

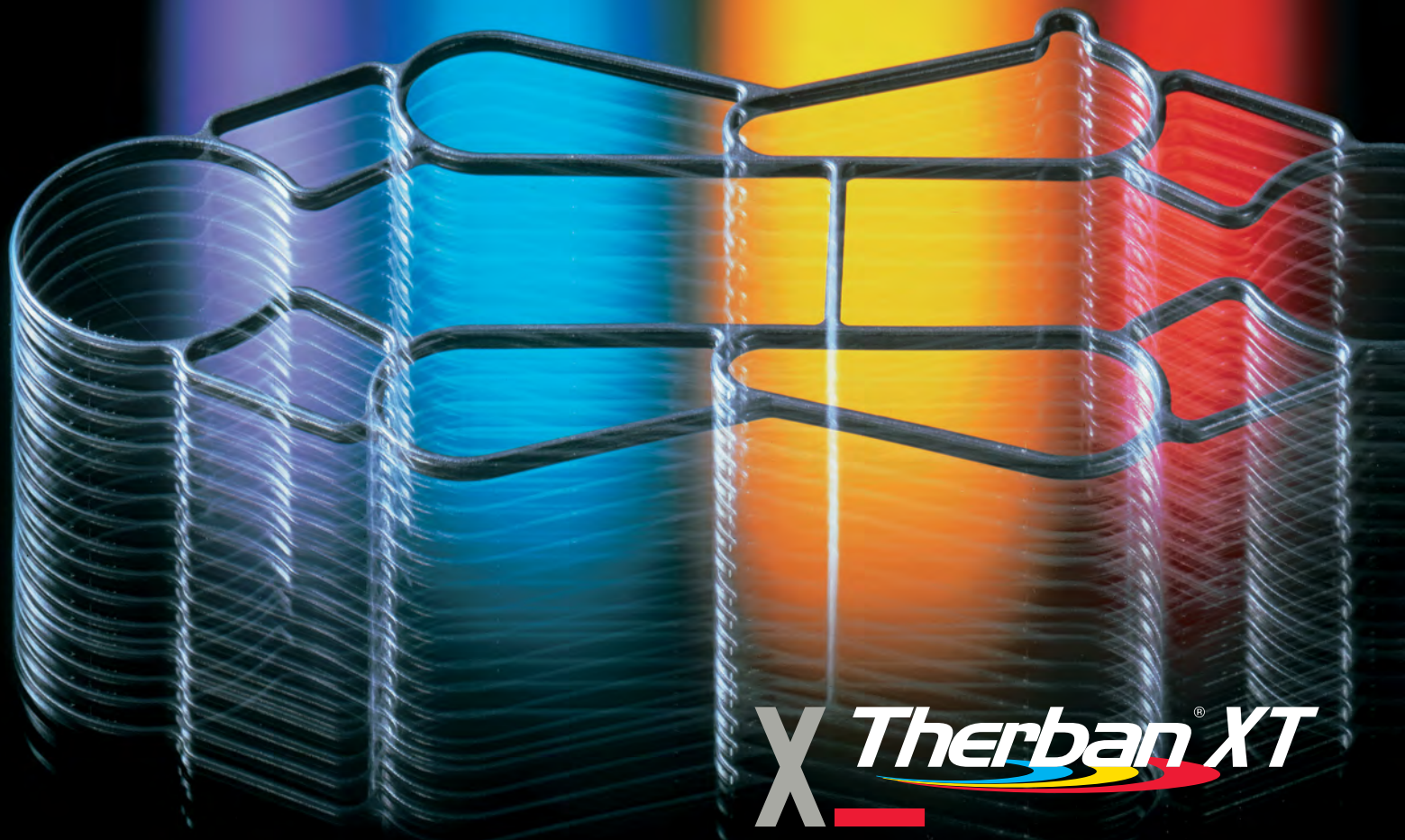
**LANXESS**  
Energizing Chemistry

**Therban® XT**

Hydrogenated carboxylated nitrile-butadiene  
rubber (HXNBR)

**The rubber for XTreme performance**

Edition 2006-09



**X Therban® XT**

# Therban® XT from LANXESS – The XTreme performance rubber

[www.therban.com](http://www.therban.com)

## Therban® XT – for applications that demand XTreme performance

Therban® XT (HXNBR) is a high modulus, strong and robust polymer designed to withstand explosive decompression and harsh chemical environments – extremely good for oil well specialties.

Therban® XT has excellent adhesion to metals, plastics, natural and synthetic fibers – extremely good for high performance belts.

Therban® XT has high hot tear strength – extremely good for rubber components for tough engineering applications.

Therban® XT has high abrasion resistance – extremely good for rubber rolls and shaft seals.

