

ORGASOL® / RILSAN®

Coatings Additives



Coatings Applications

ORGASOL® and RILSAN® polyamide powders with their unique combination of properties bring the desired performances to either water-based, solvent-based, UV/EB or powder formulations, on a wide variety of substrates.

COIL COATING

- Texture appearance
- Abrasion/scratch resistance
- Exterior durability



CAN COATING

- Abrasion/scratch resistance
- Flexibility
- Gloss control



INDUSTRIAL COATINGS (WOOD/PLASTIC/METAL/RUBBER/GLASS)

- Abrasion/scratch resistance
- Gloss control with no viscosity increase
- Slip and lubricity



FLOORING

- Gloss control with no viscosity increase
- Abrasion/scratch resistance
- Cleanability and anti-slippery



GRAPHIC ARTS/INKS/OPV

- Gloss control with no viscosity increase or burnishing
- Scratch/rub resistance
- Slip and lubricity



Ultra-Fine Powders

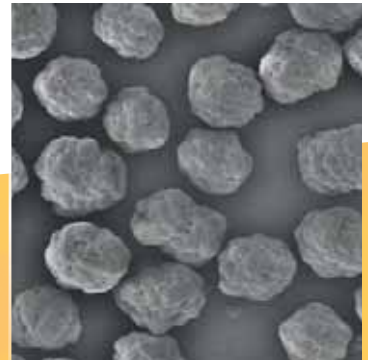
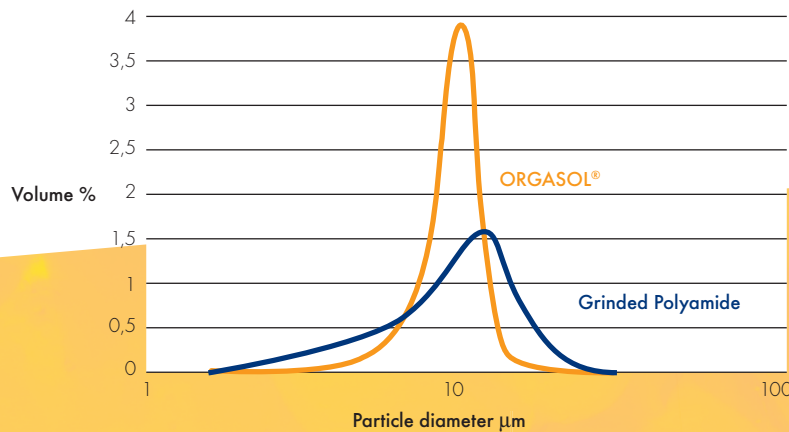
ORGASOL[®] is a range of high performance ultra-fine polyamide powders used as additives in paints, varnishes, inks and technical compounds to improve the properties of highly demanding coatings applications.

Key features of ORGASOL[®] powders

- Polymers and copolymers of lauryllactame and/or caprolactame (PA12, PA6 and PA6/12)
- Direct polymerization process
- Micro-porous spherical beads with unique morphology
- Very narrow particle size distribution
- Different particle sizes (from 5 to 60 microns), specific surface areas and melting points

Particle size distribution

(coulter-multisizer III granulometer)



ORGASOL[®] 2001 EXD NAT1

The structure, shape and properties of ORGASOL[®] contrast with other powders made by grinding or precipitation. ORGASOL[®] also stand out from other additives like polyethylene-polypropylene PTFE waxes and acrylics powders by their higher melting point, outstanding chemical resistance and stability in formulations.

Properties of ORGASOL[®] range in coatings applications

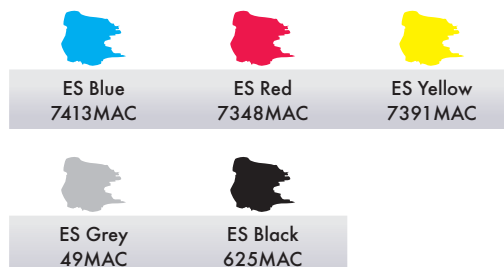
Thanks to their particular morphology and narrow particle size distribution, ORGASOL[®] ultra-fine polyamide powders offer unique properties for coatings applications:

- High abrasion / mar resistance
- High scratch resistance
- Matting and gloss control
- Non thixotropic agent / viscosity control
- Unique surface texturing effect
- Soft touch
- Anti-blocking (reduction of coefficient of friction)
- Easy dispersion in all kind of liquid paints

RILSAN® is a range of high performance fine polyamide powders manufactured from 100% renewable resource (castor oil) and used as additives in industrial coatings to improve properties and impart texture.

