

An aerial photograph of a city street, likely in China, showing a wide road with multiple lanes, green spaces with trees, and modern buildings in the background. The image is framed by a white, wavy border on the left and bottom. Three white hexagonal outlines are overlaid on the image: one on the right side, one on the bottom right, and one on the bottom left.

TOGETHER FOR  
FUTURE MOBILITY

# A NEW ERA OF SUSTAINABLE SYNTHETIC RUBBER SOLUTIONS

SYNTHOS SYNTHETIC RUBBER

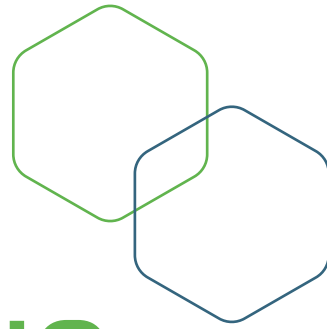
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We believe that by implementing change at Synthos we can create positive change around us.

# SYNTHETIC RUBBER PORTFOLIO

SYNTHETIC RUBBER	TRADEMARKS	APPLICATIONS
<b>Solution styrene butadiene rubber (S-SBR)</b>	<b>SPRINTAN®</b>	Compounds for high performance summer, winter and all season tires, bus and truck tires, and ultra high performing tires, such as EV tires.
<b>Butadiene rubber (BR)</b> high cis BR: neodymium BR (Nd-BR) and nickel BR (Ni-BR), low cis BR: lithium BR (Li-BR)	<b>SYNTECA®</b>	Tread and sidewall tire compounds, technical rubber goods such as conveyor belts and golf balls (Nd-BR and Ni-BR). HIPS and ABS modification, compounds for tires and technical rubber goods (Li-BR).
<b>Emulsion styrene butadiene rubber (E-SBR)</b>	<b>KER® BUNA®</b>	Compounds for tires, technical rubber goods, such as conveyor belts, cables, industrial hoses, and anti-vibration parts for the automotive industry.
<b>Acrylonitrile butadiene rubber (NBR)</b> <b>High styrene rubber (HSR)</b>	<b>KER®</b>	Technical rubber goods requiring good resistance to oils, fuels and greases (NBR). Floor linings, cables, toys, footwear (HSR).





# WE ARE HEADING IN THE GREEN DIRECTION

Synthos is a leading global chemical company with roots in Oświęcim, Poland. We produce synthetic rubber, styrenics, crop protection products and dispersions, latex and adhesives.

At Synthos, we offer value-creating solutions that help change the world. Making it a better, friendlier and safer place to live and work.

