



NAUGARD **BIO-XL**™

SUSTAINABILITY WITHOUT COMPROMISE.

ULTRA-ACCELERATOR FOR
TIRES

MANUFACTURING EXCELLENCE
PRODUCT PERFORMANCE
GLOBAL FOOTPRINT

SI Group

INTRODUCING NAUGARD BIO-XL™:

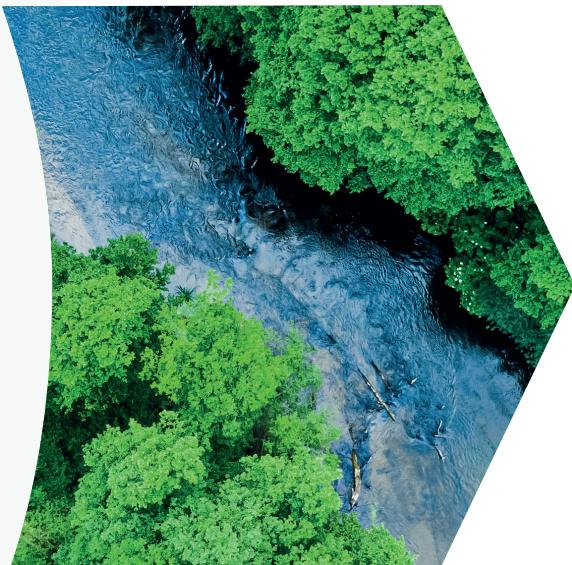
An ultra-accelerator that contains over

85% BIO-BASED MATERIALS

Developed as part of our continued focus on sustainability.

BIO-SOURCED TECHNOLOGY:

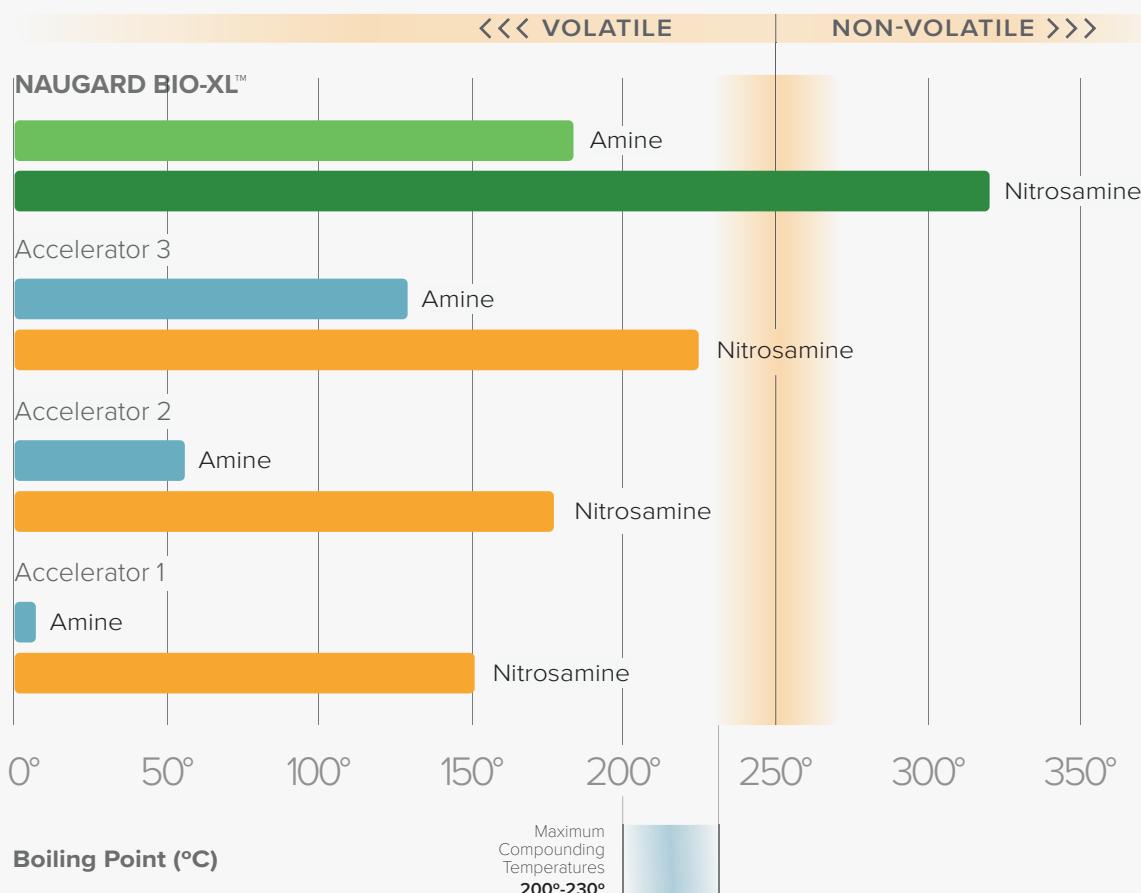
SI Group's NAUGARD BIO-XL™ ultra-accelerator is a game changing innovation that uses bio-sourced technology without compromising performance. Designed with the future of the rubber industry in mind, NAUGARD BIO-XL™ is an environmentally friendly, high-efficiency solution.



