SIMONA

SIMONA® PP-DWU AlphaPlus®

Added value in chemical equipment and tank engineering

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

With SIMONA® PP-DWU AlphaPlus® companies operating within the field of chemical equipment and tank engineering have at their disposal a homopolymeric polypropylene (PP-H) that opens up a host of new opportunities for production at industrial level.

Only manufacturer of semi-finished plastics with DIBt certification for a PP-H compound

SIMONA® PP-DWU AlphaPlus® is a PP-H compound registered by SIMONA with the DIBt (Deutsches Institut für Bautechnik Berlin). As part of the official approval process, the company is required to furnish extensive documentation relating to the quality of the raw material and the actual semi-finished products manufactured therefrom. To date, SIMONA is the only manufacturer of semi-finished plastics to have been granted DIBt certification for a PP-H material. The approval procedures include far-reaching QC tests, which are conducted as part of the relevant inspection plans. What is more, the provisions stipulate external monitoring by an independent, certified testing laboratory.

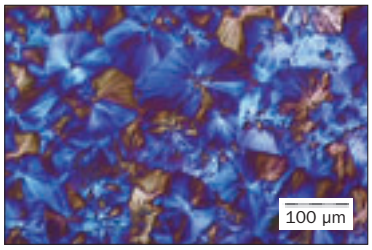
SIMONA® PP-DWU AlphaPlus® offers the following benefits:

- Finer and more stable alphacrystalline structure
- Superior notched impact strength and enhanced rigidity
- Excellent welding properties
- Longer service life
- Improved chemical resistance and superior stress crack resistance

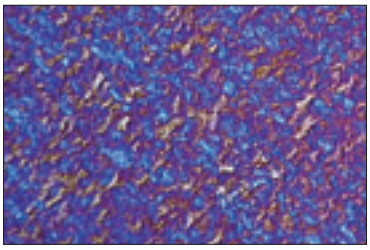
Finer and more stable alpha-crystalline structure

By adjusting key elements within the area of process engineering and incorporating special nucleating agents, SIMONA has been able to develop a PP-H with α-crystalline properties – **SIMONA® PP-DWU AlphaPlus®**.

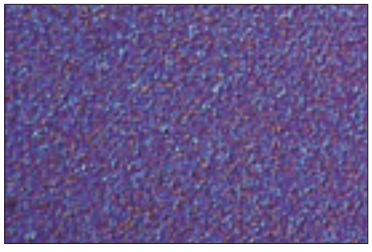
As well as delivering added value to customers, SIMONA® PP-DWU AlphaPlus® sets new standards within this segment of the market.



