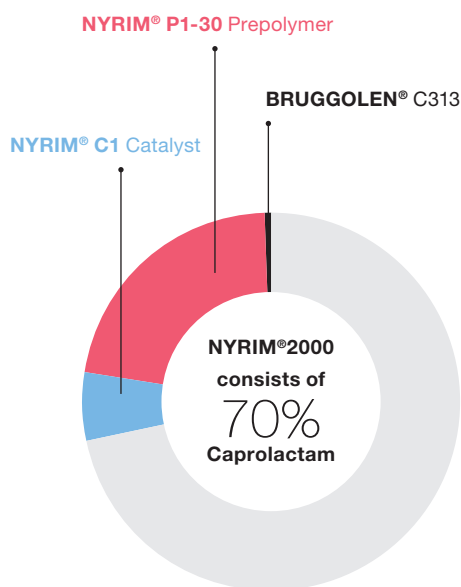


# AP-NYLON® Additives

Creating the missing link.





## NYRIM®

### Impact Resistance Down to the Extreme Cold

**NYRIM®** is a thermoplastic material noted for its exceptionally high shape stability over a temperature range of -40 to 140°C. It distinguishes itself by its outstanding impact strength and impact resistance and thus lends itself to “rough and tough” applications not accessible to other materials.

The unique nature of **NYRIM®** is due to the incorporation of elastomers into its Polyamide 6 backbone. The level of elastomer determines the characteristics of this copolymer and is adjusted by the elastomeric activator during the polymerization reaction - a 10% level from **NYRIM®1000** up to 40% from **NYRIM®4000**.



NYRIM® for Rough and Tough Applications

		AP-NYLON®	NYRIM®		
			1000	2000	4000
Impact resistance (Izod) at 23°C	[kJ/m²]	4	10	30	no fracture
Impact resistance (Izod) at -40°C	[kJ/m²]	2	7	9	no fracture
Elongation at fracture	[%]	6	40	270	420
Hardness (Shore D)	[-]	85	79	74	59
Modulus of elasticity (tensile test)	[MPa]	3500	2500	1700	500
Tensile strength	[MPa]	80	58	47	26

## Brüggemann

### Your “One-Stop” Supplier

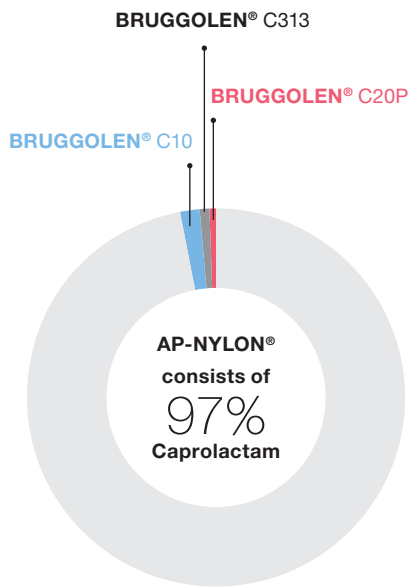
**Brüggemann** provides all the necessary base materials for production of **AP-NYLON®** and **NYRIM®** parts. Recent developments of **AP-NYLON®** based composites reveal the opportunity to extend the application range into the future.



AP-NYLON® Nature and Colored

As a leading global supplier of these specialty products, we are your “one-stop” source, backed up by our in-house R&D and advanced application laboratory in Heilbronn. Our team of experts can support and assist you with any new application, providing advice and trial service all the way through to the production stage.

In order to support your developments we can also supply dedicated small scale samples.

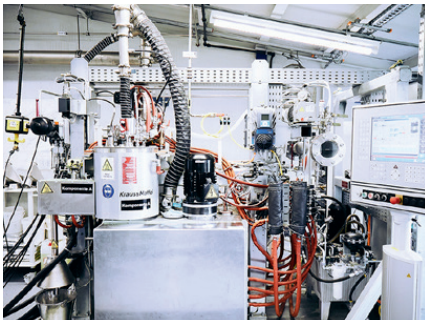


## AP-NYLON® Caprolactam The Ideal Base for Cast Polyamides

Cast nylon is produced via the anionic polymerization of **AP-NYLON®** Caprolactam. The products of the polymerization exhibit outstanding material properties such as high impact strength, superior abrasion resistance and vibration damping, exceptionally low inherent stresses in a material with a high degree of crystallinity.

