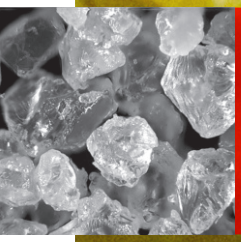


Structuring Agents

Polymer powders for surface modification

Deuteron®

ADDITIVES TO YOUR SUCCESS

Structuring Agents by Deuteron

Creating haptic effects the easy way

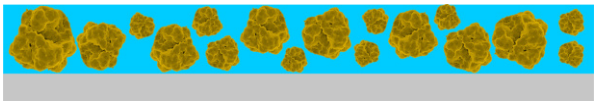
Today's product designs shift from traditional coatings with a plastic-like touch to more pleasant haptics. New surface designs range from smooth, velvet-like films over paper-like dry touch to rough surfaces with significant texture. For the creation of such haptic films specific additives are needed. Deuteron offers a broad range of specialized products to create a variety of surface effects and textures. Our Deuteron ST product range is specifically designed to modify the haptics and create texturing effects. A broad selection of different particle sizes to choose from helps formulators to design a wide variety of surface effects.

The choice of a texturing additive is influenced by a variety of different factors: (a) the additive's particle size distribution; (b) the coating's dry film thickness; (c) desired haptic impression and (d) optical appearance. The final effect is mainly influenced by the relation between particle size and film thickness and the overall film shrinkage (solid content). Fine particles lead to smoother films and more uniform matting whereas coarse particles lead to rough textures with a glossy wet appearance.

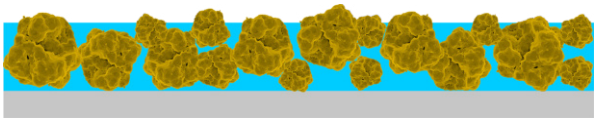
The overall matting efficiency of texturing additives differs from dedicated matting additives. However, it is possible to achieve significant matting effects by using high addition levels of texturing particles. This concept is addressed in detail in our **"Coarse Matting"** concept flyer.

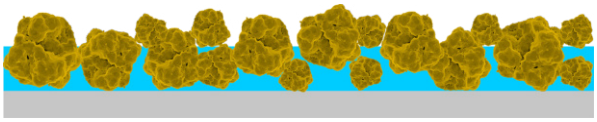
Deuteron's texturing additives are used universally in all kinds of liquid coating systems. The wide selection of different particle sizes enables coating formulators to create a lot of different texturing effects in many different systems and add functional and protective properties.

The most important selection criteria is the particle size distribution. Particle size and number significantly influence the final effect. Large particles lead to rough and uneven films. When comparing similar addition levels, the coarser grades contain a smaller number of particles. This leads to a texture with glossy parts between particles; creating an anti-slip effect with a wet-look appearance. Fine particles lead to smooth and protective films with a uniform, matte appearance. Combinations of different particle sizes lead to unique effects with limitless possibilities.

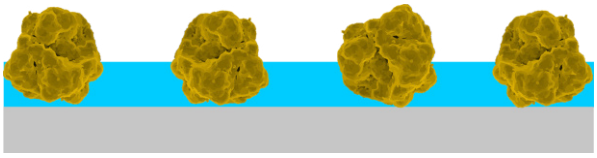


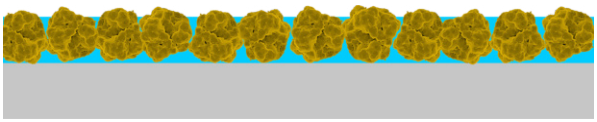
No texturing effects. Particle size is too low and/or no film shrinkage lead to complete levelling of the film.

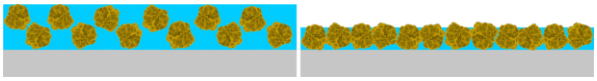




Similar particle sizes and addition levels can lead to significantly different texture effects depending on the applied film thickness.







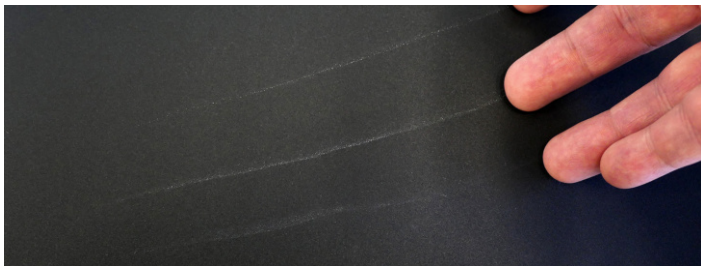
The texturing effect is influenced by particle size distribution in relation to film thickness as well as volume loss and dosage.

