

SIMONA



SIMONA® PP-H AlphaPlus®

Added value in chemical tank and equipment engineering

GLOBAL THERMOPLASTIC SOLUTIONS

SIMONA® PP-H AlphaPlus® – Added value in chemical tank and equipment engineering

SIMONA® PP-H AlphaPlus® is a homopolymeric polypropylene (PP-H) featuring a specially modified formula that makes it the perfect choice for applications within the area of industrial tank and plant engineering.

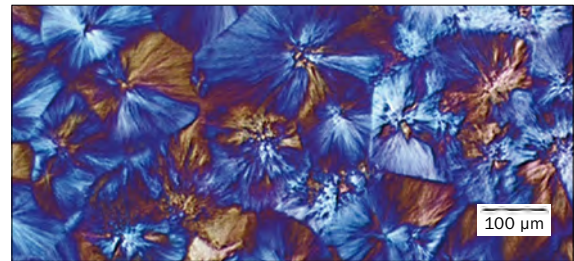
Compared to standard PP-H, SIMONA® PP-H AlphaPlus® offers the following benefits:

- Finer and more stable alphacrystalline structure
- Superior notched impact strength and enhanced rigidity
- Improved processing properties and welding properties
- Longer service life (FNCT)
- Improved chemical resistance and superior stress crack resistance
- Additional safety reserves even for critical applications
- Excellent value and highly cost-effective

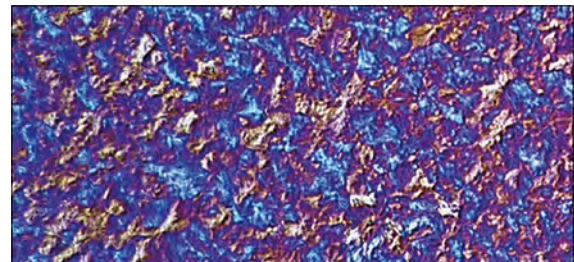
Finer and more stable alphacrystalline structure

Using an adapted processing method and introducing a special nucleating agent, we have created a PP-H with an α -crystalline modification that offers a number of genuine advantages even in challenging fields of application.

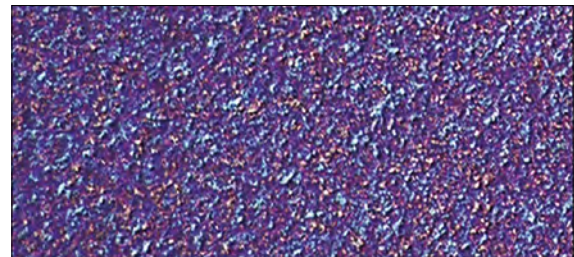
In SIMONA® PP-H AlphaPlus® we have developed a superb solution tailored to the requirements of industrial tank and plant engineering.



