatile solution, where it was essential that the hardness properties of the **PUR Fender™** could be changed according to the specific usage situation. With our portfolio of material solutions this was achieved.

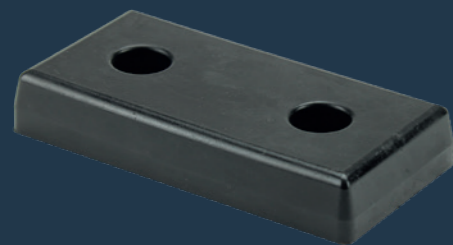
The cushioning effect, which the product provides, can be manipulated by selecting different combinations of geometry and hardness of the material. This gives the **PUR Fender™** the ability to be soft and flexible for the very vulnerable operations as well as tough and firm for high impact. Still with high flexibility.

The versatility of the **PUR Fender 100™** & **PUR Fender 150™** is only virtually unlimited. The solution can be customised to fit any given length requirement. The modularity of the product ensures high adaptability for your specific need.



POLYURETHANE PAD™

DIMENSION	VALUE
Height:	265 mm
Length:	950 mm
Width:	128 mm
Weight:	200 g



The **Polyurethane Pad™** is versatile solution that serves a lot of different purposes. It is small and can easily be installed on a broad range of surfaces.

The **Polyurethane Pad™** is made of polyurethane and the material properties can be customised for your specific need. The geometry of the pad, however, is locked.

Our number of our customers are using this solution to ensure no metal-to-metal or metal-to-object contact on their rigs and constructions.

In the softer editions from 55 SH A - 70 SH A the **Polyurethane Pad™** is very flexible. The harder editions, from 75 SH A - 75 SH D, are chosen for continuous load functionality.

Please challenge us with any specific project you may consider the **Polyurethane Pad™** feasible for.



PRO-PAD® MAINTENANCE KIT™



We know from experience that our products are used in a vast variety of environments around the world. In order to secure optimal friction and clean surfaces, proper care is essential.

By using the **PRO-PAD® Maintenance Kit™**, you ensure the friction properties are upheld and will provide an optimal and clean contact surface.

The maintenance kit contains the **PRO-PAD® Cleaner™** and the **PRO-PAD® De-ICER™**. Both are specifically developed for the **PRO-PAD®** range of products.



We strongly recommend the use of personal protective equipment such as eye protection and gloves when using our maintenance kits. Such personal protective safety measures should never exclude, overrule or replace other health, safety or environmental measures in place.



SHORE COLLECTION™

In order to present the scope of our material portfolio, we have included a representative collection of different elastomer samples that individually represent different shore hardness properties.

It is our hope that the collection will provide you with a tactile feel for the different thicknesses and how the material reacts to deformation.

The collection is comprised of the following samples:

- 55 SH A Clear
- 60 SH A Blue
- 70 SH A Green
- 75 SH A Gray
- 82 SH A Black
- 90 SH A White
- 58 SH D Red
- 75 SH D Yellow

Besides the apparent thickness and hardness, this collection also highlights the tactile finish of the material.



KNOWLEDGE SHARING

Collaborating with **Dansk Gummi Industri A/S** you are guaranteed high quality and thorough documentation. Every solution you purchase from **Dansk Gummi Industri A/S** is documented with all essential data.

Data such as coefficient of friction, ageing, deformation, resistance etc. is made available to our partners depending on their product and individual documentation needs.

This documentation is especially valuable with our full traceability add-on feature. To every product you may wish. This full traceability feature allows you to trace our products in such a way that it meets your individual organizational requirements. **Dansk Gummi Industri A/S** also uses the traceability to evaluate and optimize on production, products and documentation, for continuous improvement of our market offerings.