Key influencing factors are:
solid content, particle size, dry film thickness and addition level!

Applications

Texturing additives serve a broad range of applications. Ranging from fine, matte surfaces –similar to traditional matting but with different haptics and higher mechanical resistivity – to coarse, extremely rough anti-slip films. The application profile includes decorative effects, haptic specialities as well as functional applications.

Deuteron ST-products are highly versatile materials and are being used in almost all coating and ink applications.



Deuteron offers a broad portfolio of different products based on our own polymethylurea (PMU) chemistry. Coarse grades are based on thermoplastic materials such as polyethylene (PE), polyamide (PA) and polyester.
Texturing additives based on PMU outperform the thermoplastic materials in terms of hardness and resistivity. Scratch marks are removable and polishing is almost impossible. Deuteron's PMU particles are a perfect match for high durability applications such as floor coatings.

Anti-Slip and imitated surface textures

Print

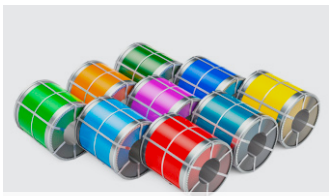
Combination with effect pigments

OPV

Ligth diffusing effects

Consumer electronics

Ligth diffusing effects



Can & Coil Coatings

Automotive

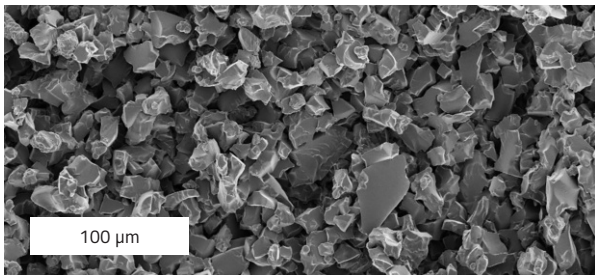
Comparison of some types of texturing agents for surfaces.

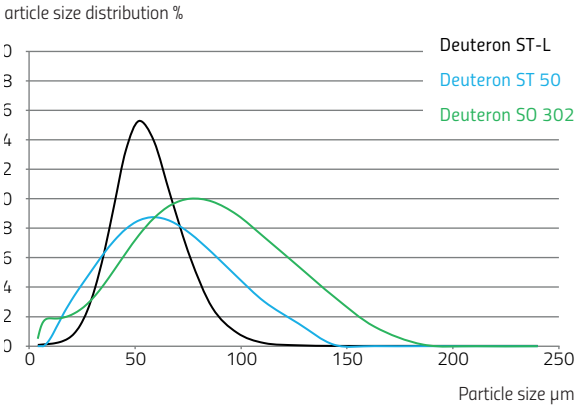
	Polyamides	Polyacylates	Polyurethanes	Polyesters	PE or PP	Waxes	PMU
Cost level	↑	↑	→	↓	↓	↘	↘
Temperature stability	↑	↓	→	↑	↓	↓	↑
Mechanically stability	↑	↓	↑	↑	→	↓	↑
Chemically stability	↑	↓	→	↑	↑	→	↑
Re-coatabiliy	↗	↗	↗	↗	↓	↓	↗
Matting Effect	→	↓	↓	↓	↓	→	↓

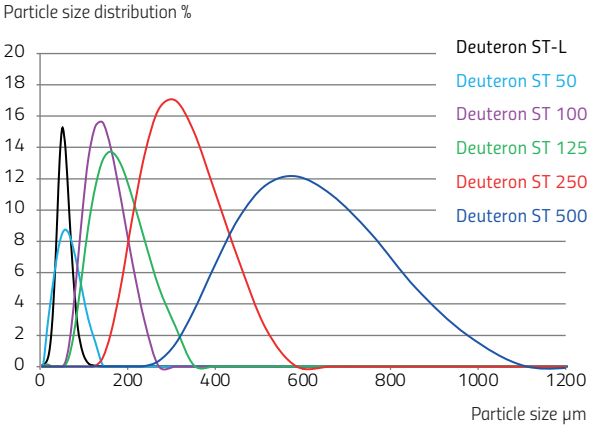
Types available by Deuteron

Elastomers

Deuteron SO 302 is a liquid dispersion designed for water-based systems. Based on soft polyester particles **Deuteron SO 302** is similar to our soft-touch additives but with a larger particle size distribution. The coarse elastic particles create a uniform texture effect with a warm and rubbery appearance. They can be crosslinked with isocyanates, which leads to outstanding mechanical and chemical resistivity