Blending of Therban® XT with regular Therban® in the presence of ZDA in a peroxide cured compound can further increase mechanical properties, enhance adhesion, Pico abrasion resistance and maintain low temperature performance. Such compounds also maintain high levels of mechanical properties at operating temperatures above 130 °C.

## How Therban® XT is created

LANXESS uses a highly selective catalyst that hydrogenates only the C=C double bonds of a carboxylated nitrile rubber (XNBR). This highly controlled process preserves both the functionality and the random distribution of the XNBR carboxyl moieties.

## Typical Therban® XT properties

- Mooney of 77 (ML1+4 @100 °C)
- 33% ACN content
- 3.5% residual unsaturation
- both sulfur and peroxide cure systems can be used
- optimal scorch safety with zinc peroxide as activator
- other cure systems applicable

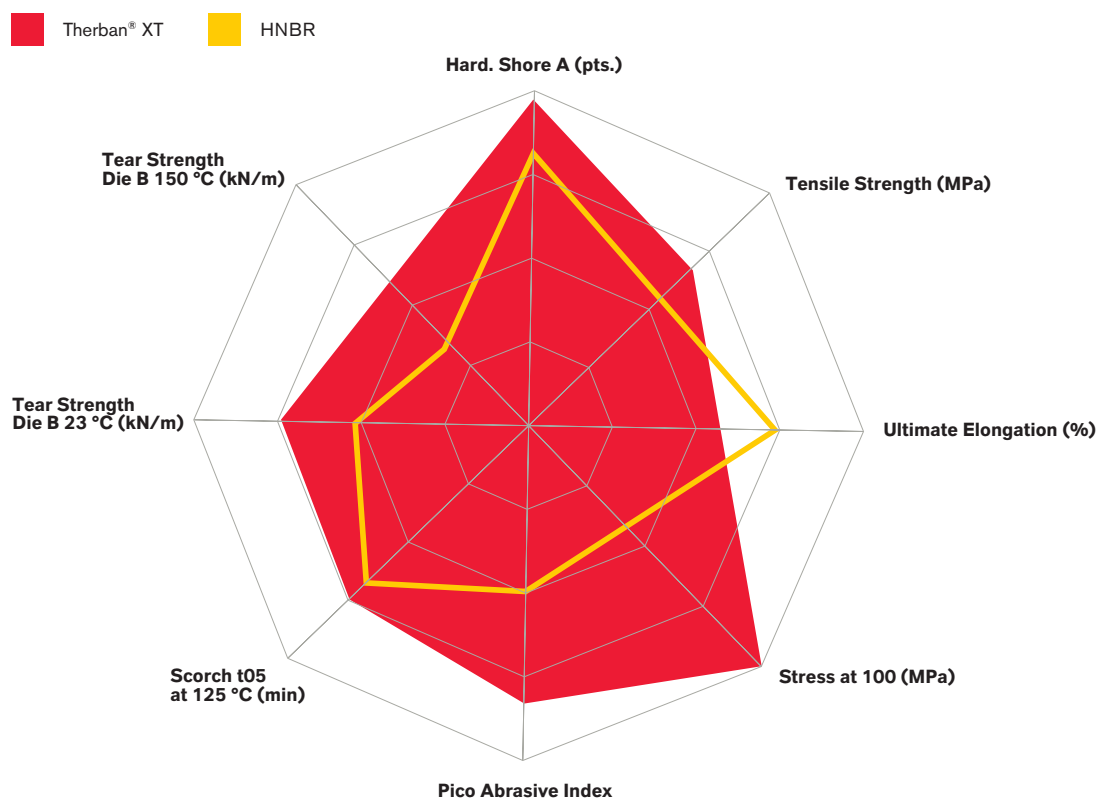
**Therban® XT** compounds exhibit unusually high tear strength at high temperatures when compared with regular HNBR and other synthetic elastomers.

**Therban® XT** compounds have higher tensile strength and higher elongation at break at high temperature than either regular HNBR or XNBR based compounds.

**Therban® XT** has excellent adhesion to the nylon fabrics used in the belt industry over a broad range of temperatures, especially at high temperature range.

**Therban® XT** abrasion resistance is even better than regular HNBR and XNBR

## HXNBR vs HNBR property comparison



## Unique Therban® XT compound properties

Conversion of butadiene units into ethylene units in the presence of carboxylic groups results in a more rugged, tougher polymer.