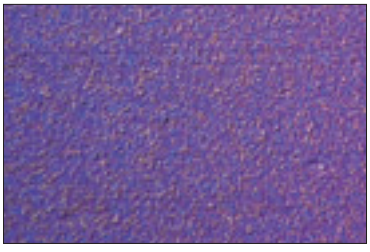
PP-H, non-nucleated



PP-H, mildly α-nucleated

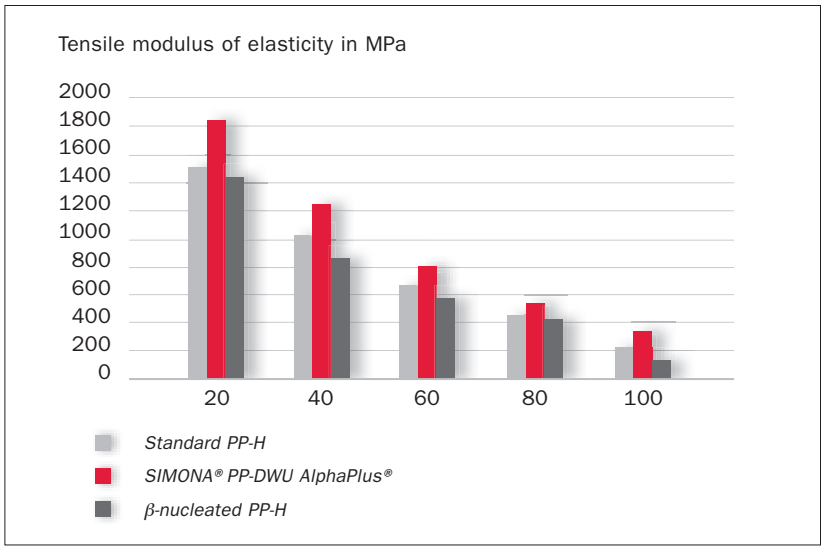


PP-H, β-nucleated

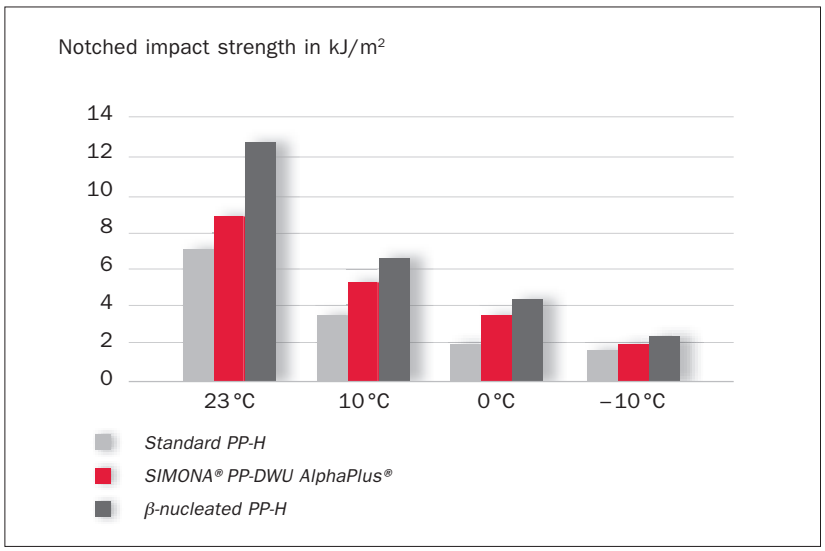


SIMONA® PP-DWU AlphaPlus®

Photographs of PP-H types taken under an optical microscope



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



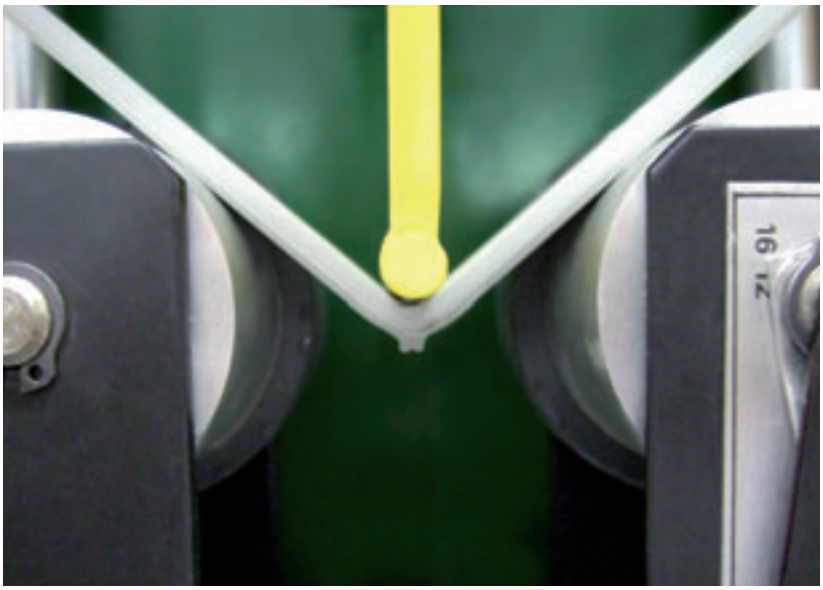
Notched impact strength according to Charpy method

Superior notched impact strength and enhanced rigidity

SIMONA® PP-DWU 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.

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

SIMONA® PP-DWU AlphaPlus® – Outstanding material properties



SIMONA® PP-DWU 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-tool 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-DWU 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.