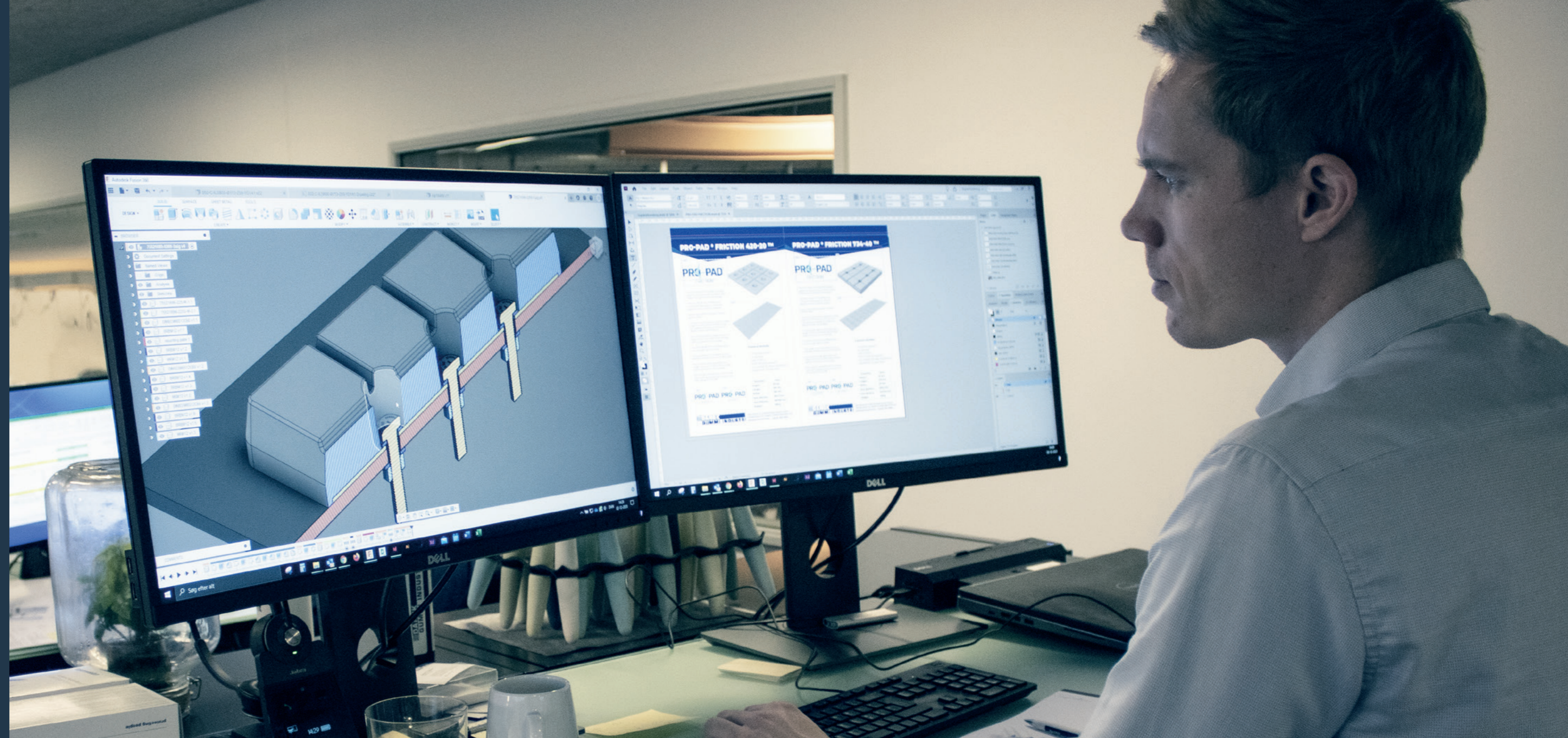
CRAFTING VALUE

Trust is a cornerstone of all collaboration. And confidentiality is essential in the wind industry. Especially when developing prototypes, exchanging proprietary drawings and 3D-files or conducting brainstorming and managing design processes.

Our 15-year track record of cooperation with several large customers in the wind industry, underlines our commitment to strict confidentiality and serves as a prerequisite for the valuable collaboration we have with our wind industry partners.

Ongoing development of new elastomer solutions demands extensive know-how. Either from trial-and-error processes, based on material knowledge and technical production expertise or imaginative design phase processes.

During new solution development and prototyping processes we offer full access to our knowledge base, production capabilities and collective material expertise. We support you as our partner and contribute with design input, drawings and development of prototypes all the way through to full scale production.



WE ARE INSPIRED. JOIN US!

Radical innovation in tomorrow's wind industry will largely be dependent on the ability of various industry collaborators to join forces in challenging existing solutions.

INNOVATION IS PART OF OUR DNA

Dansk Gummi Industri A/S was founded in 1915 and we have continuously managed to innovate and re-think our business through four generations. We are proud that we have succeeded in developing our increasingly complex and diversified capabilities for more than 100 years.

From humble beginnings selling and repairing bicycles in 1915 we moved on to selling, repairing and servicing an entire range of rubber tires for all sorts of vehicles through both world wars and well into the 1950's.