The casting process requires temperatures of 100 to 160°C and no pressure during molding. It is suitable for a variety of molding techniques - vertical and centrifugal casting, rotomolding - and also allows the production of parts with hollow geometries.

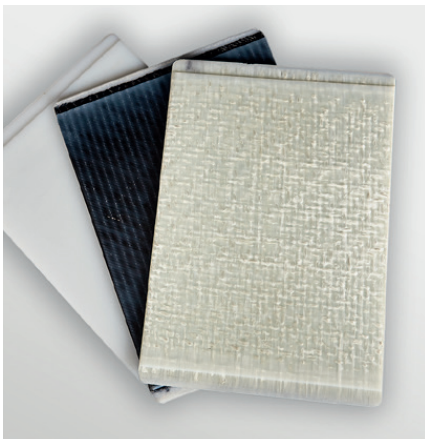
A highly efficient process requiring 2% or less of **BRUGGOLEN®** catalyst and activator to affect the polymerization, thus providing a highly cost effective system for moldings which are difficult to manufacture via other means.



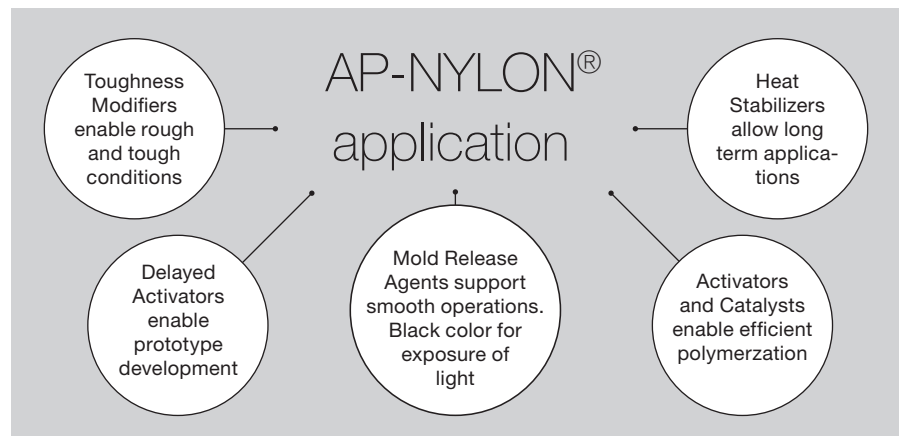
RTM-Line in our Application Lab

## BRUGGOLEN® C Additives for AP-NYLON® Cast Polyamides

**Brüggemann** supplies a portfolio of additives such as catalysts, activators for prolonged open times and toughness enhancer to assist users in realizing a host of products - including advice for application developments.



Thermoplastic AP-NYLON® Composites



## Additives for the Activator Side

Solid Activators for AP-NYLON®		Dosage*	Packaging
BRUGGOLEN® C20P	effects fastest casting	0.5 to 1.5%	70 kg plastic drums
BRUGGOLEN® C25	extends open time before solidification	0.5 to 1.5%	25 kg cardboard box

Polymeric Activators for NYRIM®			
NYRIM® P1-30 Prepolymer	viscous elastomeric activator	15 to 44%	25 kg steel drum
NYRIM® P1-20A Prepolymer	viscous elastomeric activator for low dosage	11 to 22%	25 kg steel drum
BRUGGOLEN® TP-C1312	viscous elastomeric activator	4 to 40%	25 kg steel drum

Liquid Activator for AP-NYLON®			
BRUGGOLEN® C235	N-Ethylpyrrolidon-free activator	0.5 to 1.5%	60 kg steel drum

