

Protection Tests (IP Code)



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Test chambers
ST1000/ST2000

Configuration ST1000

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Technical data

Principle

Dust test with wind
Type ST 600

Standards



Dust Test



Content

IP = International Protection-Code

Nomenclature

Figures

Test chambers
ST1000/ST2000

Configuration ST1000

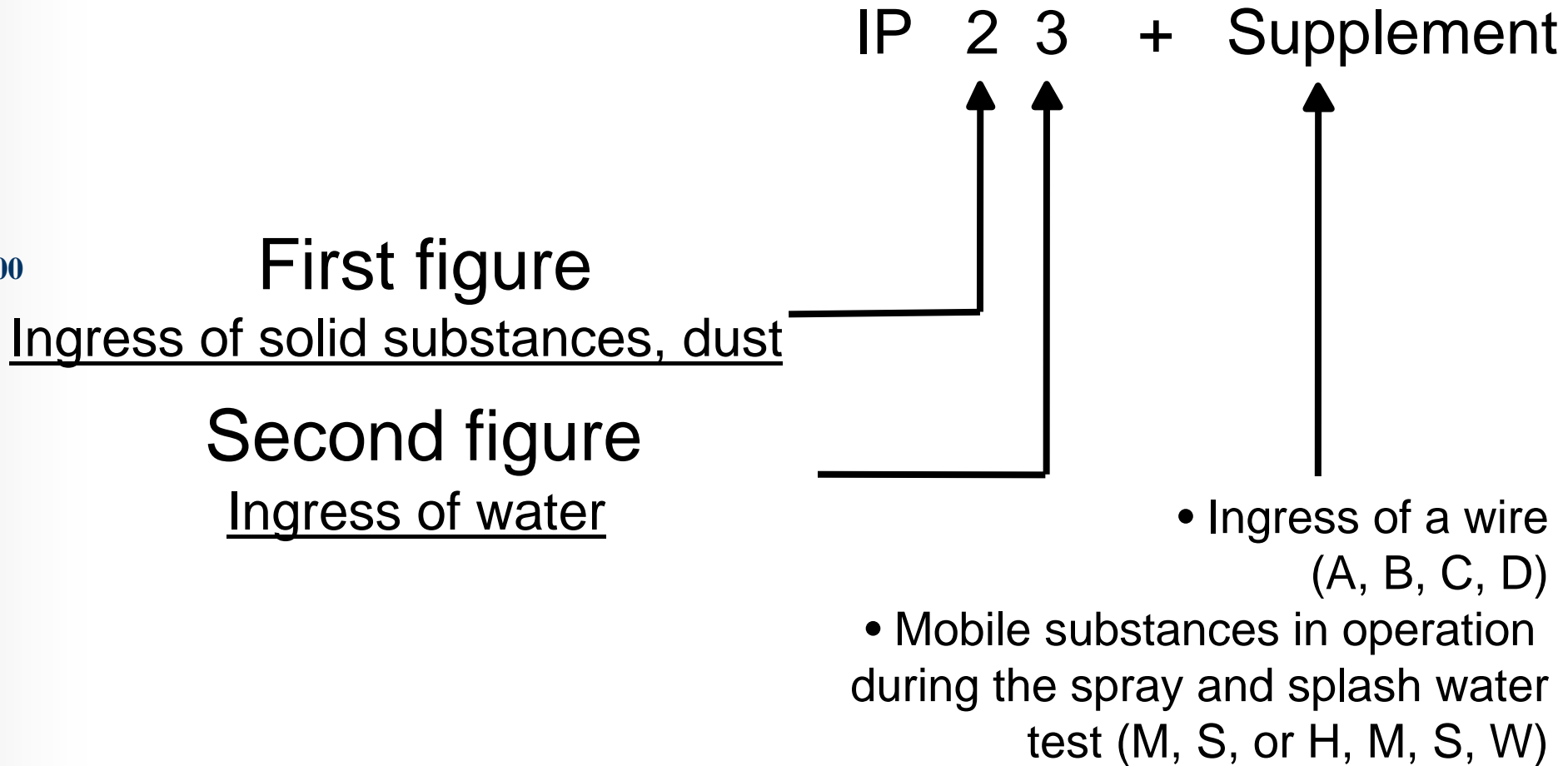
Options

Technical data

Principle

Dust test with wind
Type ST 600

Standards



Dust Tests, 1st figure: IP XX

Content

Nomenclature

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Test chambers ST1000/ST2000

Configuration ST1000

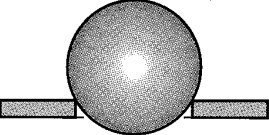
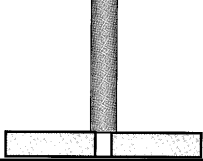
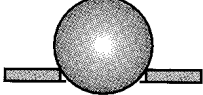
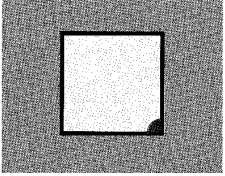
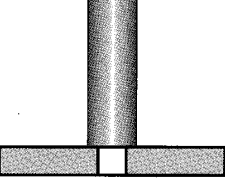
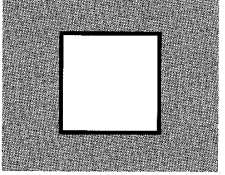
Options

Technical data

Principle

Dust test with wind Type ST 600

Standards

1st figure	Protection against ...		1st figure	Protection against ...	
1	$\geq \varnothing 50 \text{ mm}$		4	$\geq \varnothing 1 \text{ mm}$	
2	$\geq \varnothing 12,5 \text{ mm}$		5	dust protected	
3	$\geq \varnothing 2,5 \text{ mm}$		6	dust tight	

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Test chambers ST1000/ST2000

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Technical data

Principle

Dust test with wind Type ST 600

Standards

- **Reproducible testing of the resistibility of electro-technical products against dust**
- **Determination of IP-protection types**

Advantages

- **Chambers meet important test standards**
- **Ready for connection**
- **Compact design**
- **Easy to operate**
- **Easy to service**



Type ST 1000, ST 2000



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Nomenclature

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Test chambers
ST1000/ST2000