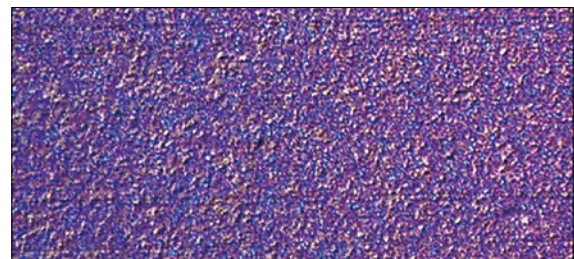
PP-H, non-nucleated



PP-H, mildly α -nucleated

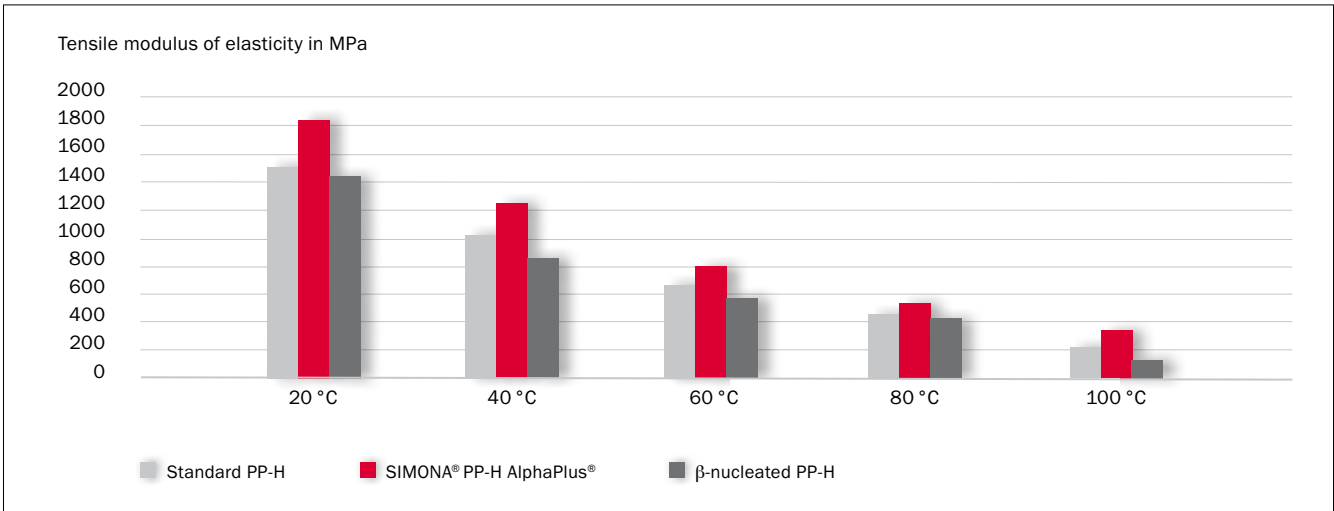


PP-H, β -nucleated



SIMONA® PP-H AlphaPlus®

Photographs of PP-H types taken under an optical microscope

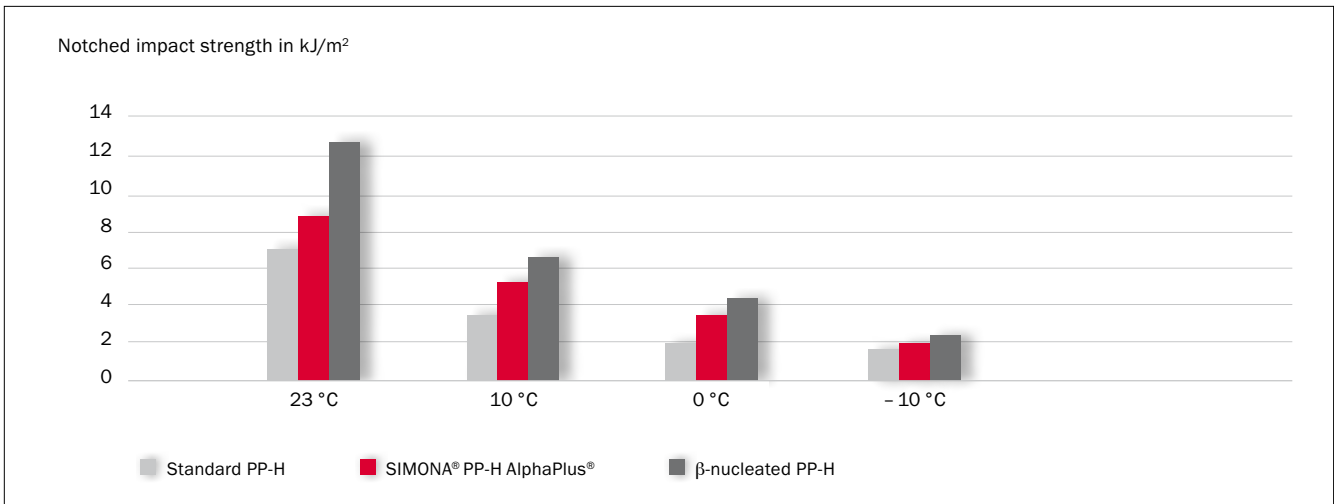


Modulus of elasticity in various types of PP (single measurement on pressed sheets)

