



**□ - BASF**

We create chemistry

# Koresin® – The tackifier for the rubber industry



# The connecting power of Koresin®

- Koresin is the industry benchmark with regards to
  - superior tack performance
  - processing flexibility
  - reliability
  - high quality and uniformity
- Production capacity expansion to ensure all future demands
- Koresin is the only formaldehyde-free phenolic tackifier in the market
- Nearly 80 years of product expertise





# Your solution – Koresin®

## The tackifier for high quality applications

### Koresin is successfully applied in the manufacturing of

quality and premium tires of all kind

- for cars, trucks and special vehicles
- for OEM, replacement and re-treading
- in light, medium, heavy and speed use operations
- in earth and air transport rubber compounds

other industrial and technical rubber goods, such as

- conveyor belts
- power transmission belts
- hoses
- cable / roll coverings
- lining materials



# Your solution – Koresin®

## When overall performance is key

### Outstanding advantages

- High initial and long-term tackiness of rubber compounds
- Compatible with all current rubber formulations
- Processing flexibility
  - degree of tackiness can be adjusted
  - tackiness can be maintained for up to several weeks when needed
- Koresin has no negative influence on the
  - vulcanization kinetics
  - properties of the vulcanized rubber
- Proven effectiveness also in formulations with high loading of silica filler

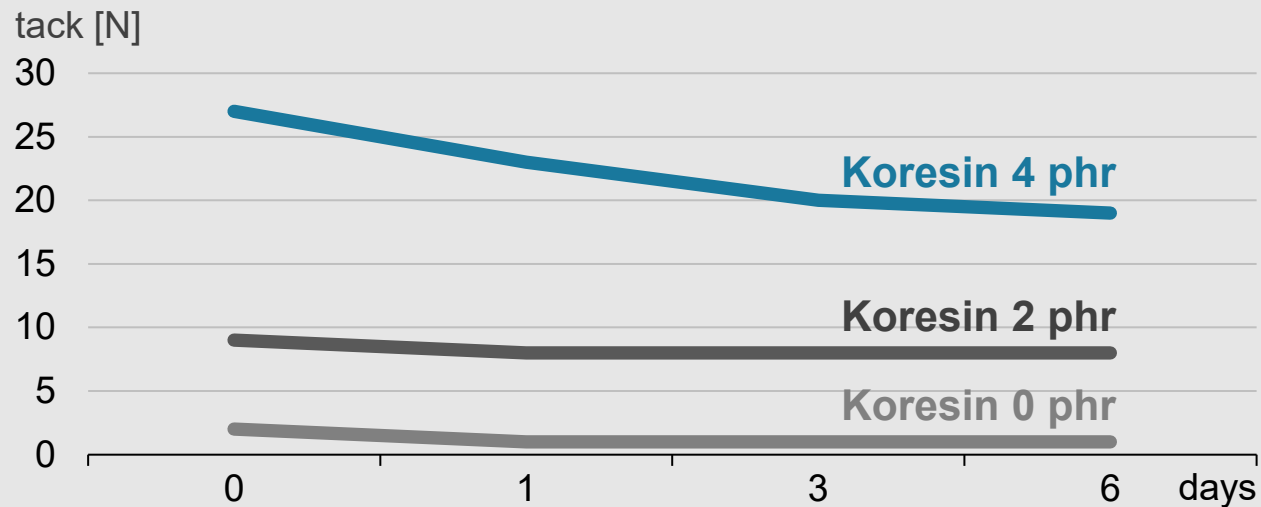


# Your solution – Koresin®

## Reliable tack at desired level

Koresin allows fine-tuning of tackiness to achieve specific requirements

Adjustment of Tackiness with Koresin



### Passenger tire sidewall:

(base formulation in phr)

Natural rubber 50

Butadiene-rubber 50

Carbon black 40

Silica 10

Plasticizing oil 10

Koresin 0 / 2 / 4

- A low loading of Koresin increased tack by 300%
- Higher loadings offer further significant improvement
- Tack is maintained over extended time periods