Configuration ST1000

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Technical data

Principle

Dust test with wind
Type ST 600

Standards



Type ST 1000 - Configuration



Content

ST 1000 for standard SAE J575
ST 1000U for DIN/VDE 470 part 1 (EN 60529)
IEC 68-2-68, La2 (DIN EN 60068 -2-68)

Nomenclature

Figures

Test chambers
ST1000/ST2000

Configuration ST1000

Options

Technical data

Principle

Dust test with wind
Type ST 600

Standards

Design features

- Waste air exhaust via dust filter
- Abrasion resistance of all components in contact with the dust
- Transparent doors for easy charging, with surrounding special gaskets
- Dust collecting section below the test chamber
- Wiper
- Vertical air flow



Content

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Test chambers ST1000/ST2000

Configuration ST1000

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Technical data

Principle

Dust test with wind Type ST 600

Standards

Additional equipment

- Test room lighting, mobile design
- Low pressure system for specimen
- Ports 50 and 100 mm Ø

Technical Data ST1000

Dimensions							
Interior dimensions			Exterior dimensions			Door dimensions	
Height [mm]	Width [mm]	Depth [mm]	Height [mm]	Width [mm]	Depth [mm]	Height [mm]	Width [mm]
1.000	950	950	1.900	1.250	1.050	850	850

Test space volume 900 l, aluminium

Exterior finish: front violet-blue, housing light-grey and white,

Weight 220 kg

Connected load 1,5 kVA, power supply 400 V; 3 Ph + N + PE; 50 Hz

Content

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Test chambers ST1000/ST2000

Configuration ST1000

Options

Technical data

Principle

Dust test with wind Type ST 600

Standards

Technical Data ST2000

Dimensions							
Interior dimensions			Exterior dimensions			Door dimensions	
Height [mm]	Width [mm]	Depth [mm]	Height [mm]	Width [mm]	Depth [mm]	Height [mm]	Width [mm]
950	1900	950	1.900	2300	1.050	860	1800