BRUGGOLEN® Stabilizers and Colors			
BRUGGOLEN® C313	stabilizer for temperatures up to 120°C	0.3%	25 kg cardboard box
BRUGGOLEN® TP-C1608	stabilizer for temperatures up to 150°C	0.3%	25 kg cardboard box
BRUGGOLEN® C403	black dye	< 0.1%	15 kg cardboard box
BRUGGOLEN® C407	blue dye	0.05%	1.5 kg steel can
BRUGGOLEN® TP-C1704	light stabilizer	0.5%	25 kg cardboard box
NYRIM® Black Masterbatch	viscous black color	0.2 to 0.5%	5 kg steel can

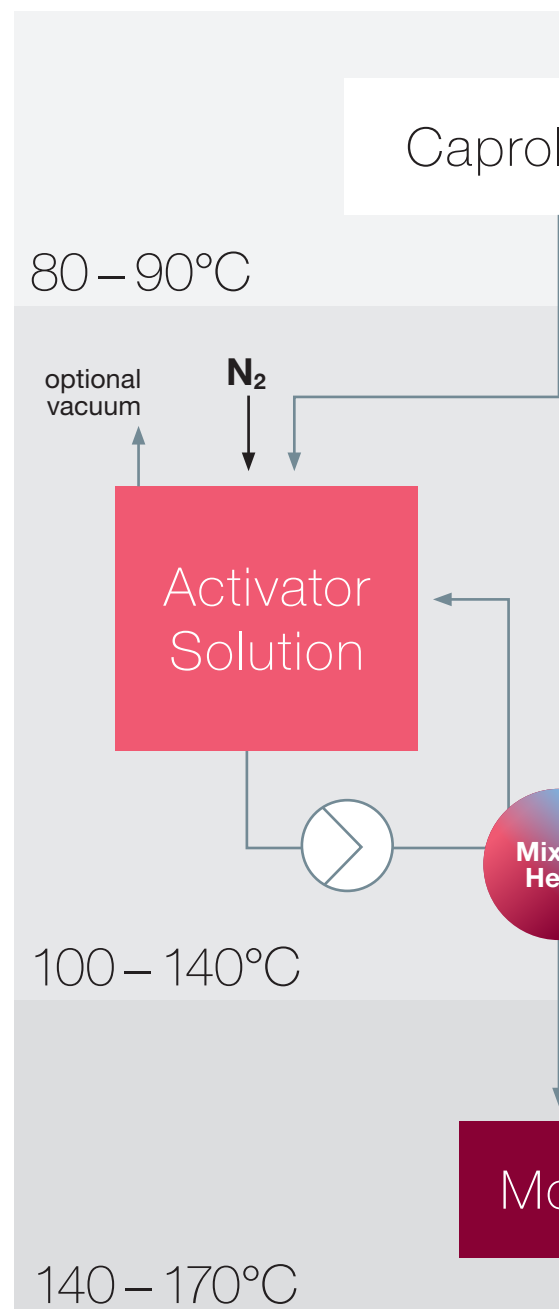
NYRIM® Additives			
NYRIM® Mold Release B	release agent	0.2 to 0.5%	25 kg cardboard box
NYRIM® Foam Stabilizer	reduces macroscopic shrink of molding	0.3%	5 kg steel container
NYRIM® Additive 6 Plus	improves toughness	2 to 5%	25 kg steel drum

\*dosage percentage based on total casting weight

## Caprolactam

The Monomer for AP-NYLON®	
AP-NYLON® Caprolactam Flakes	solid monomer for anionic polymerization
Caprolactam Liquid (AP-Quality)	molten monomer for anionic polymerization