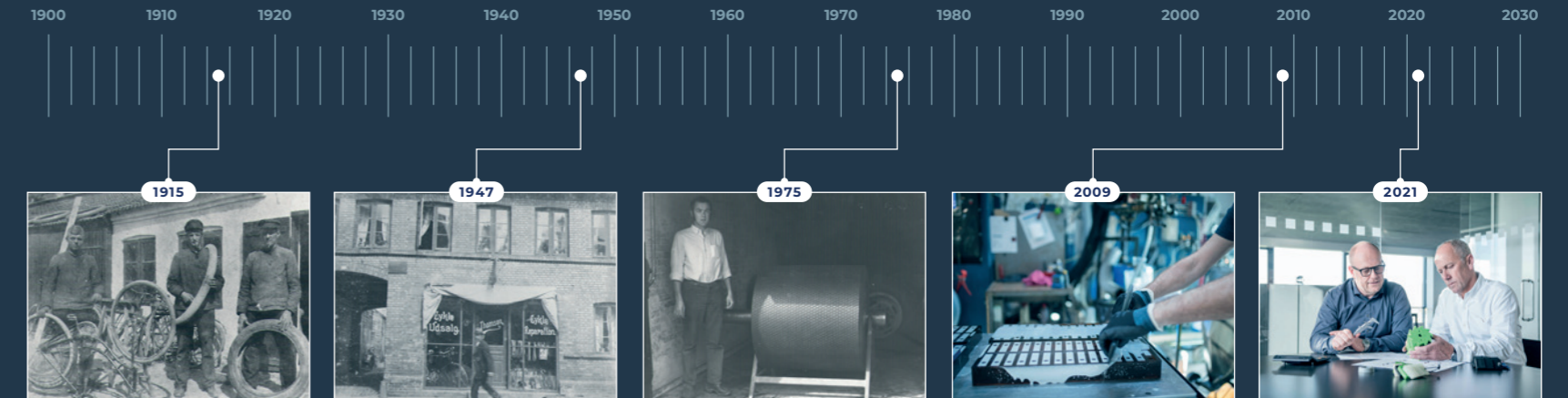
By the early 70's third generation Thomsen – Niels Holger Thomsen – had developed a thriving business manufacturing and renovating rubber rollers and other moving parts for industrial use.

In 2005 our innovative DNA again led us to branch out from the traditional rubber manufacturing business. The use of polyurethane as a versatile material for industrial flexibility, relevant friction and shock absorption was still in its infancy and yet we invested in a brand-new polyurethane facility, just across the road from the rubber manufacturing facility in our hometown of Kolding, Denmark.

With a new technology available we methodically challenged the use and application of traditional rubber material to develop new solutions with new application possibilities using PUR instead of rubber.

TOMORROW'S HYBRIDE SOLUTIONS

Today our innovation efforts are directed towards the unique capability of both merging and interchanging the functionalities of the rubber and polyurethane technologies. We harness our collective inhouse skill base and enable us to further develop the best application solutions in the industry with our partners.



Holger Thomsen founded a small shop in his native town of Kolding (Denmark) selling, repairing and tire patching bicycles. The automobile made its entry during this period and Mr. Thomsen soon followed suit and offered complimentary car tire repair services.

In spite of acute post WW2 shortages of raw materials and supplies Mr. Thomsen continued to exploit his entrepreneurial mindset – now joined by his son Marinus Thomsen. In 1947 father and son expanded into manufacturing molded technical rubber parts for industrial use.

Niels Holger Thomsen (3rd generation) had the factory premises in downtown Kolding expropriated by the city, and the company moved to brand new facilities on the outskirts of town. This also saw an end to the manufacturing of tire tread rubber and renewed focus on the booming industrial market for rubber parts.

By 2009 a brand-new polyurethane facility was established. Just across the road from the rubber manufacturing facility in our hometown of Kolding, Denmark.

Fourth generation Thomsen – Peter (left) and Christian (right) – have leveraged the innovative 20th century rubber manufacturing skills and a customer focused corporate culture and applied it to tomorrow's polyurethane universe.

CONTACT

We hope you will find our elastomer kit inspirational and that it will trigger curiosity about the products we supply for the wind industry. And we would be pleased to craft value with you on your next project or solution development process.


The elastomer inspiration kit is our way to show our dedication to our partners and the ongoing challenges they are facing. And we hope that the kit will serve as a platform for upcoming dialogue and collaboration.


We would be pleased to assist you in your future challenges, so just reach out!

Best regards

The Wind Team

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