Test space volume 2000 l, aluminium

Exterior finish: front violet-blue, housing light-grey and white,

Weight 450 kg, Weight of specimen on shelf max. 120 kg,

Connected load 2,5 kVA, power supply 400 V; 3 Ph + N + PE; 50 Hz

Type ST 1000 – Schematic Diagram

Content

Nomenclature

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Test chambers
ST1000/ST2000

Configuration ST1000

Options

Technical data

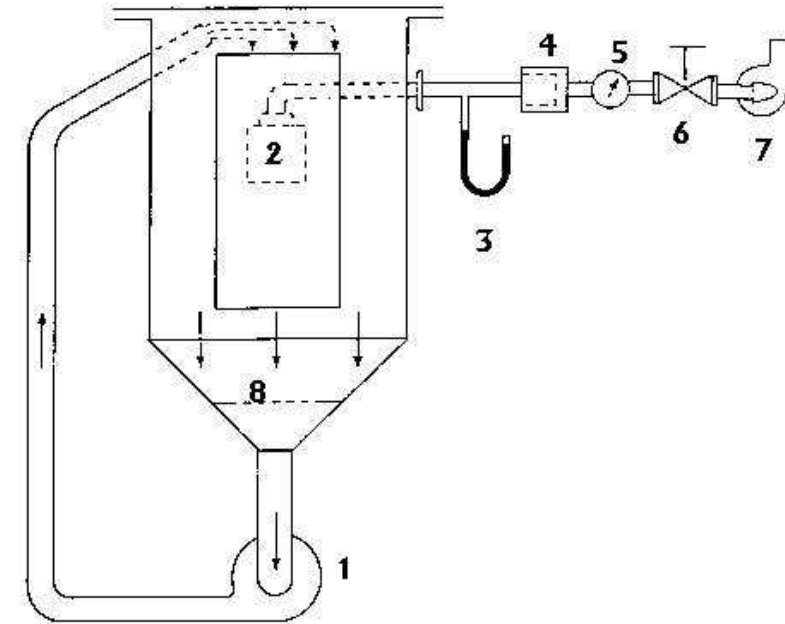
Principle

Dust test with wind
Type ST 600

Standards

Design

- Vertical air flow
- Cubic vessel with collection funnel
- Dust is blown into the test space from the top by means of a circulation fan
- Dust parts are collected in the collection funnel
- Star-shaped rotating slide to bring dust into the opening



1 dust circulation pump
3 pressure display
5 air flow meter
7 vacuum pump

2 specimen
4 dust filter
6 valve
8 collection funnel

Type ST 600



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Principle

Dust test with wind
Type ST 600

Standards



Type ST 600 - Configuration



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Test chambers ST1000/ST2000

Configuration ST1000

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Technical data

Principle

Dust test with wind Type ST 600

Standards

Design features

- Housing made of galvanised sheet steel, lacquered
- Ring duct with integrated test space
- Horizontal air flow with temperature conditioning system
- Uniform and steered air flow
- Air velocity control (speed controllable recirculating air fan)
- Abrasion resistance of all components in contact with the dust
- Large doors for easy loading, with surrounding special gaskets
- Dust measurement and control by means of a dust dosage device
- Dehumidification system (compressed air dryer)
- Operating hour counter

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Test chambers ST1000/ST2000

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Principle

Dust test with wind Type ST 600

Standards

Additional equipment

- Digital time programme controller
- Ports 50 and 100 mm Ø
- Low pressure system for specimen
- Registration of temperature, air velocity and dust density
- Rotary table, 300 mm Ø

Type ST 600 – Technical Data



Content	Test space	steel, lacquered, volume 640 l
Nomenclature	Interior dimensions	H 800 x W 1000 x D 800 mm
Figures	Exterior dimensions	H 2400 x W 4350 x D 1500 mm
Test chambers ST1000/ST2000	Test room door	H 740 x W 740 mm
Configuration ST1000	Temperature range	5 - 40°C
Options	Specimen weight	max. 100 kg
Technical data	Air velocity	1,5 / 3 / 5 m/s
Principle	Constancy in time	+/- 0,2 to 0,5 m/s (test space center)
<u>Dust test with wind Type ST 600</u>	Dust reservoir	20 kg contents
Standards	Compressed air connection	max. 6 bar
	Power supply	400 V, 3 Ph + N + PE, 50 Hz
	Connected load	approx. 25 kVA
	Dust concentration	2 - 10 g/m ³ fine dust