SAFETY RESULTS:

NAUGARD BIO-XL™ ultra-accelerator is free from Substances of Very High Concern (SVHC).

NAUGARD BIO-XL™ does not generate harmful nitrosamines*



Volatility of Amines and Their Corresponding Nitrosamines.

*As listed in TRGS552.

OPTIMIZING PERFORMANCE:

By optimizing cure characteristics and crosslinking efficiency, NAUGARD BIO-XL™ ultra-accelerator effectively enhances key tire properties, such as wet grip and fuel efficiency.

KEY PERFORMANCE ADVANTAGES:



Faster curing
at enhanced
scorch safety



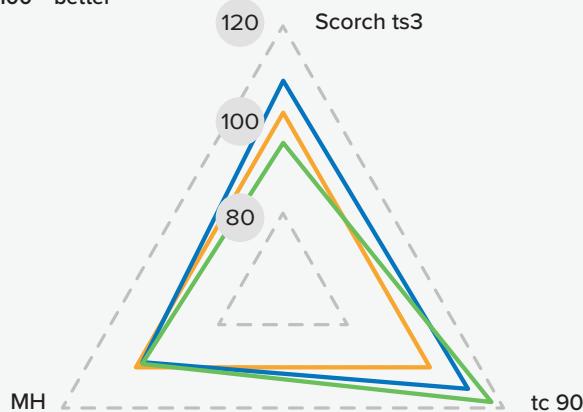
Improved
crosslinking
efficiency



No harmful
nitrosamines

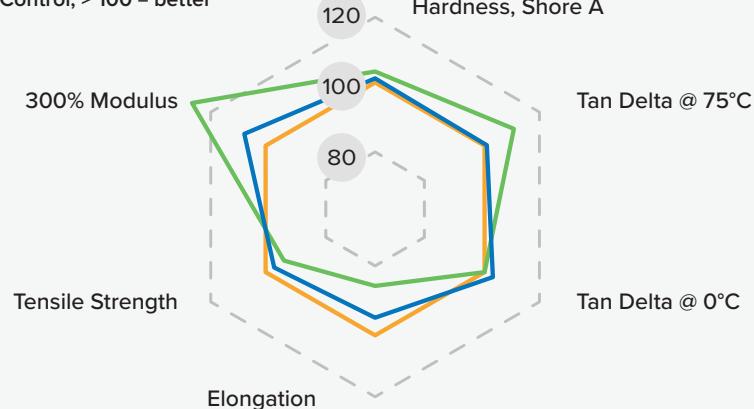
Cure Characteristics

% vs % vs Control, > 100 = better



Mechanical & Dynamic Properties

% vs % vs Control, > 100 = better



When tested in an SSBR/BR silica-filled tread formulation, replacing 2 phr of DPG (diphenyl guanidine) co-accelerator by only 1 phr of NAUGARD BIO-XL™ ultra-accelerator, NAUGARD BIO-XL™ boasts a combination of better wet grip as well as rolling resistance lab indicators (tan delta 0°C/75°C). It offers comparable hardness, modulus @ 300% elongation, and tensile strength. With further optimization of the curative package, the observed reduction in elongation at break could be balanced out.



NAUGARD BIO-XL™ IN TIRE APPLICATIONS:

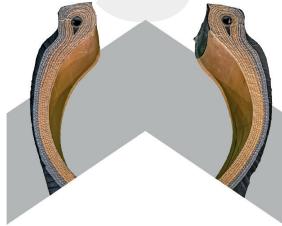
Beyond the demonstrated example in an SSBR/BR silica tread formulation, NAUGARD BIO-XL™ ultra-accelerator can be used in a variety of tire treads and other components:



1
Tread and
undertread



2
Carcass, sidewall and
belt skim compounds



3
Bead filler and
chafer components

By incorporating NAUGARD BIO-XL™ into these applications, manufacturers can enhance the performance and sustainability of their rubber products.

SI GROUP'S COMMITMENT TO



SUSTAINABILITY AND PERFORMANCE:

As a global leader in cutting-edge technology, we specialize in performance additives, process solutions, active pharmaceutical ingredients, and chemical intermediates. Our solutions cater to a wide array of industries and applications, delivering remarkable outcomes. We add value by elevating the quality, performance, and longevity of numerous everyday items. We are sustainability without compromise.





NEXT-GEN TECHNOLOGY

NAUGARD BIO-XL™ represents next-generation ultra-accelerator technology that pushes the envelope

OF IMPROVED

sustainability

&

performance

solidifying its position as a game-changer in the rubber industry.

CONCLUSIONS



HIGH PERFORMANCE

DPG replacement with improved sustainability

- Optimized cure characteristics
- Improved dynamic performance in tread
- +85% Bio-Sourced

Samples available in 70% active solid form.

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#AcceleratedSustainability



For more information visit
siigroup.com

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