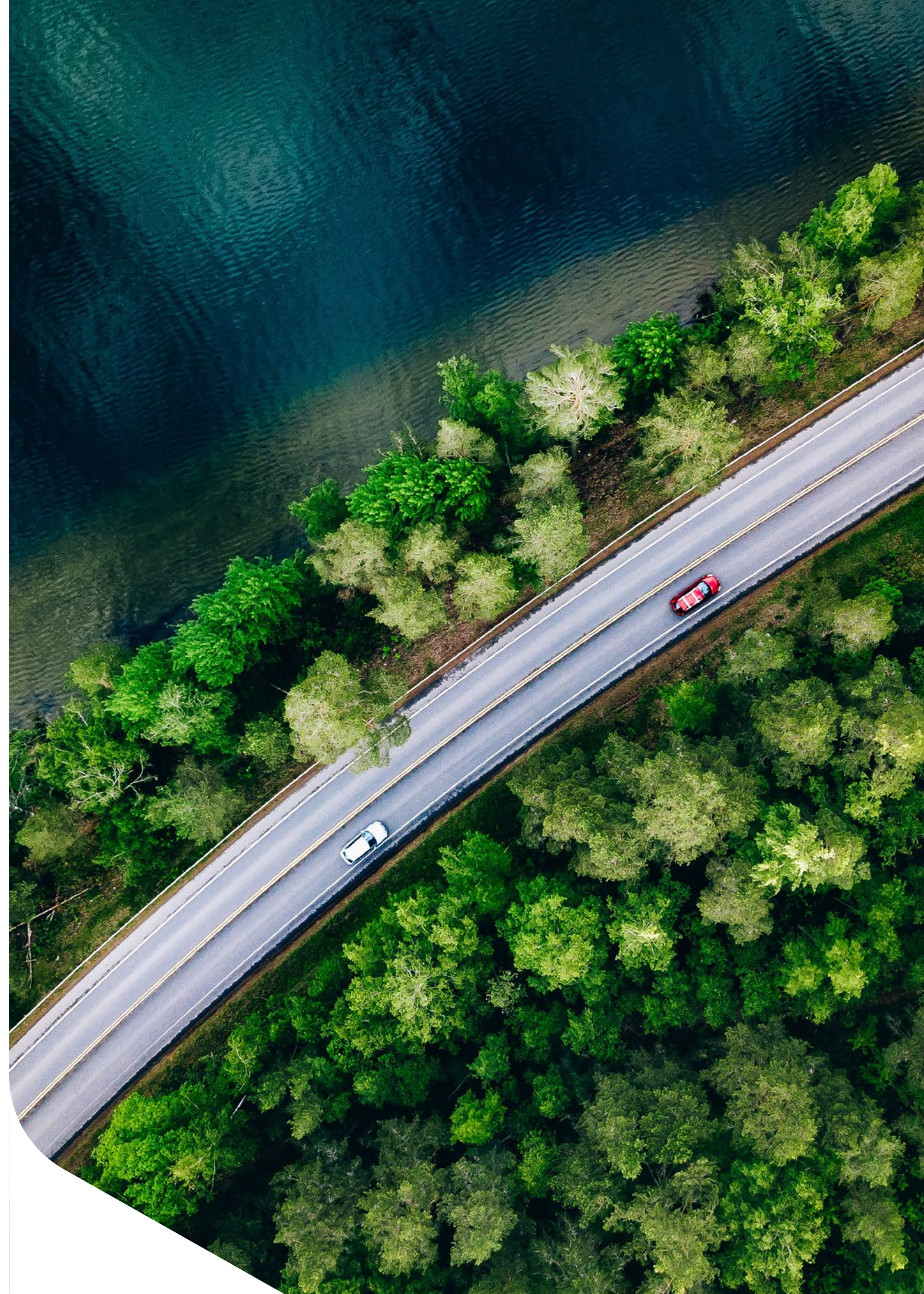
The solutions offered by Synthos are with us every day - thanks to them we can stop negative changes in the world around us.

We started producing synthetic rubber more than 60 years ago and today we are the second largest producer of these essential materials in the world. Over the years, we have also established ourselves as one of the leading European producers of expandable polystyrene and

XPS boards. Our production facilities are located in Poland, the Czech Republic, the Netherlands, Germany and France. Here we manufacture our solutions and then distribute them - even to the most remote parts of the world.

**We employ over 3,600 passionate people whose ambition, commitment and hard work have made Synthos the company it is today.**

We have three modern research and development centers, where we are constantly working on improving the solutions we offer to make them even more user-friendly and, above all, environmentally friendly.







# WE ARE A LEADING GLOBAL SYNTHETIC RUBBER MANUFACTURER

Synthos has decades of experience in the development and production of synthetic rubber solutions for tires and other industrial applications, focused on performance, reliability and sustainability.

Our advanced materials are driving positive change in the global tire industry. Together with our customers, we are continuously rethinking synthetic rubber and enabling applications with a reduced environmental footprint without compromising on performance, safety or efficiency.

Synthos has an annual production capacity of 760,000 MT and offers a broad portfolio of high quality, versatile elastomers including S-SBR (SPRINTAN®), BR (SYNTECA®), E-SBR (KER® and BUNA®), NBR (KER®) and HSR (KER®).

Our state-of-the-art S-SBR pilot plant in Germany supports rapid new product development and fast scaling of new products. At our research and development centers in Schkopau (Germany) and Oświęcim (Poland), a world-class team of chemists, technology and processing experts work to accelerate the improvement of our products and processes.



# WE ARE INVESTING IN A GREEN FUTURE

Our vision is a net-zero future for synthetic rubber and its applications. We are focused on embedding sustainability throughout the value chain. To this end, we are investing in growth, green technologies and building partnerships that harness science to drive circular innovation.

