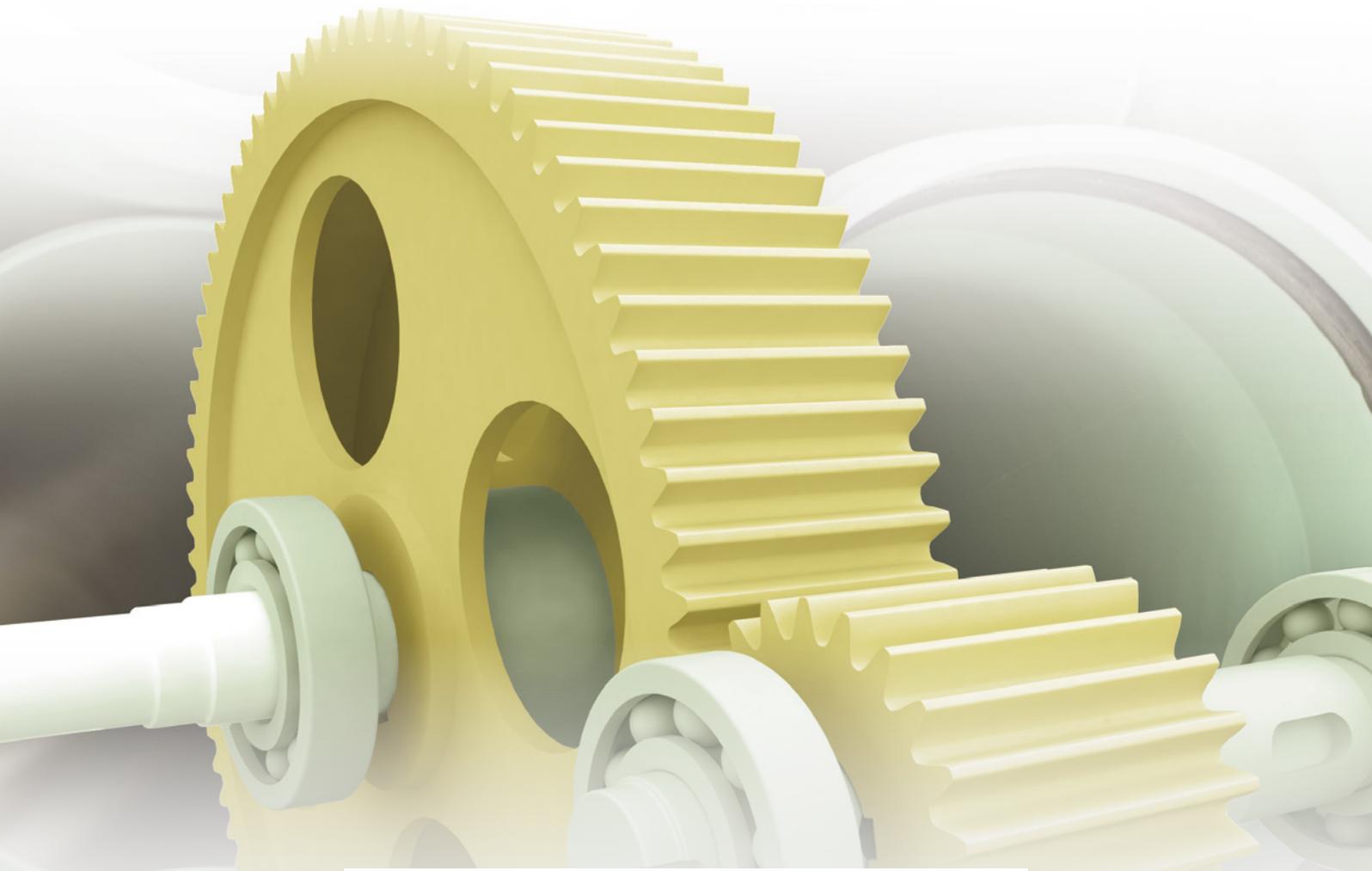
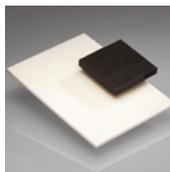


QUALITY PERFORMS.