Type ST 600 – Schematic Diagram

Content

Nomenclature

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Test chambers ST1000/ST2000

Configuration ST1000

Options

Technical data

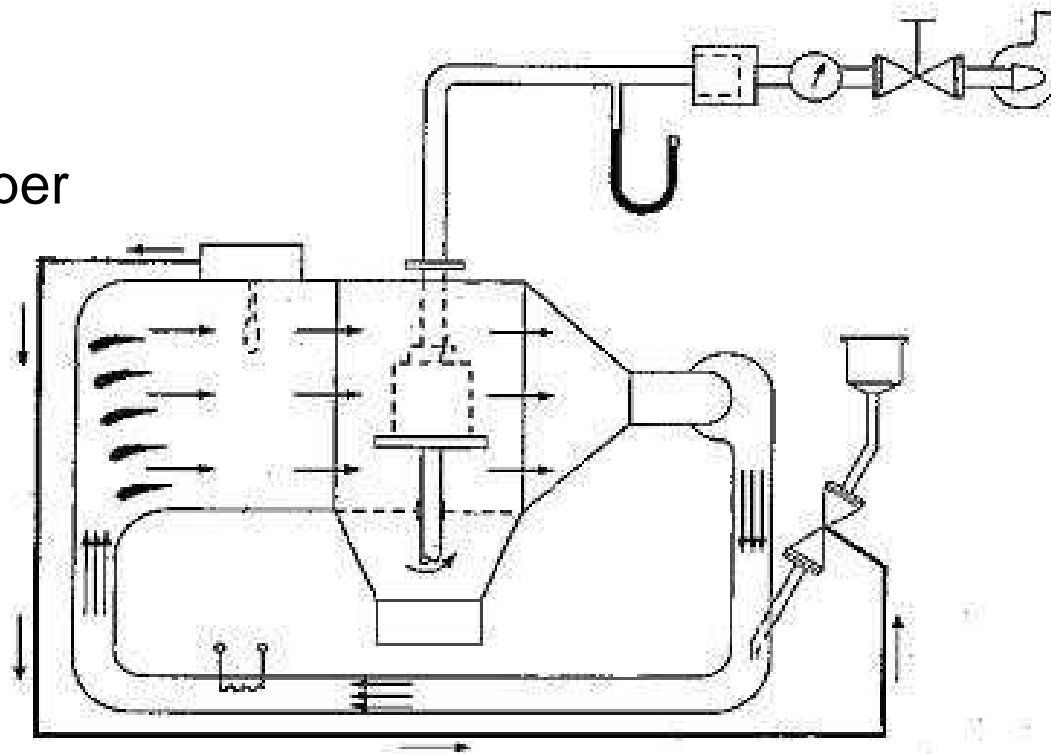
Principle

Dust test with wind Type ST 600

Standards

Design

- Horizontal air flow
- Ring duct for air circulation
- Large door
- Observation window with wiper
- Uniform suction of dusty air
- Uniform temperature conditioning
- High temperature constancy (spatial)
- No cooling!
- Option dust density control 0-100%