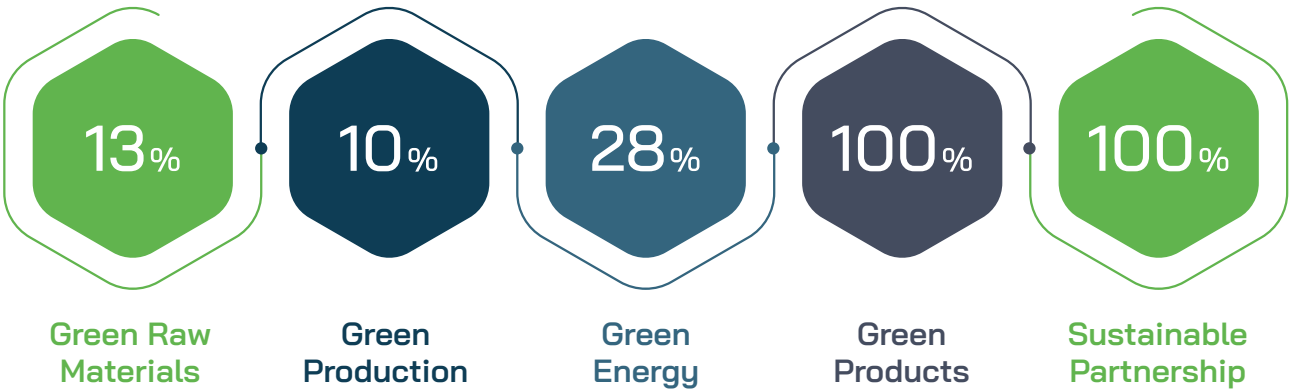
We are increasing our production capacity while investing in low- and zero-carbon energy sources and more efficient production processes. We are investing in alternative bio-based, renewable and recycled raw materials. We invest in

R&D aligned to our sustainability goals so that we can offer our customers the most advanced product portfolio in the synthetic rubber industry that meets their ambitious environmental goals.

We also invest in people – our Synthos family and the next generation of polymer technologists, as we work with universities around the world to develop new and innovative material solutions for tomorrow’s world.

**Together we can achieve more.**

## Our 2030 Sustainability Commitments



Carbon-free energy in Synthos by 2028

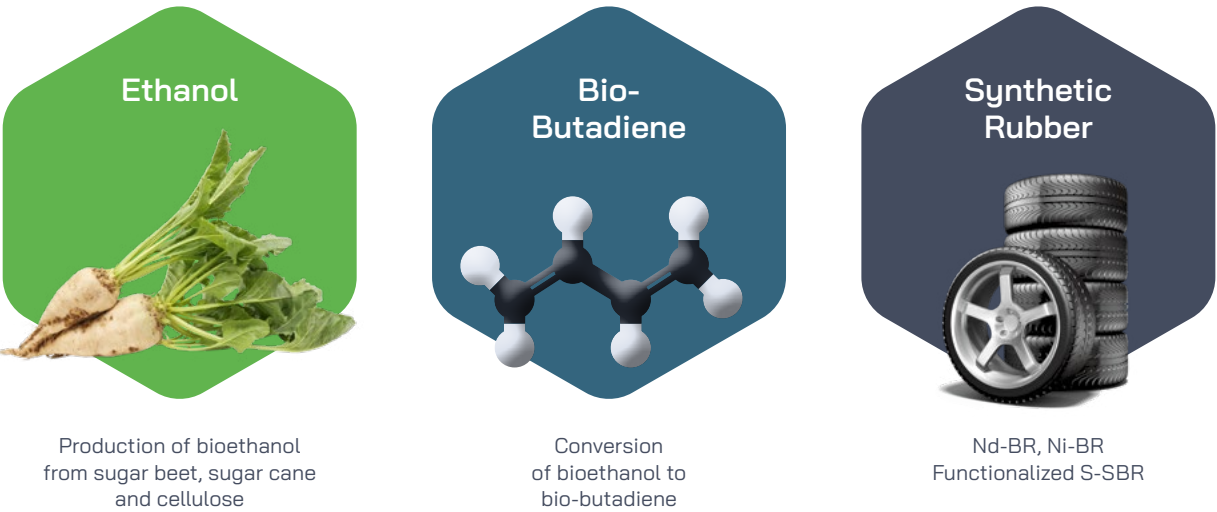
Climate neutral by 2050

## Making synthetic rubber with bio-butadiene

We want to create a world where we produce all our synthetic rubber using renewable or recycled resources. Work is already well underway to increasing the share of bio-based raw materials along the value chain so we can reduce the environmental impact of our products, and help our customers to do the same.