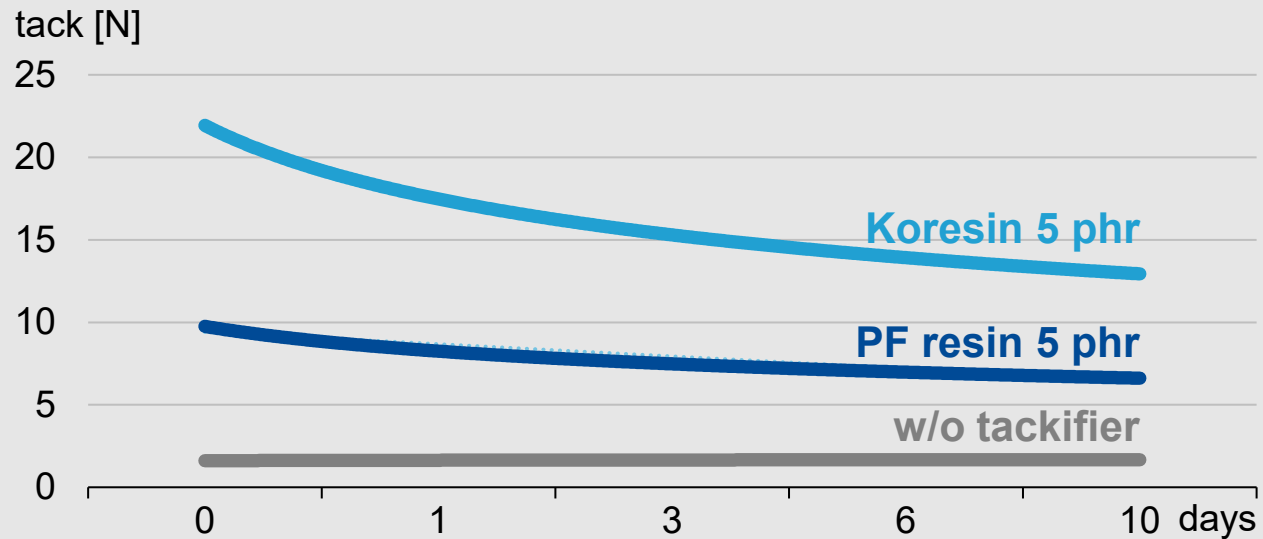


# Your solution – Koresin®

## Tack stability provides safer processing

Koresin has excellent efficiency together with long-term performance compared to standard phenol-formaldehyde based tackifiers (PF resins)

### Koresin: High performance tackifier



### Truck tire tread:

(base formulation in phr)

- Natural rubber 80
- Butadiene-rubber 20
- Carbon black 50
- Plasticizing oil 4
- Tackifier 0 / 5