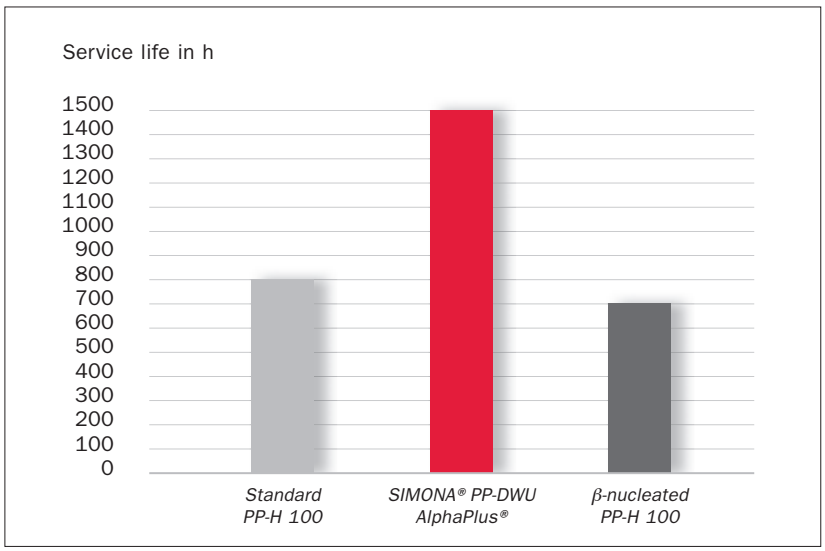
Longer service life

The superior safety properties of SIMONA® PP-DWU AlphaPlus® are reflected in its higher resistance to slow crack growth – as demonstrated by means of Full Notched Creep Test (FNCT). Compared to a mildly α-nucleated standard PP-H with a useful life of between 700 and 800 hours, SIMONA® PP-DWU 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-DWU AlphaPlus® and joined by means of heated-tool 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-DWU AlphaPlus® – with a substantial safety margin.

Improved chemical resistance and superior stress crack resistance

The fine morphology and increased toughness of SIMONA® PP-DWU 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-DWU AlphaPlus®, which helps to reduce material-related stress. Within this context, resistance to stress-crack-inducing chemicals is particularly high in critical regions such as weld seams or anchor points, which are subjected to internal stress or stress from external sources.



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

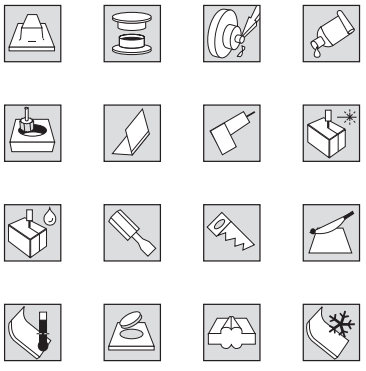
Key benefits

Your benefits at a glance

- Significantly improved welding properties
- Superior notched impact strength and enhanced rigidity
- Improved chemical resistance and superior stress crack resistance
- Longer service life
- Excellent processing properties
- Only manufacturer of semi-finished plastics with official DIBt approval for a PP-H compound (Registration Notice Z.40.25-424)
- Additional safety reserves even for critical applications
- Excellent value and highly cost-effective

Processing versatility

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



For specific details, please feel free to contact our Technical Service Centre.

TECHNICAL SUPPORT

+49 (0) 67 52 14-587
tsc@simona.de

Material specifications/Product range
SIMONA® PP-DWU AlphaPlus®

Properties	Test standard	Unit	SIMONA® PP-DWU AlphaPlus®
Mechanical properties			
Density	ISO 1183	g/cm³	0.915
Tensile test	DIN EN ISO 527		
Yield stress		MPa	33
Elongation at yield		%	8
Elongation at break		%	70
Tensile modulus of elasticity		MPa	1700
Impact bending test	DIN EN ISO 179		
Impact strength		kJ/m²	no break
Notched impact strength		kJ/m²	9
Surface hardness			
Ball indentation hardness	DIN EN ISO 2039-1	MPa	70
Shore hardness	DIN EN ISO 868	D	72
Thermal properties			
Mean coefficient of linear thermal expansion	DIN 53752	K–1	$1.6 \cdot 10^{-4}$
Thermal conductivity	DIN 52612	W/m · K	0.22
Electrical properties			
Dielectric strength	DIN IEC 60167	kV/mm	52
Surface resistivity	IEC 60093	Ohm	10^{14}
Other properties			
Fire behaviour	DIN 4102		normal flammability
Temperature range	°C		0 to +100
Physiologically safe	BfR		yes
Chemical resistance			excellent in contact with various acids, alkalis and solvents

Product range (data in mm)

		PP-DWU AlphaPlus®	PP-DWU-SK AlphaPlus® (polyester-backed)	PP-DWU-GK AlphaPlus® (glass-fibre-backed)
Extruded sheets (size/thickness)				
	2000 x 1000	0.8–50	2–8	2–8
	3000 x 1500	1.5–40	2–8	2–8
	4000 x 2000	2–50		
	20000 x 1500		2–6	2–6
	Colours	grey	grey	grey
Pressed sheets (size/thickness)				
	2000 x 1000	10–200		
	4120 x 2010	10–150		
	6200 x 2010	12–80		
	Colours	grey		
Welding rods				
	Types	○♡▽♡⬭⬭		
	Thickness	3–7		
	Colours	grey		
Solid rods (length/diameter)				
	1000	8–800		
	2000	8–250		
	Colours	grey		