Cast nylon

Additives for high-performance plastics



QUALITY WORKS.

LANXESS
Energizing Chemistry

CAST NYLON – AN ENGINEERING PLASTIC USED IN EXTREME SERVICE, SEMI-FINISHED AND FINISHED PRODUCTS

The manufacturing process

Cast nylon is a high-performance engineering thermoplastic used in a wide range of industrial applications. It is produced by anionic polymerization of caprolactam, enabled through the addition of special activators and catalysts.

Versatility of use

Low production costs

Flexibility of processing

The finished product is an extremely high-molecular weight and high-crystalline polyamide used in a multitude of products, such as plates, rods, tubes, drive wheels, pulleys, gear-wheels and bearings. It is also used widely in the field of tank construction.

The exothermic polymerization process takes place at atmospheric pressure between 120 and 150 °C. The heat energy supplied is supplemented by the exothermic reaction taking place in the mold. Thus, the overall energy requirement is substantially lower than with other processing methods used for thermoplastic polymers. Since no pressure is applied while filling the molds, the shaped parts are almost completely free from internal stress. All known casting methods can be used for the production of cast nylon:

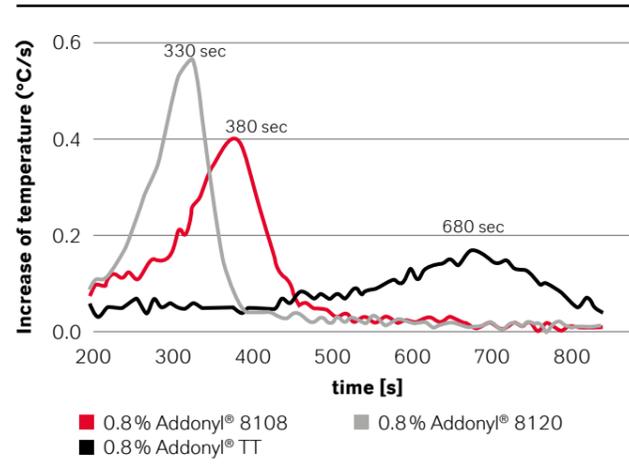
Vertical casting

In this method, the lactam cast is poured into a stand form (plates, sticks). Gear wheels, pulley blocks etc. are then milled from these produced materials.

Centrifugal casting

A form is rotated around a central axis at a high angular speed. The polymerizing polyamide mass (caprolactam) is pressed against the wall of the form by the centrifugal force and hardens there.

Melt temperature 120°C / mold temperature 160°C + 2% Addonyl® Kat NL



Rotomolding

The reactive melt is added to a hollow form and immediately turned around two axes. The angular speed is low at first. This causes a mire of reacting material in the deepest part of the mold. As the mold continues to turn, the viscosity of the material increases and subsequently begins to uniformly build up on the walls.

Processing information

The reaction rate depends on the following factors: melt temperature, activator content, catalyst content.

The recipe and reaction speed are chosen in compliance with the processing requirements, i.e. dosing time, specific surface, molding weight and processing technique.

The formula shown below is a standard formulation. For any kind of modified formula (e.g. extended pouring time or cold impact resistance), please consult our qualified technical personnel at plastic.additives@lanxess.com or by telephone.