Our scientists have developed an advanced bio-butadiene technology that uses renewable, bio-derived ethanol feedstock to produce synthetic rubber grades for tire manufacturers – the largest customers of the synthetic rubber industry.

### BIO-BUTADIENE – A step towards a sustainable future for mobility



“ We believe the availability of sustainable synthetic rubber made from bio-butadiene will play an important role in the industry’s ability to meet the demands of modern mobility.

We have partnered with Lummus Technology to further optimize the development and commercialization of this technology, and construction of our plant is scheduled to commence in 2024 with a planned annual production capacity of 40,000 MT.

This development is a critical step in our journey to meet our sustainability targets and help our customers achieve theirs. We are proud that our technology has the potential to create a new industry standard due to its renewable sourcing, production efficiency and low carbon footprint.

# MASS BALANCE CERTIFICATION UNLOCKING CIRCULARITY

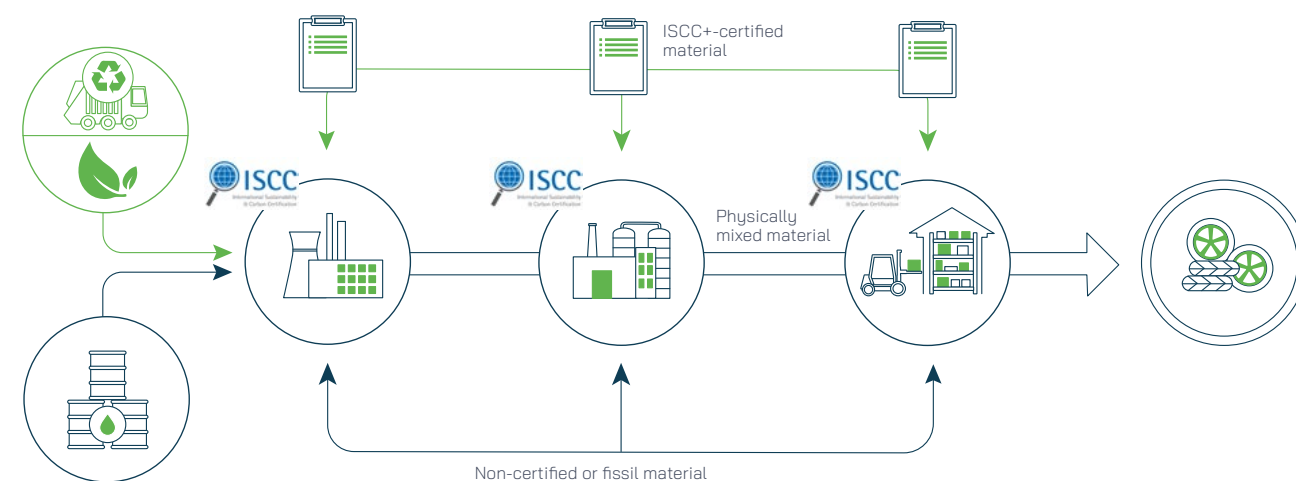
As one of the world's largest synthetic rubber producers, we are very aware of our responsibility to lead the drive to net-zero in our industry. An important milestone on this pathway was to become the first synthetic rubber manufacturer to offer its entire rubber product portfolio as ISCC Plus certified materials.

Our International Sustainability and Carbon Certification (ISCC) mass balance certified materials enable our customers to make credible environmental claims for their products. ISCC is a globally recognized standard that provides traceability throughout the supply chain. We replace a certain amount of virgin raw

materials with recycled or renewable raw materials at the beginning of the value chain and allocate them to the product ensuring input and output match – proven and reliably calculated according to certified standards.