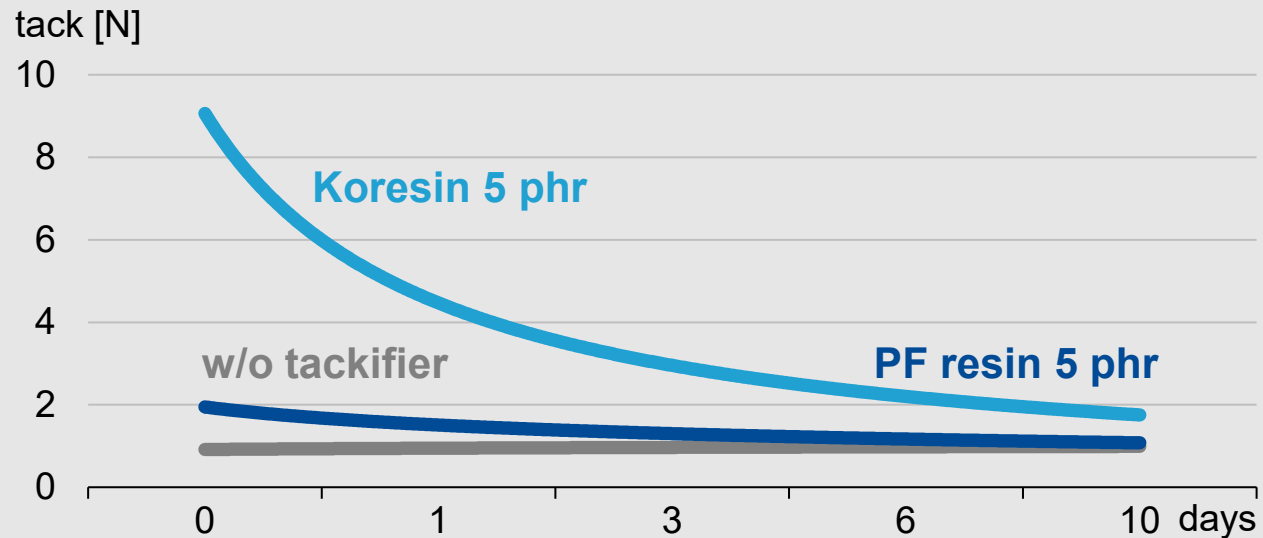


# Your solution – Koresin®

## For low rolling resistance tires

Koresin allows adjustment of tackiness according to the processing needs

### Performance of Koresin in High-Silica/ Low rolling resistance tread formulation



### Passenger tire tread:

(base formulation in phr)

- Vinyl-SBR 70
- Butadiene-rubber 30
- Carbon black 40
- Silica 80
- Silan 8
- Carbon black 10
- Plasticizing oil 20
- Tackifier 0 / 5





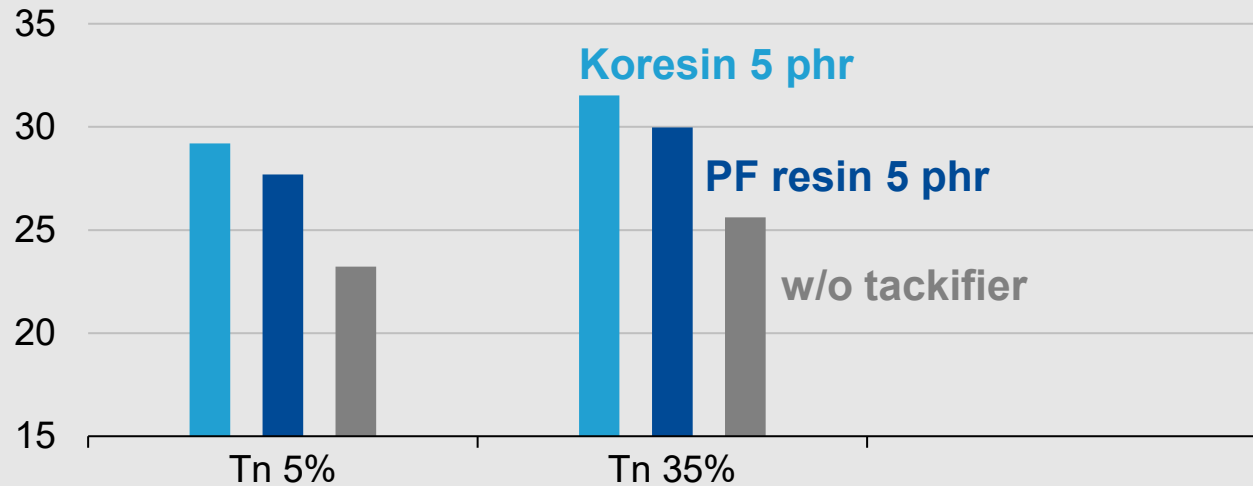
# Your solution – Koresin®

## Minor effect on vulcanization kinetics

Koresin has a lower scorch influence compared to standard phenol-formaldehyde resins