\*dosage percentage based on total casting weight

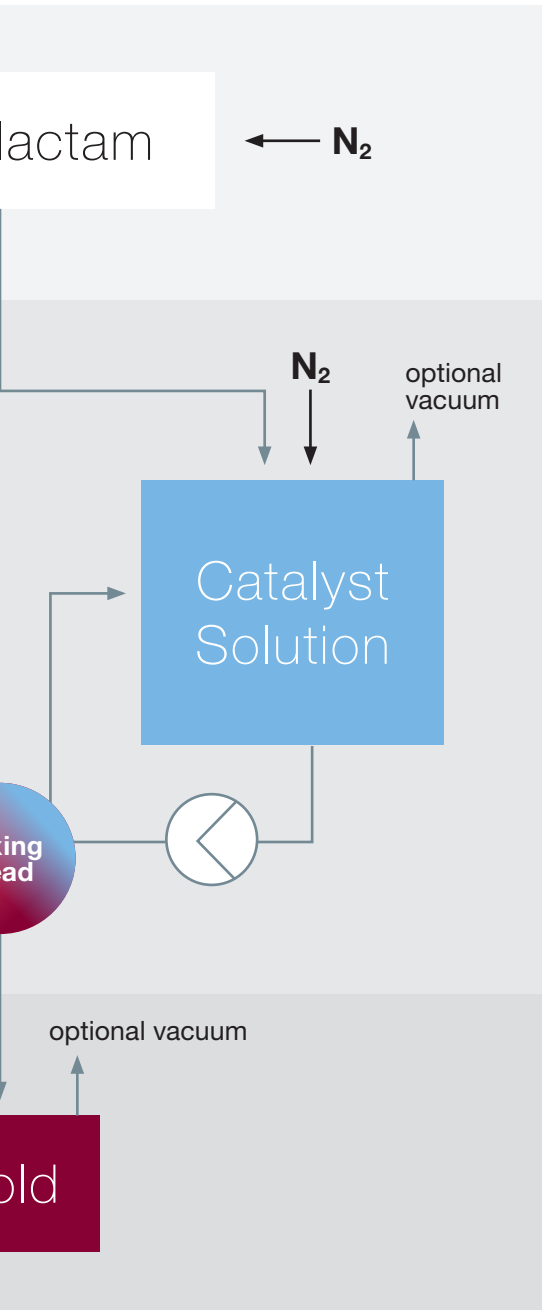


## Mold Release

External Mold-Release for NYRIM® and AP-NYLON®	
NYRIM® Mold Sealer	reduces sticking to the mold

\*dosage percentage based on total casting weight

	Dosage*	Packaging
on	98 to 56%	25 kg metalized plastic bags / 1250 kg per palette
on	98 to 56%	full-truck-loads ca. 25t



	Dosage*	Packaging
	Once per shift	5 l steel container

## Additives for the Catalyst Side

Catalyst for AP-NYLON®		Dosage*	Packaging
BRUGGOLEN® C10	solid sodium based catalyst	0.8 to 2.2%	20 kg plastic bag 50 kg plastic drum
BRUGGOLEN® TP-C1601	solid methanol-free catalyst	0.8 to 2.2%	20 kg plastic bag

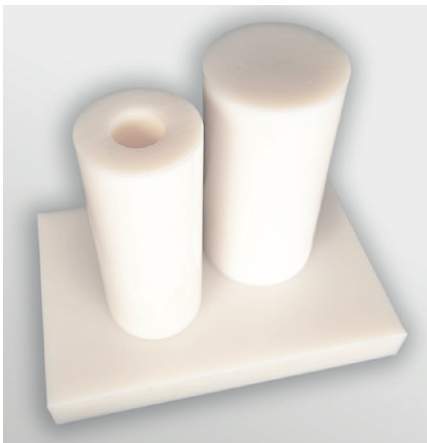
Catalyst for NYRIM®			
NYRIM® C1 Catalyst	solid magnesium based catalyst	4 to 8%	20 kg plastic bag 40 kg plastic drum

Toughness Modifier for AP-NYLON® for the Catalyst Side			
BRUGGOLEN® C540	viscous elastomer	1.5 to 25%	200 kg steel drum

\*dosage percentage based on total casting weight



AP-NYLON® Gears



Semi-finished Goods: Plates and Rods

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