

lyondellbasell

Softell Feel the difference



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Innovation – Value – Efficiency – Sustainability

Softell polypropylene (PP) compounds and resins are Lyondellbasell's new-generation advanced polyolefins which offer a unique combination of performance and processing characteristics and are designed for use in demanding technical applications such as automotive parts.

With outstanding softness and aesthetic characteristics combined with good processing and flexibility, *Softell* PP compounds can help to create cost-effective and highly sophisticated design concepts. The materials do not contain softeners, are fully compatible with other polyolefins, and offer significant tactile properties with lower system costs compared to existing material combinations.



Tactile properties

The *Softell* product family can provide a wide range of tactile and visual options without the use of textile and surface coverings required by traditional solutions. Customers using *Softell* PP compounds can produce sophisticated products with superior tactile properties and surfaces with a matt finish. From monomaterial instrument panel parts to over-molded interior trim and parts, the resins enable the creation of levels of comfort and design previously available only in high-end vehicles. *Softell* compounds can be used in applications such as furniture, hand-held tools, laptop casings; in fact any consumer product where grip and surface warmth are valued.



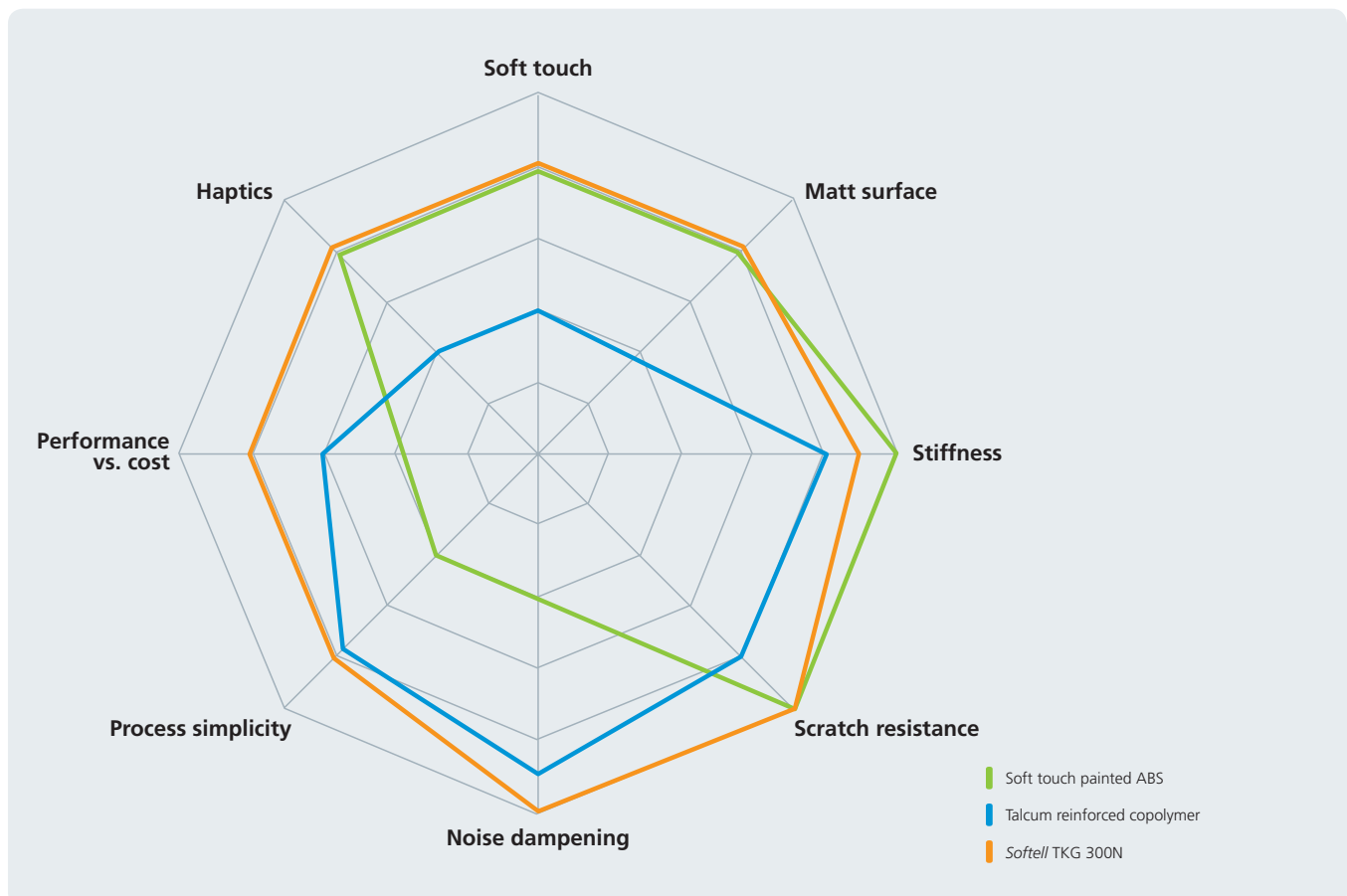
Costs and energy savings

The *Softell* product family combines high performance attributes with the processing characteristics of polyolefins. Due to an outstanding property profile, the products enable the production of excellent surface aesthetics and high-quality finished part properties using only one injection molding step. As additional processing steps are not required with *Softell* resins; high part quality can be achieved while saving on production costs and energy consumption.



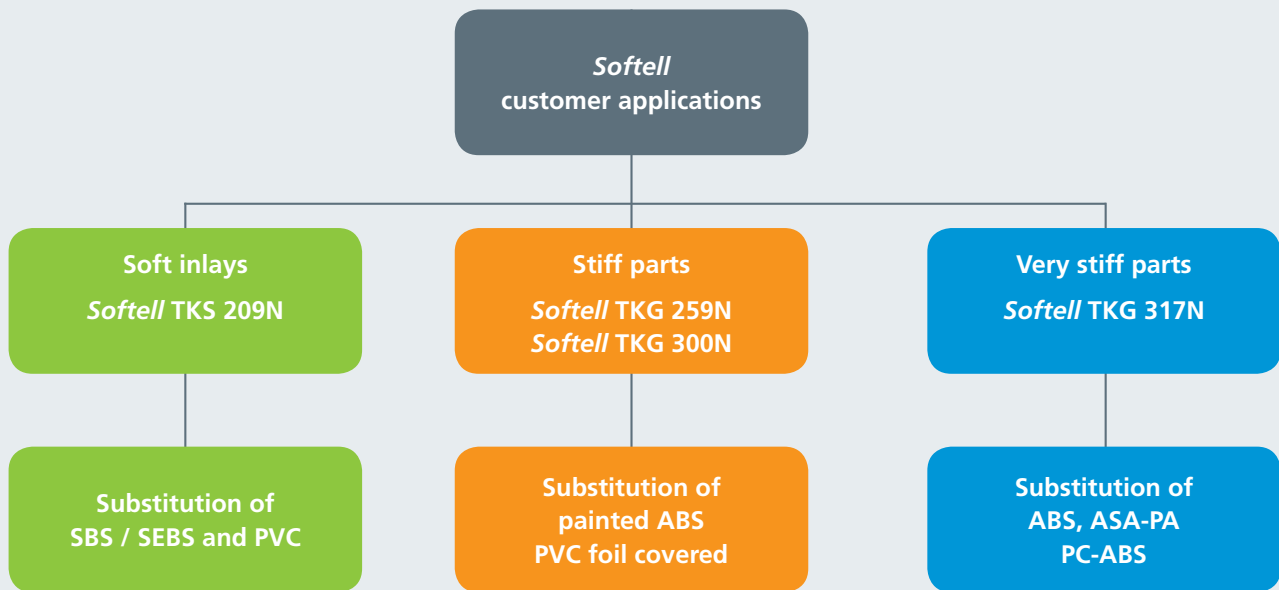
Softell replacing engineering plastics and soft paint coated polymers for use in demanding customer applications

Surface	Properties	Performance
Pleasant haptics	Material stiffness from 50 to 4000 MPa modulus is available	One material – reducing process and logistics complexity
Soft touch	Excellent low-temperature impact	Very good noise dampening
Matt surface	Good flowability	Low-vibration characteristics
Excellent scratch resistance	Halogen and plasticizer free	Material can be laser scored and used, e.g. in seamless air bags
Very good chemical resistance		Finished parts can be produced via conventional injection molding
		Recycling benefits