### Koresin minimizes impact on scorch time

scorch time [min]



### Truck tire tread:

(base formulation in phr)

Natural rubber 80

Butadiene-rubber 20

Carbon black 50

Plasticizing oil 4

Tackifier 0 / 5

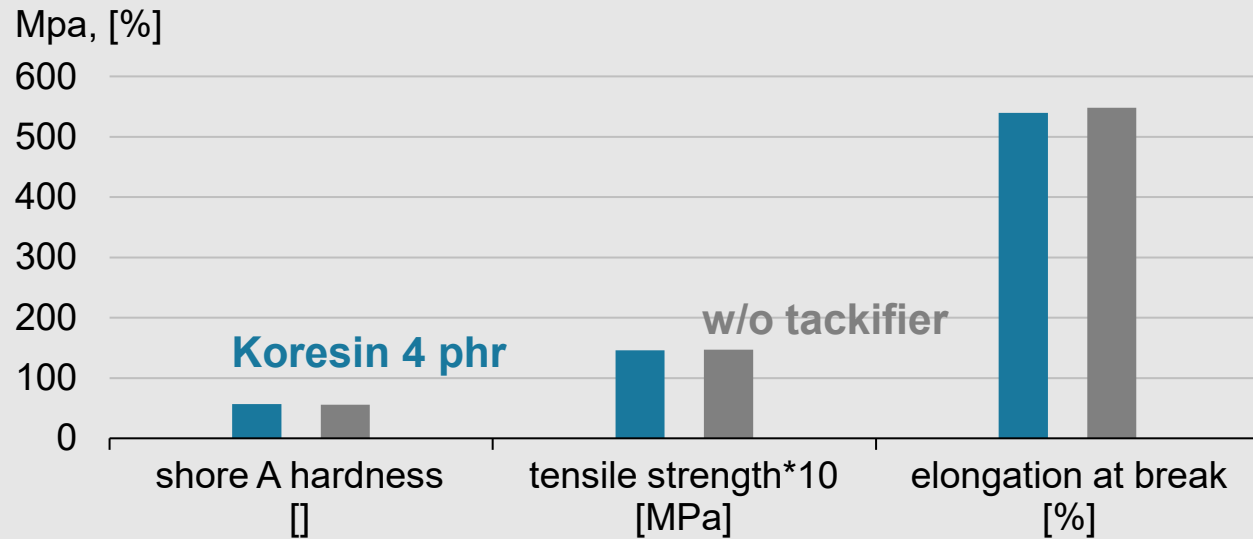


# Your solution – Koresin®

## No effect on mechanical properties

**Koresin does not reduce hardness.  
Tensile strength and elongation are maintained  
and maybe improved by use of Koresin**

**Koresin does not affect the physical properties of rubber**



### Passenger tire sidewall:

(base formulation in phr)

- Natural rubber 50
- Butadiene-rubber 50
- Carbon black 40
- Silica 10
- Plasticizing oil 10
- Koresin 0 / 4



# Your solution – Koresin®

## Sustainability and reliability included

### Global supply security is vital

BASF constantly challenges all related processes to best meet customers' expectations in terms of

- sophisticated raw materials sourcing
- compliance with the highest safety standards in each and every step of manufacturing
- professional logistics and warehousing facilities around the globe
- installed Quality and Risk Management Systems along the complete Supply Chain including a scenario-based inventory plan



# Your solution – Koresin®

## Worldwide availability

- Plant with its two Koresin production lines is part of BASF's Verbund site in Ludwigshafen
- Manufacturing facility also comprises a pelletizing and packaging line
- Pellets in 25-kilogram bags and super-sacks/big bags
- Delivered on plastic pallets
- Available worldwide





# Your solution – Koresin®

## Specifications and properties

### Specifications

Test criteria	Specification	Test method
Ubbelohde dropping point	140 – 160 °C	DIN 51801
Ring and ball softening point	135 – 150 °C	DIN 52011
Solubility in hydrocarbons	soluble	BASF method