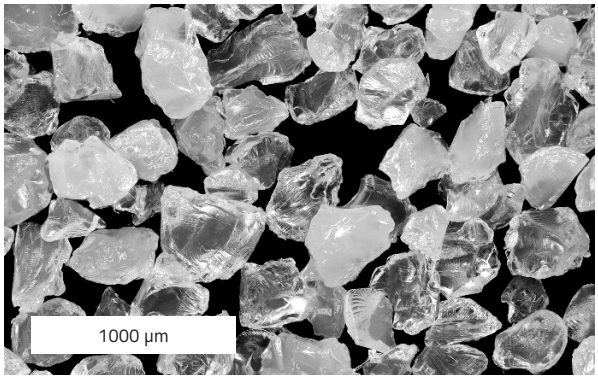




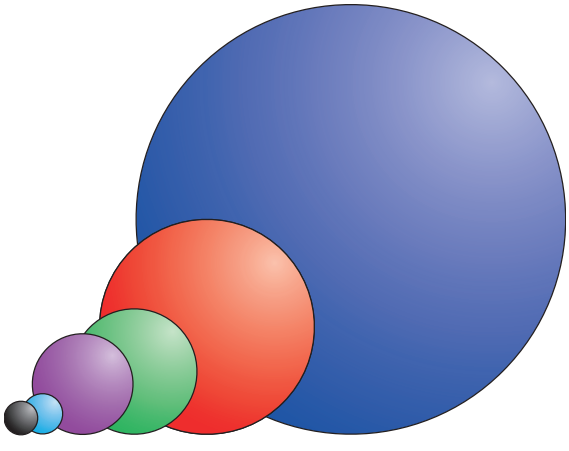
Thermoplastic Deuteron ST-grades

Deuteron offers a range of texturing additives based on various thermoplastics to create very coarse textures. The products **Deuteron ST50** to **ST500** are coarse grades based on polyethylene, polyamide and polyester with a melting range between 130°C and 160°C. The products are used in applications with high film thickness or when very rough textures are needed. Anti-slip is a major application for these coarse products. Decorative effects like frosted glass are also possible.

Our thermoplastic texturing additives are highly transparent ground particles. They are not brittle and show a high melt flow viscosity – helps to maintain particle shape even in high temperature applications.



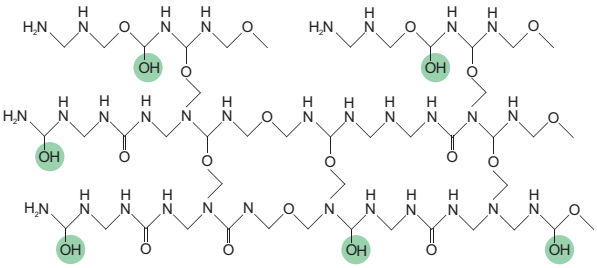
Comparison of proportions



Deuteron SF

Deuteron SF 505 and **Deuteron SF 707** are the finest particles in our texturing additive portfolio. Both products are finely ground versions of our Deuteron ST product range. With particle sizes within the range of our matting additives (Pergopak M3 and Deuteron MK-F) both products barely impart any rough texturing effect. A texturing effect is still achievable in thin film applications such as OPVs.
With their **smooth and solid particles** both products are also used to impart surface protection and slip properties. **For details please see our technical leaflet "PTFE Alternatives"**.

Similar to our matting additives, Deuteron SF 505 and SF 707 are based on our well-established PMU chemistry.

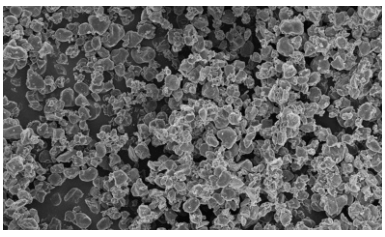


Duromere ST grades

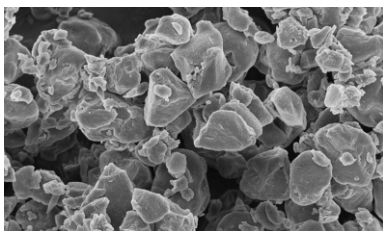
Deuteron's PMU-based ST grades are fine to coarse particles free of waxes or silicones. Compared to other texturing additives based on polyamide, acrylic or polyurethane our PMU-based materials are more resistant against mechanical stress, significantly easier to disperse and therefore more economic.