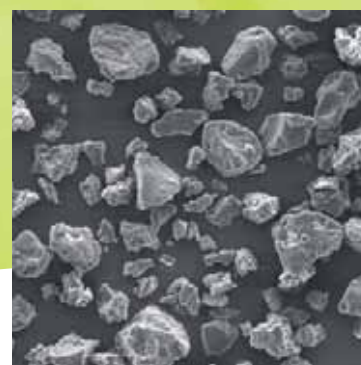
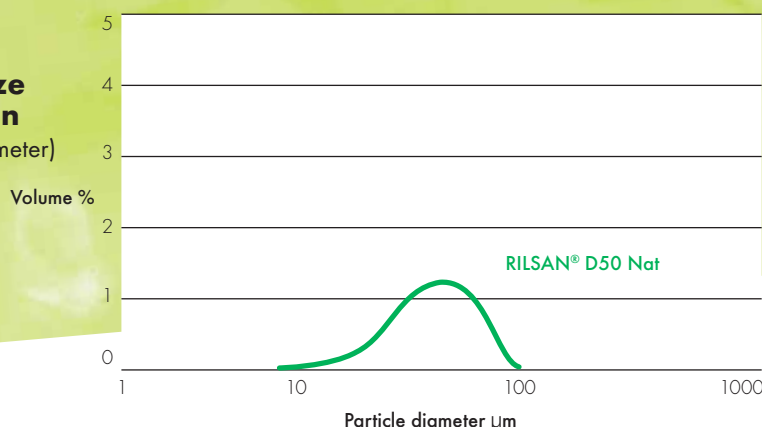
Key features of RILSAN® powders

- Polyamide 11 (high molecular weight thermoplastic polymer)
- Proprietary process from a renewable raw material
- Different particle size from 20 to 100 µm
- Low density (avoiding settlement)
- Mass-colored grades for multicolored effect and opacity



Particle size distribution

(laser granulometer)



RILSAN® D50 NAT

The morphology of the particles is that of a powder obtained through grinding. The various grades in the range have the same chemical nature but differ in particle size distribution based on grinding conditions. Coatings using RILSAN® powders exhibit a textured surface with a matt finish without affecting the other physical properties.

Properties of RILSAN® range in coatings applications

Thanks to their specific manufacturing process, RILSAN® fine polyamide 11 powders offer distinctive properties for coatings applications:

- Improved scratch and abrasion resistance
- Textured surface effects based on variety of particle size and mass-coloration
- Matting and gloss control
- Outstanding chemical resistance
- Low moisture pick-up
- A unique touch
- Low density
- Easy dispersion in all kind of liquid paints



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Fine powders – Coatings additives

TYPICAL PROPERTIES OF ORGASOL® POWDERS

ORGASOL® BY ARKEMA	Polyamide	Average particle size µm	Specific surface area m ² /g	Melting point °C	Comments
2001 UD NAT1	12	5	9	177	
2001 UD NAT2	12	5	9	177	Food contact approved
2001 EXD NAT1	12	10	4	177	
2002 EXD NAT1	12	10	1.5	177	Food contact approved
2002 D NAT1	12	20	1	177	
2002 ES3 NAT3	12	30	1	177	
2002 ES4 NAT3	12	40	1	177	
2002 ES5 NAT3	12	50	1	177	
2002 ES6 NAT3	12	60	1	177	
1002 D NAT1	6	20	2	217	
1002 ES5 NAT1	6	50	<1	217	
3501 EXD NAT1	6/12	10	20	143	
3502 D NAT1	6/12	20	6	143	

Particle size is measured using a Coulter-Multisizer III granulometer

TYPICAL PROPERTIES OF RILSAN® POWDERS

RILSAN® BY ARKEMA	Polyamide	Average particle size µm	Specific surface area m ² /g	Melting point °C	Comments
D20 WHITE	11	20-24	< 1	186	mass-colored
D30 NAT	11	21-27	< 1	186	
D40 NAT	11	27-31	< 1	186	
D40 WHITE	11	26-33	< 1	186	mass-colored
D50 NAT	11	40-46	< 1	186	
D60 NAT	11	43-55	< 1	186	
D80 NAT	11	95-105	< 1	186	
ES MAC COLOR	11	28-36	< 1	186	several colors

Particle size is measured using a laser granulometer



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For water-based varnishes

Water-based varnishes are widely used in the paint industry. Many segments require specific formulations adapted to the different substrates: wood, plastic, metal, glass.

Also, with the public awareness and the industry showing high responsibility towards the environment, water-based formulations are now progressively replacing existing solvent-based ones.

ORGASOL® polyamide powders are used as high value additives in varnishes for many specific applications, where aesthetics and performance are critical requirements.

Using ORGASOL® provides the following properties:

- high **scratch and abrasion resistance**
- **gloss level adjustment**
- improvement of the **coatings flexibility**
- no impact on its recoat ability.

ORGASOL® is easily dispersed in polyurethane, epoxy or acrylic formulations used on furniture and appliance surfaces, and can be used in solvent based, water based, or 100% solid UV curable formulations, with no impact on the viscosity and no burnishing formation.