### Properties

Physical form	yellow to brown pellets
Odor	almost odorless
Softening point (ball and ring/DIN 52011)	135 – 150 °C
Dropping point (Ebbelohde/DIN51801)	140 – 160 °C
Density (20 °C)	1.02 – 1.04 g/cm <sup>3</sup>
Solubility	soluble in hydrocarbons





# Your solution – Koresin®

## The tackifier to meet YOUR expectations

### **YOUR** Tackifier

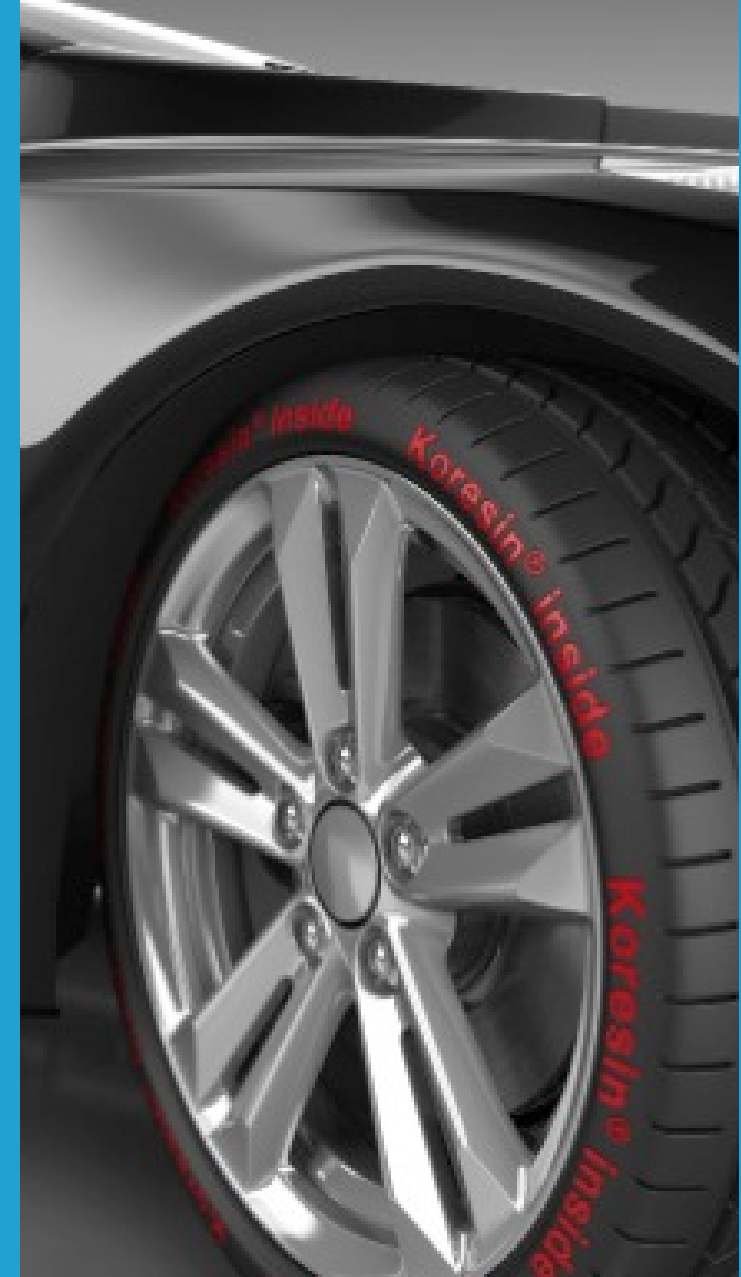
in high performance rubber applications.

### **YOUR** Solution

when overall performance is key.

### **YOUR** Satisfaction

sustainability and reliability included.





We create chemistry