PMU based additives are highly temperature resistant and can even withstand temperatures above 200°C. Due to their comparably high hardness they effectively increase the coatings hardness and can significantly reduce the coefficient of friction. With an refractive index close to most coating resins PMU remains highly transparent and does not interfere with the appearance of pigmented systems or the clarity of clear coats.

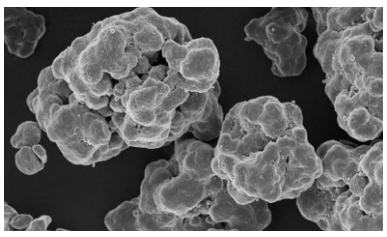
Fine ground SF powder

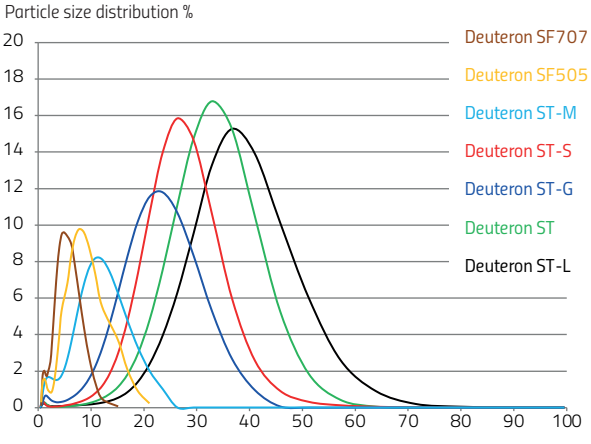


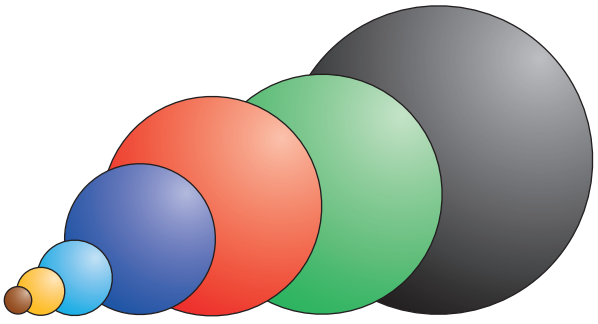
Particle structure of ground ST types



Particle structure or classified ST types







Comparison of proportions

Structuring Agents by Deuteron

Haptic, visual and functional surface modification

Properties at a glance

Duromerics (PMUs)

- Available in 5 different particle sizes (ST-M to ST-L)
- Two very fine SF-grades for thin films and slip effects
- Temperature resistance up to 200°C, short term above 300°C
- High mechanical resistance (scratches and polishing)
- Low impact on viscosity
- Crosslinking via free hydroxylgroups
- Biodegradable
- No risk of dust explosion
- Suitable for food contact applications

Thermoplastics

- 5 Available in 5 different particle sizes (coarser than the duromeric grades)
- Suitable for extreme roughness
- Based on Polyethylene, Polyamide and Polyester
- High stability compared to wax-based additives
- High melt flow viscosity – suitable for oven cured systems
- Good mechanical resistance
- Low impact on viscosity

Technical Data

	Particle sizes µm		Material	Type	Active content %	Temperature stability / Melting range (*) °C	Delivery form
	d50	d90					
DEUTERON SF 707	4	8	PMU	Duromer	100	> 200 °C, short-time up to over 300 °C	Powder
DEUTERON SF 505	7	13					
DEUTERON ST-M	11	19					
DEUTERON ST-G	22	34					
DEUTERON ST-S	32	46					
DEUTERON ST	35	53					
DEUTERON ST-L	45	72					
DEUTERON ST 50	60	100	HDPE	Thermoplast		126-130*	
DEUTERON ST 100	150	220					
DEUTERON ST 125	170	260	Polyamid			150-160*	
DEUTERON ST 250	320	460	Polyester				
DEUTERON ST 500	640	1000					
DEUTERON SO 302	30	60		Elastomer	45	160*	Dispersion

Deuteron®
ADDITIVES TO YOUR SUCCESS

Deuteron: First-class products for the coating industry

Deuteron successfully develops and sells innovative additives since 1977. Our product range consists of matting agents, anti-static additives, texturing additives, thickeners and UV initiators. In the course of our company history we have become an important partner of the national and international paint, lacquer and coating industry with sales agencies around the globe.

Visit us on the Internet

Our documents such as product datasheets, safety datasheets, regulatory information and brochures are available in the download area of our website without registration.

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