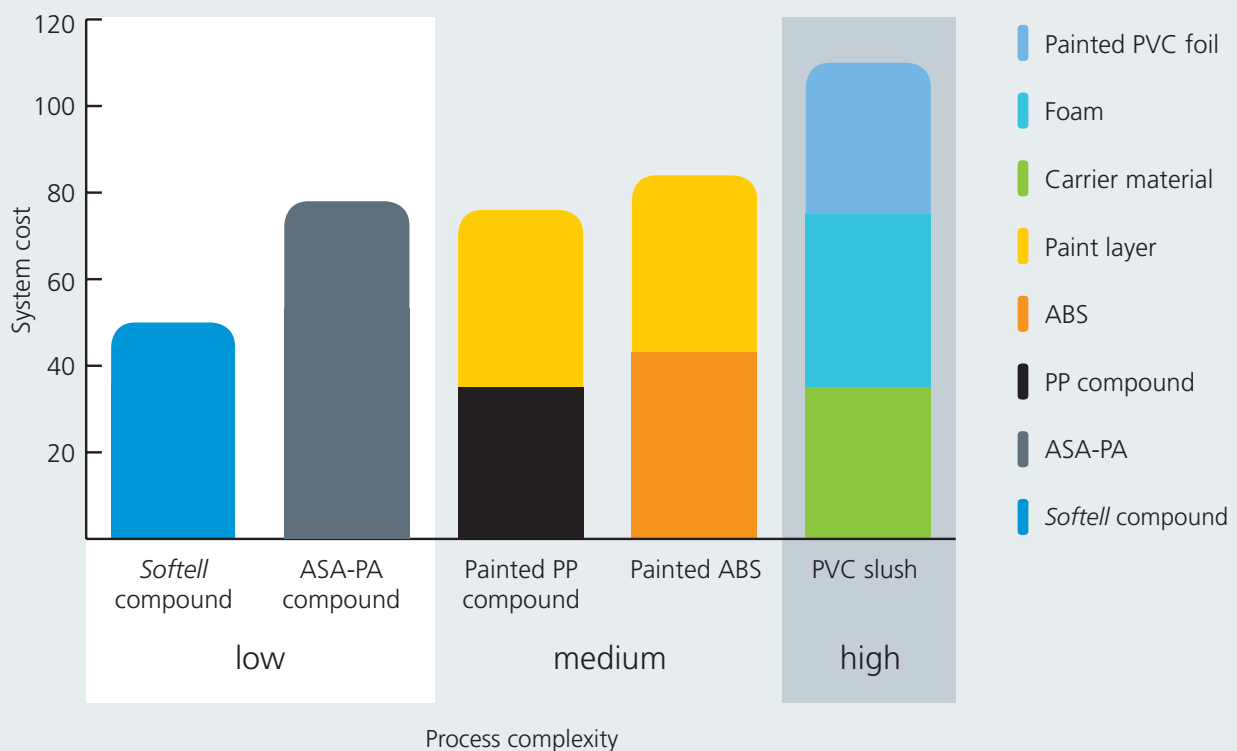


Application areas of *Softell* products

Softell resins – Typical customer applications



Cost and Complexity of *Softell* Compounds vs. Conventional Systems



Softell product portfolio

				Softell TKS 209N	Softell TKG 259N	Softell TKG 300N	Softell TKG 317N
Glass fiber content				0	20	25	25
Property	SC	Norm	Unit				
MFR 230/2.16	y	ISO 1133	g/10'	6	7	7	7
Tensile stress at yield	n	ISO 527/1+2	MPa	4.4	30.8	36.2	63.0
Tensile stress at break	n	ISO 527/1+2	MPa	9.1	27.7	35.8	60.6
Tensile strain at yield	n	ISO 527/1+2	%	18.6	17.5	11.1	3.0
Tensile strain at break	n	ISO 527/1+2	%	>500	22	13	5
E-Modulus	n	ISO 178	MPa	80	1700	2500	4000
Charpy notched impact strength at 23°C	n	ISO 179/1eA	kJ/m ²	NB	40	30	12
Charpy notched impact strength at -30°C	n	ISO 179/1eA	kJ/m ²	NB	11	7	5.5
HDT B	n	ISO 75/1+2	°C	–	126	130	147
Shrinkage on plaques (longitudinal/transversal)	n	int. Meth.	%	0.48/0.63	0.15/0.61	0.13/0.68	0.18/0.90
Shore hardness D (3s/15s)	n	ISO 868		77/(Shore A)	56/52	58/55	71/69
Scratch resistance 10 N VW K-85 after 7 days	n	VW PV 3952	dL *	-0.3	0.1	0.1	0.2

*change in brightness versus original surface



Contacts

Without exception, any potential use of *Softell* products has to be discussed with the relevant Application Development and Business contacts in advance.

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My remarks

Before using a LyondellBasell product, customers and other users should make their own independent determination that the product is suitable for the intended use. They should also ensure that they can use the LyondellBasell product safely and legally (Material Safety Data Sheets are available from LyondellBasell at www.lyondellbasell.com). This document does not constitute a warranty, express or implied, including a warranty of merchantability or fitness for a particular purpose. No one is authorized to make such warranties or assume any liabilities on behalf of LyondellBasell except in writing signed by an authorized LyondellBasell employee. Unless otherwise agreed in writing, the exclusive remedy for all claims is replacement of the product or refund of the purchase price at LyondellBasell's option, and in no event shall LyondellBasell be liable for special, consequential, punitive, or exemplary damages.

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