Superior notched impact strength and enhanced rigidity

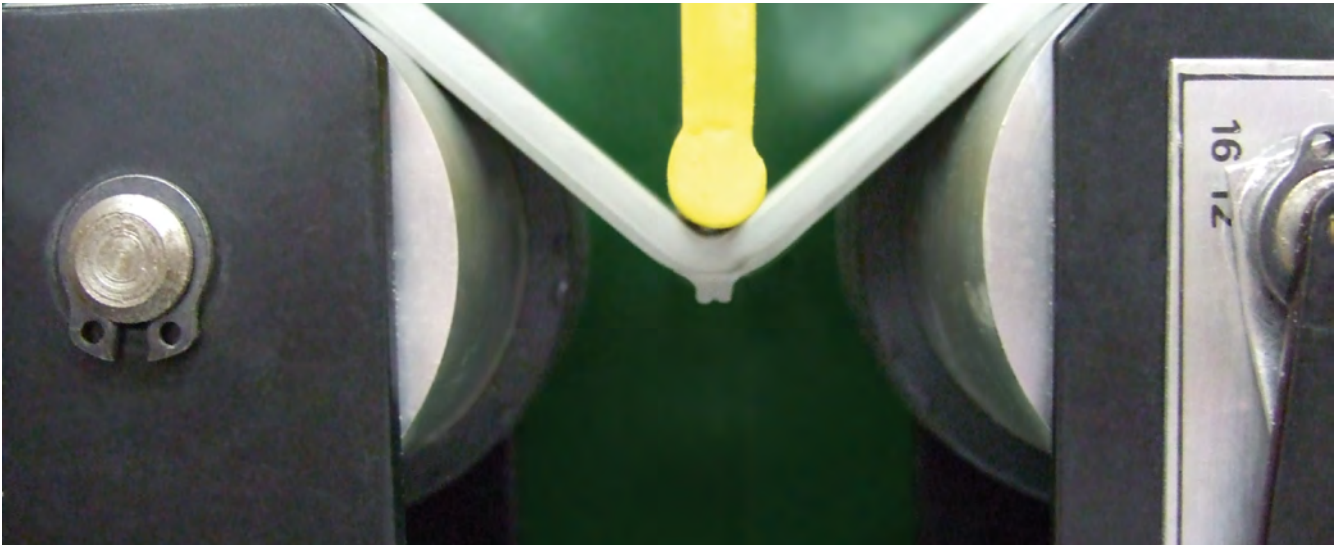
SIMONA® PP-H AlphaPlus® offers users considerably improved rigidity, in addition to increased toughness. In fact, the level of rigidity measured at 100 °C is twice as high as that of β-nucleated PP-H.

At low temperatures, in particular, SIMONA® PP-H AlphaPlus® displays higher impact resistance than standard PP-H, thus combining greater functionality with improved safety.