SIMONA worldwide

SIMONA AG

Teichweg 16
D-55606 Kirn
Germany
Phone +49 (0) 67 52 14-0
Fax +49 (0) 67 52 14-211
mail@simona.de
www.simona.de

PRODUCTION SITES

Plant I/II
Teichweg 16
D-55606 Kirn
Germany
Phone +49 (0) 67 52 14-0
Fax +49 (0) 67 52 14-211

Plant III
Gewerbestraße 1–2
D-77975 Ringsheim
Germany
Phone +49 (0) 78 22 436-0
Fax +49 (0) 78 22 436-124

Plant V
Würdinghauser Straße 53
D-57399 Kirchhundem
Germany
Phone +49 (0) 27 23 772-0
Fax +49 (0) 27 23 772-266

SIMONA Plast-Technik
U Autodílen 23
CZ-46303 Litvínov-Chudeřín
Czech Republic

SIMONA AMERICA Inc.
64 N. Conahan Drive
Hazleton, PA 18201
USA

SIMONA ENGINEERING PLASTICS (Guangdong) Co. Ltd.
No. 368 Jinou Road
High & New Technology
Industrial Development Zone
Jiangmen, Guangdong
China 529000

SALES OFFICES

SIMONA S.A. Paris
Z.I. 1, rue du Plant Loger
F-95335 Domont Cedex
Phone +33 (0) 1 39 35 49 49
Fax +33 (0) 1 39 91 05 58
domont@simona-fr.com

SIMONA S.A. Angers
Z.I. 20, Bld. de l'Industrie
F-49000 Ecouflant
Phone +33 (0) 2 41 37 07 37
Fax +33 (0) 2 41 60 80 12
angers@simona-fr.com

SIMONA UK LIMITED
Telford Drive
Brookmead Industrial Park
GB-Stafford ST16 3ST
Phone +44 (0) 1785 222 444
Fax +44 (0) 1785 222 080
mail@simona-uk.com

SIMONA AG SCHWEIZ
Industriezone
Bäumlimattstraße 16
CH-4313 Möhlin
Phone +41 (0) 61 855 90 70
Fax +41 (0) 61 855 90 75
mail@simona-ch.com

SIMONA S.r.l. ITALIA
Via Padana
Superiore 19/B
I-20090 Vimodrone (MI)
Phone +39 02 25 08 51
Fax +39 02 25 08 520
mail@simona-it.com

SIMONA IBERICA SEMIELABORADOS S.L.
Doctor Josep Castells, 26–30
Polígono Industrial Fonollar
E-08830 Sant Boi de Llobregat
Phone +34 93 635 41 03
Fax +34 93 630 88 90
mail@simona-es.com
www.simona-es.com

SIMONA-PLASTICS CZ, s.r.o.
Zděbradská ul. 70
CZ-25101 Říčany-Jažlovice
Phone +420 323 63 78 3-7/-8/-9
Fax +420 323 63 78 48
mail@simona-cz.com
www.simona-cz.com

SIMONA POLSKA Sp. z o.o.
ul. H. Kamieńskiego 201–219
PL-51-126 Wrocław
Phone +48 (0) 71 352 80 20
Fax +48 (0) 71 352 81 40
mail@simona-pl.com
www.simona-pl.com

SIMONA FAR EAST LIMITED
Room 501, 5/F
CCT Telecom Building
11 Wo Shing Street
Fo Tan
Hongkong
Phone +852 29 47 01 93
Fax +852 29 47 01 98
sales@simona.com.hk

SIMONA ENGINEERING PLASTICS TRADING (Shanghai) Co. Ltd.
Room C, 19/F, Block A
Jia Fa Mansion
129 Da Tian Road, Jing An District
Shanghai
China 200041
Phone +86 21 6267 0881
Fax +86 21 6267 0885
shanghai@simona.com.cn

SIMONA AMERICA Inc.
64 N. Conahan Drive
Hazleton, PA 18201
USA
Phone +1 866 501 2992
Fax +1 800 522 4857
mail@simona-america.com
www.simona-america.com

Printed on Allegro demi-matt by m-real.

K+D 05/2009 · 500 · KD · GB