Standard recipe	
Raw materials	PA 6 G
Caprolactam	97.5 - 98.7%
Catalyst	0.8 - 1.5%
Activator	0.5 - 1.0%

HIGH-GRADE ADDITIVES FOR OPTIMUM MATERIAL PROPERTIES

Our large product portfolio

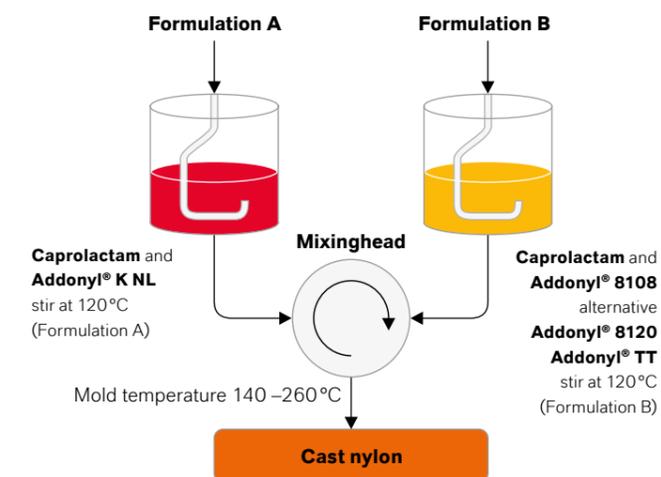
Additives made by LANXESS' Additives business unit are designed to provide cast nylon with its unique material properties in terms of impact strength, vibration absorption, abrasion resistance and lubricity. The material can be subjected to sawing, drilling, milling, turning, grinding, polishing, welding and printing.

- Addonyl® Kat NL is a catalyst based on Na-lactamate.
- Addonyl® 8108 is a liquid, highly effective activator with excellent handling properties, based on poly-isocyanate.
- Addonyl® 8120 is a powdery, highly effective activator based on a blocked diisocyanate.
- Addonyl® TT is an activator for PA 6 G with pyrogenous silicic acid (< 1%) as a fluxing agent. It is used to increase pouring time at melt temperatures up to 120 °C.
- Addonyl® 8073 is a high-molecular polyol used in rotomolding to prevent the formation of voids and pinholes. Additionally, the impact value and the machinability of the nylon casting are also improved through the use of this additive.
- Addonyl® 8112 is a triamine used as a cold impact resistance modifier for PA 6 G. A block copolymer is obtained by the addition of amine at a dosage between 10 and 15%. High concentrations are used when an extremely high degree of toughness at subzero temperatures is required.
- Addonyl® P is an activator based on an aromatic carbodiimide for PA 12 casting. Addonyl® P can prolong pouring time.

Thus, all the additives required for the manufacture or modification of cast nylon are available from Rhein Chemie Additives. The caprolactam can be sourced through LANXESS' HPM business unit.

With this combination, we offer our customers high quality products, convenient availability, shortened distribution channels, and we are always available for expert advice.

Manufacturing process of cast nylon in an unpressurized atmosphere



Additional additives for manufacturing cast nylon: Addonyl® 8112, Addonyl® 8073

Product portfolio

	Product name	Supply form	Dosage	Packaging
Catalyst	Addonyl® Kat NL	Scales	0.8 - 1.5%	40 kg
Activator PA 6 G	Addonyl® 8108	Liquid	0.5 - 1.0%	60 kg
	Addonyl® 8120	Powder	0.5 - 1.0%	40 kg
	Addonyl® TT	Powder	0.5 - 1.0%	20 kg
Activator PA 12 G	Addonyl® P	Pastilles	0.8 - 1.5%	20 kg
Additives	Addonyl® 8073	Scales	0.5 - 2.0%	20 kg
	Addonyl® 8112	Liquid	5.0 - 15.0%	200 kg



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Energizing Chemistry

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Our technical advice – whether verbal, in writing or by way of trials – is given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. It does not release you from the obligation to test the products supplied by us as to their suitability for the intended processes and uses. The application, use and processing of the products are beyond our control and, therefore, entirely your own responsibility. Should, in spite of this, liability be established for any damage, it will be limited to the value of the goods delivered by us and used by you. We will, of course, provide products of consistent quality within the scope of our General Conditions of Sale and Delivery.

Addonyl® is a registered trademark of LANXESS Deutschland GmbH, Germany.