**All of our synthetic rubber plants are ISCC Plus certified and all of our commercial grades are available as bio / circular attributed product under ISCC certification. An ISCC-certified product has the same properties as its conventional variant, meets the same specifications, and can therefore be considered interchangeable and the same.**

Input = Output – ensured by ISCC sustainability declarations



# CLOSING THE LOOP: RECYCLED RUBBER POWDER

We are committed to supporting our customers by offering a broader portfolio of sustainable high-performance materials. Synthos markets TyreXol™, a high-quality, certified recycled powder derived from car and truck treads that can be used at higher loads in rubber compounds with no compromise on performance.

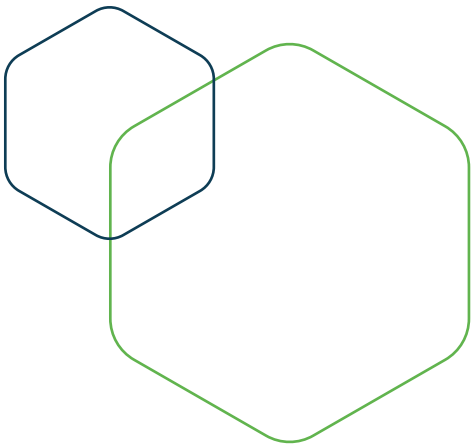
TyreXol™ is produced in Switzerland by Tyre Recycling Solutions (TRS), who offer global solutions for the collection, processing and recycling of end-of-life tires through the development and implementation of innovative technologies and business processes.

We are proud to collaborate with TRS on the future use of recycled powder in synthetic rubber formulations and to develop solutions for our customers that can help address the environmental impact of end-of-life tires.



# SOLUTION-STYRENE BUTADIENE RUBBER (S-SBR) – SPRINTAN®

Synthos manufactures a broad portfolio of functionalized and non-functionalized S-SBR grades through batch or continuous polymerization for tire and technical rubber product applications under the SPRINTAN® brand.



## SPRINTAN® Solution Styrene Butadiene Rubber (S-SBR) – functionalized

	STYRENE CONTENT, WT %	VINYL CONTENT, WT %	MOONEY VISCOSITY, ML (1+4) 100 °C	EXTENDER OIL TYPE	EXTENDER OIL CONTENT, WT %	APPLICATION / FEATURES
SPRINTAN 3402	15	26	70	–	–	Tire tread, low rolling resistance and good winter properties, very good wear and dynamical stiffness, passenger car, truck and bus tires.
SPRINTAN 4502	20	42	60	–	–	Tire tread for all-season tires, balanced performance, passenger car, truck and bus tires.
SPRINTAN 4601	21	49	50	–	–	Excellent balance of wet grip and RR in CB-filled treads, excellent processing.
SPRINTAN 4602	21	49	65	–	–	Tire tread for various tires, excellent balance of wet grip and rolling resistance.
SPRINTAN 4633	21	50	80	TDAE	23.5	Tire tread, good balance of rolling resistance, abrasion and stiffness properties, good winter performance and high miscibility with other rubbers.
SPRINTAN 918S	39	16	65	TDAE	20.0	UHP tire tread with superior wet traction / rolling resistance balance.

## SPRINTAN® S-SBR

In Schkopau, Germany using Synthos patented technology, SPRINTAN® S-SBR grades for both carbon black and silica are produced by anionic batch solution polymerization initiated by a lithium initiator and stabilized with a non-staining antioxidant.

These grades provide an excellent balance of properties in tire tread compounds for passenger car, truck, bus, summer, winter and all-season tires. SPRINTAN® functionalized S-SBR grades are used in silica and carbon black tread compounds for enhanced polymer-filler interaction. SPRINTAN® 918S with its advanced functionalization, offers outstanding wet-grip and rolling resistance properties with improved wear in tire tread compounds, including those for electric vehicles.







