



# Rilsan® Fine Powders and Coatings Main Properties

## PHYSICAL PROPERTIES

Rilsan® Fine Powders are thermoplastic polyamide 11 powders used primarily for metal coating. These coatings are characterized by their excellent durability, with outstanding toughness, impact and abrasion resistance, as well as excellent weatherability and corrosion resistance.

### GENERAL PROPERTIES

<b>Melt. point</b> Standard grades Invent grades	ISO 11357	186-190°C 201°C
<b>Vicat point</b>	ISO 306	181°C
<b>Specific gravity at 20°C</b>	ISO 1183	natural powders 1.040 g/cm <sup>3</sup> dipping and ES powders, white 1.065 g/cm <sup>3</sup> to 1.25 g/cm <sup>3</sup>
<b>Water absorption to saturation</b>	ISO 62/1	at 20°C and 65% RH 0.9 to 1.1% depending on grade at 20°C and 100% RH 1.6 to 1.9% depending on grade at 100°C and 100% RH (boiling water) 2.4 to 3% depending on grade

### GENERAL PROPERTIES

		Laser sintered part	Stripped coating
Tensile modulus	ISO 527	1500 MPa	1000-1200 MPa
Tensile strength at yield		45-50 MPa	40-45 MPa
Elongation at yield		18-24%	18-24%
Tensile strength at break		45 MPa	39-47 MPa
Elongation at break		45%	>200%
Flexural modulus	ISO 178 (23°C)	1200 MPa	1100-1200 MPa
Shore D hardness	ISO 868 (20°C)	77	70-85
Impact strength (Charpy – unnotched)	ISO 179 1eU (23°C)	No break	No break

### ELECTRICAL PROPERTIES OF RILSAN® COATINGS

<b>Surface resistivity</b> at 20°C and 65% RH at 500 V	ASTM D 257	2.4 x 10 <sup>14</sup> Ω
<b>Dielectric constant</b>	102 Hz 106 Hz	3.9 3.1
<b>Transverse or volume resistivity</b> at 20°C and 65% RH at 500 V	ASTM D 257	10 <sup>14</sup> to 10 <sup>16</sup> Ω.cm
<b>Tangent of the angle of loww (power factor)</b> at 1,000 V R.M.S., with a current of 1,000 Hz (at 20°C and 65% RH)		0.05
<b>Resistance to surface tracking KA method</b>	DIN 53-480	Grade KA3c
<b>Dielectric rigidity</b> ES powders thickness ± 100 μm Dipping powders, thickness 350 to 450 μm	ASTM D 149	55 to 90 kV/mm 30 to 36 kV/mm
<b>Dielectric strength</b> Influence of the thickness studied on a natural coating (measured at 20°C and 65% RH)	0.20 mm 0.43 mm 0.70 mm 0.90 mm	52.8 kV/mm 38.4 kV/mm 34.7 kV/mm 33.1 kV/mm

## SPECIFIC PROPERTIES OF RILSAN® COATINGS

Hardness measured with a Persoz pendulum at 20°C	ISO 1522	200-280
Surface hardness at 20°C, 10s under load	DIN 53-456	80N/mm $\bar{C}$
<b>Scratch resistance</b> Clemen apparatus; load necessary to induce a scratch which reaches the underlying metal for a coating of 0.4 mm thickness	ISO 1518	59 N
<b>Pencil hardness</b>	ECCA T4	Note: B
<b>Shear strength</b>	ASTM D 732	35-42N/mm $^2$
<b>Impact resistance</b> Dip coating powder (thickness 350 $\mu$ m) ES powders (thickness 100 $\mu$ m)	ASTM G14 ISO 3678 ISO 6272	> 2 J > 2.5 J > 19 J
<b>Abrasion resistance</b> Taber abrasimeter (wheel type CS 17, load 1 kg) Loss of weight after 1,000 cycles	ISO 9352	15mg
<b>Coefficient of friction</b> Black powders	NFT 54-112 (8) Static K Dynamic K	0.15-0.3 0.05-0.2
<b>Flexibility</b> Conical mandrel folding	ISO 6860	> 35%
<b>Specific heat</b>		2.09kJ/kg.K
<b>Thermal conductivity</b>		0.29 W/mK between 50° and 170°C
<b>Latent heat of fusion</b>		83.7kJ/kg
<b>Inflammability</b> measured at a thickness greater than 3 mm to eliminate the influence of the substrate	ASTM D 635	self-extinguishing
<b>Resistance to boiling water</b> after 2,000 hours; neither bubbling nor modification	ISO 1521	Excellent adhesion
<b>Resistance to outdoor exposure</b>	ASTM D 1235	3 years Florida exposure: Excellent adhesion
<b>Resistance to salt water</b>		No corrosion after 10 years exposure
<b>Salt spray resistance</b>	ISO 9227 on scribed primed plates (testing according to WIS 4-52-01)	< 1 mm corrosion after 2000 hours

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