## Comparing Therban® XT with XNBR and HNBR

### Therban® XT physical properties at elevated temperatures

- better physical properties than XNBR and HNBR at temperatures up to 170 °C
- maintains excellent tear strength at all temperatures
- superior aging resistance to NBR or XNBR

### Therban® XT abrasion performance

- clearly outperforms the abrasion resistance of HNBR

### Therban® XT adhesion performance

- improved adhesion to natural fibers, fabrics, metals and plastics
- especially to those substrates having polar groups
- improved physical properties at higher temperatures

### Therban® XT processing characteristics

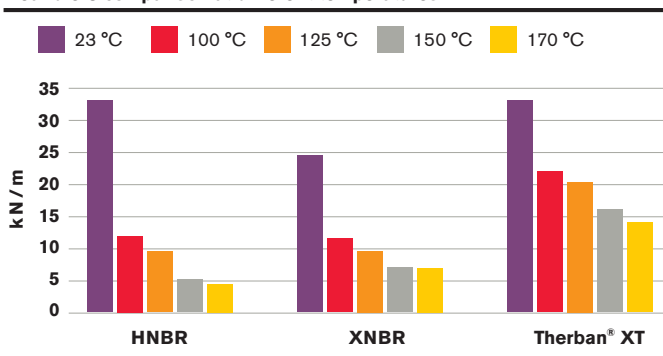
The presence of carboxyl groups and excellent high temperature adhesion demand processing care including:

- lower mixing temperatures with a drop at <150 °C recommended
- use of processing aids such as stearic acid, Armeen 18D, Vanfre VAM or low molecular weight polyethylene to reduce stickiness
- addition of metal curatives at second stage of mix
- to get better scorch safety only use ZnO<sub>2</sub> (neither ZnO nor MgO)
- compounds with white fillers must be monitored to prevent scorching
- succinic anhydride/phthalic anhydride can improve scorch safety in sulfur and peroxide cure systems

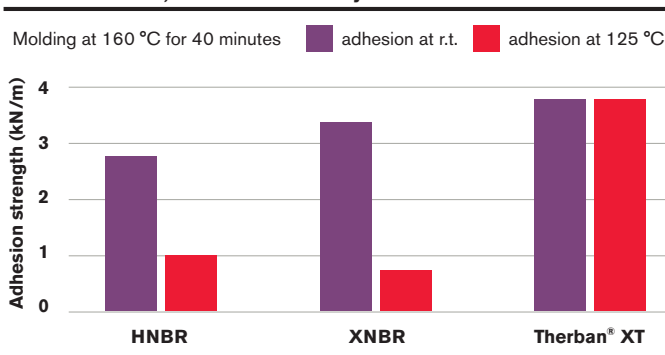
### Therban® XT blends with Therban®

- modulus and tensile strength improve by blending with Therban® and ZDA in a peroxide cured compound
- for goods with high dimensional stability, low heat built-up, very good tear and abrasion resistance
- blending with Therban® LT also improves low temperature properties
- Pico abrasion resistance can be doubled by blending as little as 25 phr Therban® XT into the recipe

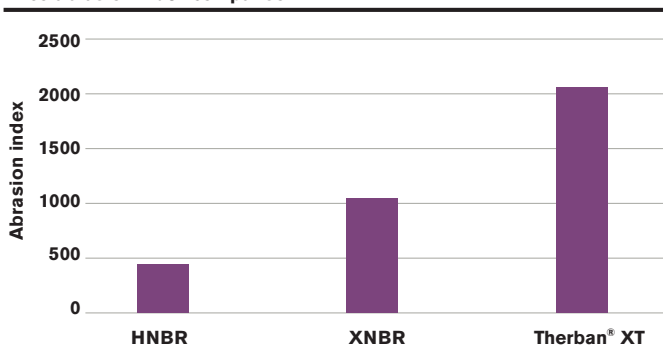
Tear die C comparison at different temperatures



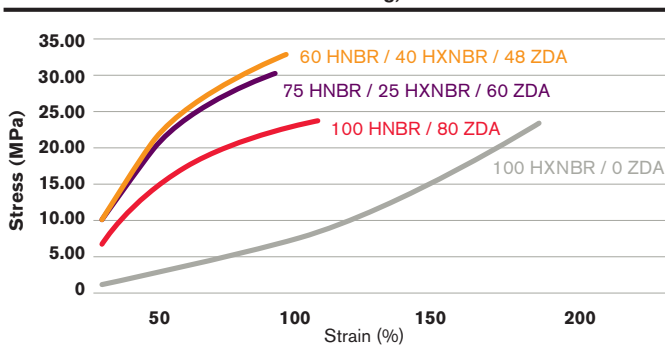
Rubber adhesion, Pirelli adhesion to nylon fabric



Pico abrasion index comparison



Therban® XT / Therban® with ZDA blending, Stress-strain at 23 °C



Product safety: Relevant safety data and references as well as the possibly necessary warning labels are to be found in the corresponding safety data sheets.

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