SPRINTAN® Solution Styrene Butadiene Rubber (S-SBR) –  
non-functionalized

	STYRENE CONTENT, WT %	VINYL CONTENT, WT %	MOONEY VISCOSITY, ML (1+4) 100 °C	EXTENDER OIL TYPE	EXTENDER OIL CONTENT, %	APPLICATION / FEATURES
SPRINTAN 1810	18	10	70	–	–	Tire tread, low rolling resistance and good winter properties, very good wear and dynamical stiffness, passenger car, truck and bus tires.
SPRINTAN 4630	25	47	55	TDAE	27.3	Tire tread, good balance of wet grip and rolling resistance, high versatility across application, good processability.
SPRINTAN 2552	25	50	52	TDAE	27.3	Tire tread, good balance between rolling resistance and wet grip, very good processing.
SPRINTAN 3041	30	41.5	55	HVN	27.3	Tire tread low rolling resistance with improved wet grip for passenger car tires, various technical rubber articles.
SPRINTAN 941S	38	27	63	TDAE	27.3	UUHP Tire tread, outstanding wet grip and dry handling properties, good wear performance.
SPRINTAN 3323	33	23	60	HVN	27.3	Tire tread, good balance of wet grip and rolling resistance, summer and all-season tires.
SPRINTAN 3324	33	23	60	TDAE	27.3	Tire tread, good balance of wet grip and rolling resistance, summer and all-season tires.
SPRINTAN 6430	40	14.4	68	TDAE	27.3	UHP tire tread, excellent wet grip and wear, mechanical properties / tear strength, high molar mass.

In Oświęcim, Poland, SPRINTAN® S-SBR grades are produced under a Goodyear license using an anionic continuous polymerization process in the presence of a lithium catalyst and stabilized with a non-staining antioxidant.

These grades are available in a wide variety of styrene and vinyl content and varying Mooney viscosity levels. Applications are predominantly for silica or carbon black tread compounds but also include solid tires, technical rubber goods and conveyor belts.





# BUTADIENE RUBBER (BR) – SYNTECA®

Synthos manufactures high- and low- cis polybutadiene rubbers under the SYNTECA® brand, which are suitable for a range of tire and other industrial applications.

Synthos' production facilities for high-cis BR are located in Kralupy (Czech Republic) and Schkopau (Germany), while low-cis BR is manufactured in Oświęcim (Poland).

## SYNTECA® Nd-BR SYNTECA® Ni-BR

Synthos produces SYNTECA® Nd-BR with a cis content of approximately 97 % under a Michelin license using a neodymium catalyst system, non-staining antioxidant and with no extender oils.

SYNTECA® Ni-BR has a cis content of approximately 96 %. It is manufactured by a solution process using an organometallic nickel catalyst which produces a consistent, light coloured polymer, non-staining antioxidant and with no extender oils.

SYNTECA® Nd-BR and Ni-BR are used in the tire industry for tread and sidewall compounds, and in other industries for a range of elastomeric products such as conveyor belts and golf balls.

Due to its low glass transition temperature, low polydispersity and linear structure, SYNTECA® Nd-BR is particularly suitable for tread compounds for the development of 'green tires', as it offers excellent wear properties and enables a reduction in fuel and energy consumption due to its very low rolling resistance.



## SYNTECA® Polybutadiene – Nd-BR and Ni-BR

PARAMETERS	UNITS	SYNTECA 44 / SYNTECA 44G	SYNTECA 63 / SYNTECA 63G	SYNTECA Ni45
Mooney ML (1+4) @100 °C	MU	44	63	45 massed
Volatile matters	% wt.	0.5 / 0.15 max 0.8	0.5 / 0.15 max 0.8	max 0.8
Total ash	% wt.	0.2 max 0.7	0.2 max 0.7	max 0.7
T <sub>g</sub> (approx.)	°C	-108	-108	-107
Cis structures content	%	98 min 96	98 min 96	min 94
Catalyst	–	Nd	Nd	Ni

Due to its excellent dynamic properties, neodymium polybutadiene is particularly suitable for tires (especially sidewalls and treads) and for conveyor belts.

SYNTECA® 63 – The combination of long molecules with a linear structure results in excellent dynamic properties that have a positive impact on rolling resistance.

SYNTECA® 44G and SYNTECA® 63G are products specifically developed for the production of golf balls.





## SYNTECA® Li-BR

SYNTECA® Li-BR is a low-cis polybutadiene that is manufactured using a lithium catalyst system.

SYNTECA® Li-BR grades are used for modifying plastics – High Impact Polystyrene (HIPS) and Acrylonitrile Butadiene Styrene (ABS), in tire compounds and in the production of other technical rubber products.