Type ST 600 – Schematic Diagram



Content

Nomenclature

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Test chambers
ST1000/ST2000

Configuration ST1000

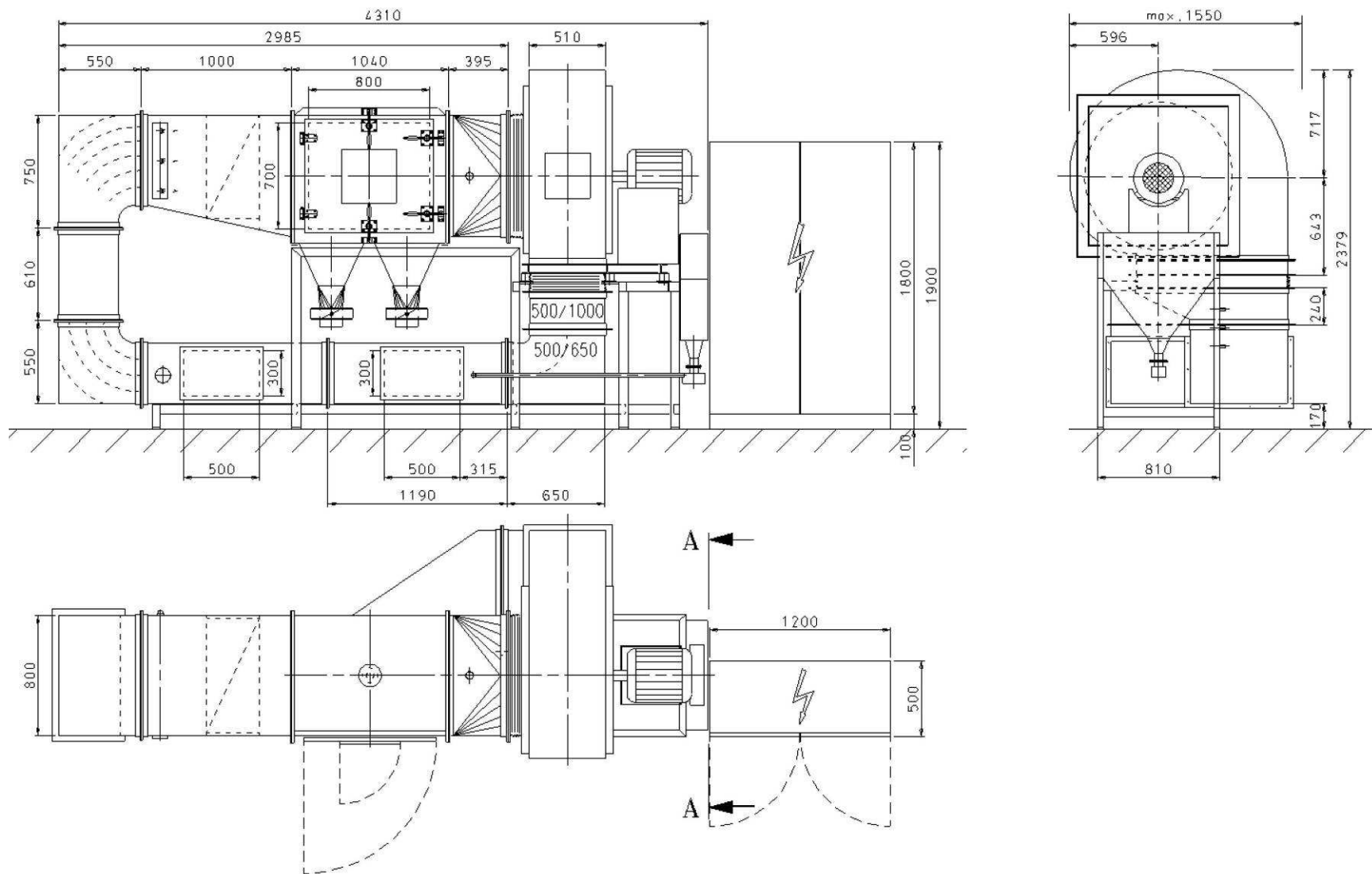
Options

Technical data

Principle

Dust test with wind
Type ST 600

Standards



Type ST 600

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Technical data

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Dust test with wind
Type ST 600

Standards



Dust dosage device

Dust Test – Test Specifications



Content

Nomenclature

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Test chambers ST1000/ST2000

Configuration ST1000

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Technical data

Principle

Dust test with wind Type ST 600

Standards

No.	Test Specification	Protection Grade	Test Duration	Temperature (°C)	Rel. Humidity (%)	Air - velocity (m/sec.)	Dust Density	Dust Composition	Particle Size
1	DIN/VDE 470 part 1 picture 2 (EN 60529)	IP 5 X dust protected resp. IP 6 X dust-tight	2 - 8 h depending on the air flow rate			vertically, to achieve slowest possible down-ward settlement	2 kg per m ³ chamber volume	100 % dry fine grained talcum	wire diameter 50 µm, mesh size 75 µm, square mesh
	ST 1000U								
2	IEC 68-2-68, La2 (DIN EN 60068-2-68)		2 - 8 h depending on the air flow rate		<25 %	vertically, to achieve slowest possible down-ward settlement	2 kg per m ³ chamber volume	100 % dry fine grained talcum	wire diameter 50 µm, mesh size 75 µm, square mesh
	ST 1000U								
3	IEC 68-2-68, Lc1 (DIN EN 60068-2-68)		2 - 24 h		<25 %	1,5 - 10 horizontal	1 ± 0,3 2 ± 0,5 5 ± 1,5 10 ± 3	Olivin, quartz or felspar	fine dust 2-75 µm dust 2-150 µm
	ST 600								



Dust Test – Test Specifications



Content

Nomenclature

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Test chambers
ST1000/ST2000

Configuration ST1000

Options

Technical data

Principle

Dust test with wind
Type ST 600

Standards

No.	Test Specification	Protection Grade	Test Duration	Temperature (°C)	Rel. Humidity (%)	Air - velocity (m/sec.)	Dust Density	Dust Composition	Particle Size
4	DIN 40050 part 9, May 1993 picture 1 vertically	IP 5KX IP 6KX	20 cycles 15 min Pause, 6 sec. dust whirl up				2 kg per m ³ chamber volume	50 % limestone 50 % flue dust	33 weight parts ≤ 32 µm 67 weight parts ≥ 32 µm; ≤ 250 µm
	ST 600								
	DIN 40050 part 9, May 1993 picture 2 horizontal	IP 5K X IP 6K X	0,5 - 24 h			1,5	5 ± 2	50 % limestone 50 % flue dust	33 weight parts ≤ 32 µm 67 weight parts ≥ 32 µm; ≤ 250 µm
5	MIL-STD-810D Method 510.2 (flue dust)		6 + 16 h	23 °C	max. 30 %	9 and 1,5	10,6 ± 7	97-99 % SiO ₂	US standard 100 % No. 100 98±2 No. 140 90±2 No. 200 75±2 No. 325
	ST 600								
6	SAE standard J 575		5 h 15 min Pause, 2 - 15 sec whirl up dust					Portland cement acc. to ASTM C 150-77, Type 1	
	ST 1000								