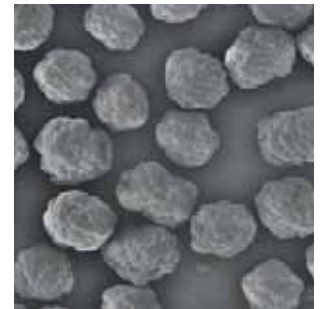
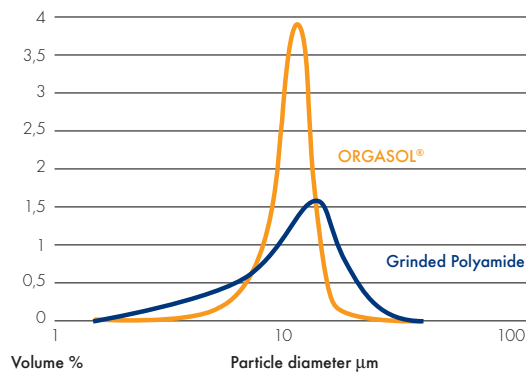


Visual effect of a typical PUD varnish containing ORGASOL® 3501 EXD NAT1 (left) vs. the uncoated glossy black ABS panel (right)

ADDED VALUE OF ORGASOL®

Because the particle size distribution of ORGASOL® is thinner and accurately controlled by the manufacturing process, it provides a **more regular** and **softer texture** compared with existing paint additives.

Particle size distribution
(apparatus: Coulter®
Multisizer III)



ORGASOL® 2001 EXD NAT1

TYPICAL FORMULATIONS

Example of acrylic system

	weights (g)
Orgasol® pre-dispersion:	
Disperbyk 190	32.20
Orgasol® powder	32.20
Water	33.90
Lopon E81 (10% IPA)	1.70
total	100.00
Craymul 2510	836.00
Orgasol® pre-dispersion	59.00
AMP 90	2.00
Water	58.00
Rima Flash JDO	5.00
Mix Viscoatex 46 / Rheotech 2000 (50% water)	40.00
total	1000.00

Example of polyurethane system

	weights (g)
Orgasol® pre-dispersion:	
Disperbyk 190	32.10
Orgasol® powder	32.30
Water	33.90
Lopon E81 (10% IPA)	1.70
total	100.00
PUD resin (no co-solvent nor ethoxylated alkylphenol)	870.60
Orgasol® pre-dispersion	47.40
AMP 90	2.00
Water	35.00
Rima Flash JDO	5.00
Mix Viscoatex 46 / Rheotech 2000 (50% water)	40.00
total	1000.00

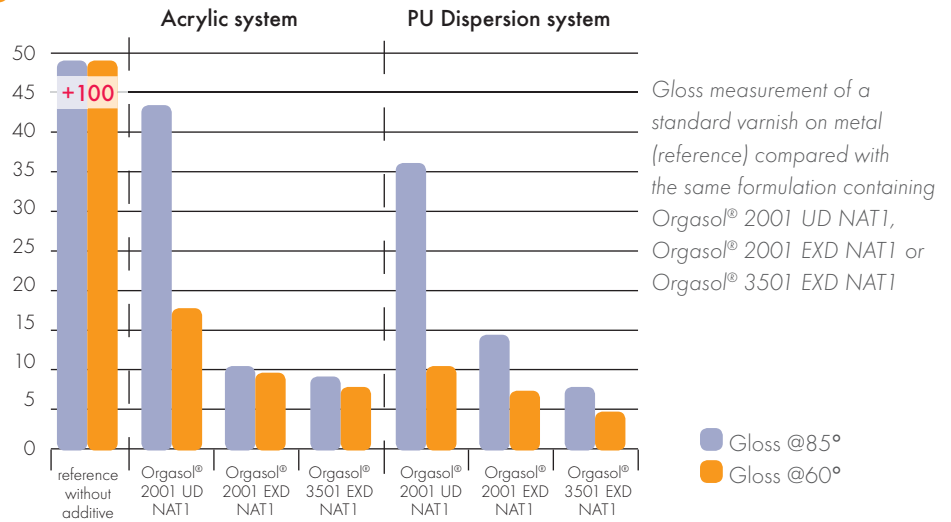
Procedure

- incorporation under stirring in the exact order of table
- the Orgasol® pre-dispersion is stirred at 1000 rpm for 10 mn
- the final system is dispersed at 1700 rpm for 10 mn

- varnishes dry content (without additives): 40% for the acrylic system, 32% for the PUD system
- Orgasol® content vs. dry resin: 5% for both systems

SUMMARY OF PROPERTIES

ORGASOL[®], with its spherical shape and uniform particle size, is the best solution to achieve coatings with a **soft and silky texture** and an **even satin gloss**, while not increasing viscosity or creating defaults such as burnishing. Using ORGASOL[®] has no impact on varnish **transparency** and enables **good mar resistance**. It can also be used to improve **scratch resistance**.