Notched impact strength according to Charpy method

SIMONA® PP-H AlphaPlus® – Outstanding material properties

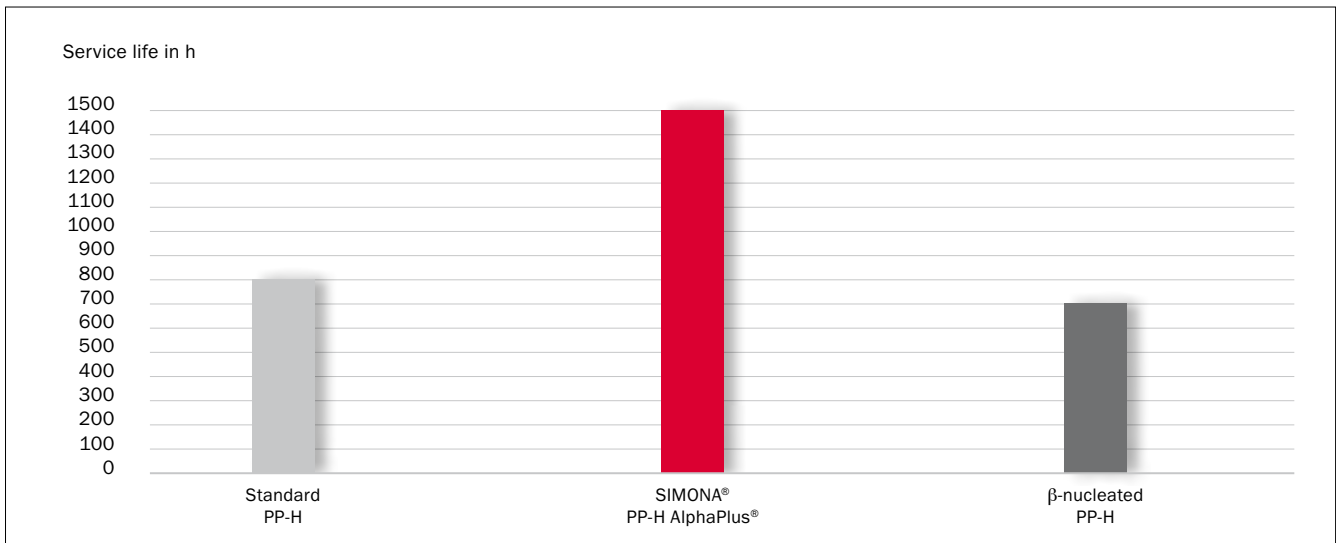


SIMONA® PP-H AlphaPlus® in bend test according to DVS 2203-5

Excellent welding properties

The various welding methods applied within the area of plastics processing can often result in changes to the morphology of a specific material. This has a significant impact on the properties of welded joints and thus also on the overall quality of plastic parts and assemblies, particularly in the case of polypropylene. A prime example is heated element butt welding, which generally produces welding beads in the joint zone. In this case, a notch is formed in the area of the weld seam, potentially causing stress concentration under

increasing mechanical loads. In turn, stress concentration in the notch root of a weld seam can induce stress cracks under tensile loading or when exposed to chemicals. The ultra-fine structure of SIMONA® PP-H AlphaPlus® is thermodynamically stable and remains intact during welding; this feature applies to a range of different welding methods. The thus resulting toughness significantly reduces the level of stress concentration in the notch root. Technological bend tests have shown a considerable increase in the bend angle achievable with this material.



Service life of various types of PP in FNCT (Full Notched Creep Test) at 80 °C and 4.0 MPa

Longer service life

The superior safety properties of SIMONA® PP-H AlphaPlus® are reflected in its higher resistance to slow crack growth – as demonstrated by means of FNCT (Full Notched Creep Test). Compared to a mildly α -nucleated standard PP-H with a useful life of between 700 and 800 hours, SIMONA® PP-H AlphaPlus® is capable of achieving a service life of more than 1500 hours. In contrast, β -nucleated PP-H is usually associated with a maximum life of 700 hours.

The superior properties associated with this material have also been confirmed by Hessel Engineering as part of tensile creep tests on sheets made of SIMONA® PP-H AlphaPlus® and joined by means of heated element butt welding. The required minimum service life of a welded joint, as defined in the certification guidelines of the DIBt (Deutsches Institut für Bautechnik Berlin) for polypropylene compounds were met by SIMONA® PP-H AlphaPlus® – with a substantial safety margin.

Improved chemical resistance and superior stress crack resistance

The fine morphology and increased toughness of SIMONA® PP-H AlphaPlus® also have a positive effect on its chemical resistance. Alongside improved welding properties, surface is much less susceptible to chemical attack. This results in a longer service life and greater operational reliability. Again, one of the key factors is the fine and highly stable crystalline structure associated with SIMONA® PP-H AlphaPlus®, which helps to reduce material-related stress. Within this context, resistance to stress-crack-inducing chemicals is high in critical regions such as weld seams or anchor points, which are subjected to internal stress or stress from external sources.



Processing versatility

SIMONA® PP-H AlphaPlus® can be processed using various methods.