### SYNTECA® Lithium Polybutadiene – Li-BR

CHARACTERISTICS	UNITS	SYNTECA 50L	SYNTECA 50LP	SYNTECA 60LP	SYNTECA 40LPS	SYNTECA 35LPS
Mooney ML (1+4) @100 °C	MU	50	50	65	40	40
Cis structures content	%	38	38	38	38	38
Solution viscosity (5% in Styrene, 25 °C)	mPas	–	180	250	90	40
Gels content	ppm	–	max. 150	max. 150	max. 150	max. 150
APHA color	–	–	max. 15	max. 15	max. 15	max. 15
Structure	–	Linear	Linear	Linear	Star-branched	Star-branched
Application / Features	–	Tires / technical rubber goods	HIPS	HIPS	HIPS / ABS	HIPS / ABS, high gloss level

# EMULSION STYRENE-BUTADIENE RUBBER (E-SBR) – BUNA® KER®

Synthos is a pioneer in the field of E-SBR technology. Its cold polymerized, easy-to-process E-SBR grades find versatile applications in almost all areas of rubber product manufacturing industry.

Styrene-butadiene rubbers are stabilized by staining or non-staining antioxidants and are produced under the BUNA® (Schkopau, Germany), and KER® (Oświęcim, Poland) brands.

E-SBR is used in all areas of the tire and rubber products industries, including technical rubber goods such as conveyor belts, cables, industrial hoses and anti-vibration parts for the automotive industry. Non-staining rubber grades are suitable for compounds used in the production of flooring, bicycle tires, footwear, children’s toys, cables, hosepipes and various rubber articles with light color shades.



### BUNA® and KER® Emulsion Styrene Butadiene Rubber E-SBR

DRY GRADES			
GRADE	ANTIOXIDANT	Mooney ML (1+4) @100 °C	BONDED STYRENE [%]
BUNA SB 1500	Staining	50	23.5
KER 1500	Staining	50	23.5
BUNA SB 1502	Non-staining	50	23.5
KER 1502	Non-staining	50	23.5
KER 1507	Non-staining	39	23.5





BUNA® and KER®  
Emulsion Styrene Butadiene Rubber E-SBR

OIL EXTENDED GRADES WT % 27.3				
GRADE	ANTIOXIDANT	Mooney ML (1+4) @100 °C	BONDED STYRENE (%)	EXTENDER OIL
BUNA SB 1723	Staining	49	23.5	TDAE
KER 1723	Staining	51	23.5	TDAE
BUNA SB 1739	Staining	53	40	TDAE
KER 1739	Staining	55	40	TDAE
KER 1783	Staining	51	23.5	RAE
KER 1789	Staining	55	40	RAE

NITRILE BUTADIENE RUBBER (NBR) – KER®

Synthos NBR is produced in Oświęcim, Poland by low-temperature emulsion polymerization of butadiene and acrylonitrile and coagulated by a system of acid and synthetic coagulant, stabilized by a non-staining antioxidant. Three grades are produced under the KER® brand with differing bound acrylonitrile content.

These rubbers are used for manufacturing a wide range of technical products that require good

resistance to oils, fuels and greases. Due to their non-staining antioxidant content, these rubbers may be used to manufacture light- or brightly-colored products. They are also suitable for use in food contact or potable water applications.



KER® Acrylonitrile Butadiene – NBR

GRADE	ANTIOXIDANT	Mooney ML (1+4) @100 °C	BONDED ACRYLONITRILE CONTENT (%)
KER N-18	Non-staining	50	18.0
KER N-29	Non-staining	50	29.0
KER N-33	Non-staining	50	33.0

HIGH STYRENE RUBBER (HSR) – KER®

Three grades of Synthos high styrene rubbers and resins are produced under the KER® brand in Oświęcim, Poland.

They are used where manufacturers require cost-effective processing solutions for products that require high levels of rigidity and hardness including floor linings, cables, toys, footwear. They are also used as a filler alternative in rubber compounds for other industrial applications.



KER® High Styrene Rubber – HSR

GRADE	ANTIOXIDANT	BONDED STYRENE CONTENT (%)
KER 1904	Non-staining	68
KER 9000	Non-staining	83
KER 9001	Non-staining	83



# SYNTHOS AROUND THE WORLD

## Global Synthetic Rubber Map



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