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For coil coating

Coil coating is a high performance technique of continuous application of an organic coating on metal strip (aluminum or steel) before the material gets its final shape.

ORGASOL® range of **high performance polyamide powders** is used as **high value additives** in formulations (for example rolling shutters, roofing, garage doors) to provide the following properties:

- nice and regular **texture**
- **high abrasion** and **scratch resistance**
- improvement of the **flexibility** of the coatings with no impact on recoatability

Performance	Easy application	Hardness	Flexibility	Scratch-resistant	Stain-resistant	Solvent-resistant	Chemical-resistant	Corrosion-resistant	Dirt-resistant	Exterior durability	Cost
Standard polyester	1	2	2	3	2	2	2	2	2	3	1
High durability polyester	1	2	2	3	2	2	2	2	2	1	3
Silicon polyester	1	2	4	3	2	2	2	2	3	2	3
Polyurethane	1	2	1	2	2	2	2	2	2	2	2
Polyamide polyurethane	1	1	1	1	1	2	2	2	2	1	4
PVDF	1	2	1	1	1	1	1	2	2	1	5
Plastisol	1	4	1	1	4	4	1	1	4	3	4
Epoxy	2	1	4	2	1	1	1	1	2	5	2

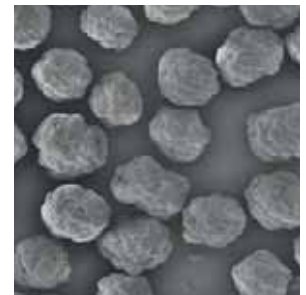
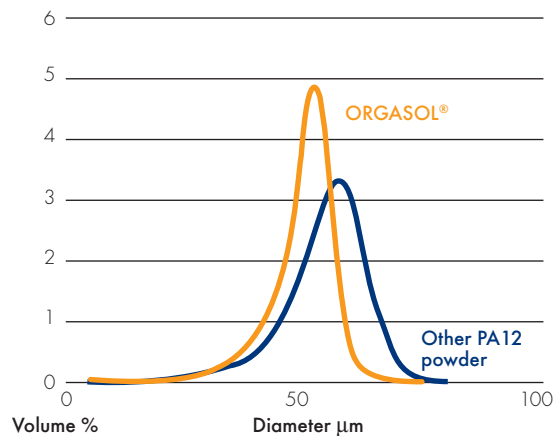
Relative properties of the main types of coil coating

Note: 1 to 5 rating runs in descending order of performance and (in the case of cost) economy. (source ECCA)

ADDED VALUE OF ORGASOL®

Other polyamide 12 powders exist on the market and are produced through different processes. Because the particle size distribution of ORGASOL® is thinner and accurately controlled by the manufacturing process, it provides a **more regular and softer texture**.

Particle size distribution
(apparatus : Coulter®
Multisizer III)



ORGASOL® 2002 ES5 NAT3

TYPICAL FORMULATIONS

ORGASOL® powders are easily dispersed as an additive in the most common types of formulations such as:

• Polyurethane systems:

Polyester resins cured by blocked polyisocyanates

• Polyester systems:

Polyester resins cured by melamine

ORGASOL® powders are generally added at the end of the process at a level of 3 to 5% w/w in the coil coating systems in order to reach the desired performances.

Components	Parts (w/w)
Synolac 9605 S65	18.9
Butyl Diglycol	0.6
Solvesso 150	0.6
Disperbyk 161	0.7
Kronos 2310	28.8
Aerosil R972	0.3
<i>Dispersion 40' at 3500 rpm</i>	
Synolac 9605 S65	28.6
Butyl Diglycol	0.9
Solvesso 150	0.9
Disperbyk 161	0.1
<i>Dispersion 15' at 2500 rpm</i>	
Cymel 3030 LF	5.5
PTSA (12,5% butanol)	0.9
Butyl Diglycol	6.5
Solvesso 150	6.5
Crayallac Flow 200	0.2
	100

Example of Polyester/Melamine formulation
Curing conditions:
42 sec; Peak Metal Temperature: 254°C

Other typical formulations are available.

SUMMARY OF PROPERTIES

	Coatings Additives				
	Orgasol®	Polyethylene/ Polypropylene	PMMA	Silica	PTFE - PE
Abrasion resistance	+++	-	-	-	+++
Scratch resistance	+++	+	-	-	+
Gloss reduction	+++	+	+	+++	+
Texturing effect	+++	+++	+++	+	+++
Other properties	Good slip control/ Improved cleanability		Poor solvent resistance in some cases	Increase in viscosity	Poor stability/ Recoatibility issue

Relative properties of the main types of alternative texturing additives used in coil coating



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