Deep-drawing



Riveting



Turning



Gluing



Milling



Cold curving



Drilling



Laser cutting



Water-jet cutting



Bolting



Sawing



Cutting



Die-cutting



Welding













Cold forming



Warm bending

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SIMONA® PP-H AlphaPlus® – Product range

		SIMONA® PP-H AlphaPlus®	SIMONA® PP-H AlphaPlus®-SK (polyester-backed)
Extruded sheets (size thickness in mm)			
	2000 x 1000	0.8 - 50	2 - 8
	3000 x 1500	1.5 - 40	2 - 8
	4000 x 2000	2 - 50	-
	20000 x 1500	-	2 - 6
	Colours	grey	grey
Pressed sheets (size thickness in mm)			
	2000 x 1000	10 - 70 ^①	-
	4120 x 2010	10 - 70 ^①	-
	Colours	grey	-
Lengthways-ribbed twin-wall sheets (size thickness in mm)			
	3000 x 1000	54, 58	-
	Colours	grey	-
HKP corner elements 45° and 90° (length thickness in mm)			
	1500	54, 58	-
	3000	54, 58	-
	Colours	grey	-
Welding rods			
	Types	○▽▽♡○○	-
	Thicknesses (in mm)	3 - 7	-
	Colours	grey	-
Solid rods (length diameter in mm)			
	1000	100 - 800	-
	2000	8 - 500	-
	Colours	grey	-
Hollow rods (length diameter in mm)			
	2000	360 - 810	-
	Colours	grey	-
U-profiles (length width/high in mm)			
	5000	48 - 92 / 46 - 155	-
	Colours	grey	-
Square pipes (length width/high in mm)			
	5000	35 - 50 / 35 - 50	-
	Colours	grey	-
Tank corners (edge length wall thickness in mm)			
	150	5 - 10	-
	Colours	grey	-

The dimensions specified are standard dimensions. Other sizes, thicknesses, lengths, diameters and colours as well as glass-fibre-backed SIMONA® PP-H AlphaPlus®-GK Sheets available on request.

Please contact our sales department for further details concerning availability: sales@simona.de.

^① Pressed sheets made of SIMONA® PP-H grey are available in thicknesses from 80 to 150 mm.

○▽▽♡○○ : round, triangular TA 90, triangular TA 80, three-core, two-core, special profile oval

SIMONA® PP-H AlphaPlus® – Material specifications

Material specifications

		SIMONA® PP-H AlphaPlus®
Density, g/cm ³ , DIN EN ISO 1183		0.91
Yield stress, MPa, DIN EN ISO 527		33
Elongation at yield, %, DIN EN ISO 527		8
Tensile modulus of elasticity, MPa, DIN EN ISO 527		1700
Impact strength, kJ/m ² , DIN EN ISO 179		no break
Notched impact strength, kJ/m ² , DIN EN ISO 179		9
Shore hardness D (15 s), DIN EN ISO 868		72
Mean coefficient of linear thermal expansion, K ⁻¹ , ISO 11359-2		1.6 x 10 ⁻⁴
Thermal conductivity, W/m · K, DIN 52612		0.22
Fire behaviour, DIN 4102		B2 normal flammability (self-assessment without test certificate)
Specific surface resistance, Ohm, DIN IEC 60093		10 ¹⁴
Temperature range, °C		0 to +100
Chemical resistance		very good in contact with many acids, alkalis and solvents
Physiologically safe	BfR	✓
Food conformity	EU	✓
	FDA	✓

All specifications are deemed to be approximate values in respect of the specific material and may vary depending on the processing methods used. In general, data specified applies to average values measured on extruded sheets with a thickness of 4 mm. In the case of sheets manufactured by means of pressing, testing is generally performed on sheets with a thickness of 20 mm. Deviations from the values specified are possible if the sheets in this thickness are not available. In the case of backed sheets, all technical specifications relate to the non-backed base sheets. Information presented herein is not necessarily applicable to other products (e.g. pipes, solid rods) of the same material or products that have undergone downstream processing. Suitability of materials for a specific field of application must be assessed by the party responsible for processing or the end-user. All technical specifications presented herein are designed merely to provide assistance in terms of project planning. They do not constitute a guarantee of specific properties or qualities. For further information, please contact our Technical Service Centre at tsc@simona.de.

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