

DONACARBO

Application in conductive screeds for floorings

Description

Donacarlo S fibers are used instead of carbon black or graphite in antistatic floorings. These fibers are especially suggested in top coats when light colors are required.

Formulation

The following procedure is recommended:

1. Donacarlo S is the last component to be added to the formulation of the floor coating.
2. Depending on the coating formula and function, we suggest an extra addition of a wetting agent (e.g. Antiterra U of Byk) in order to simplify mixing.
3. Addition of 1.0 to 2.0 % (!) Donacarlo S carbon fiber..
4. Blend in fibers with a dissolver positioned at medium rpm speed.
5. Control blend on a glass panel or similar. To air the mixture let it settle for approx.. half an hour.
6. Make a test sample.
7. Roll on test coating with a spiked roller to eliminate any air bubbles and to erect carbon fibers.

Remarks

Optimum addition of Donacarlo S should be established by testing. Low amounts allow cost saving application. Chemical resistance depends on binder.

Fiber length

Primer:

For the application in primers Donacarlo S 241, S 242 or S 2415 is recommended.

Top Coat:

The selection of the fiber length basically depends on the coat thickness. Depending on the coat thickness we recommend Donacarlo S 244, S 246, S 247 or S 231. The fiber should be slightly longer than the coat thickness (example: for a coat thickness of 1 mm we recommend 1.2 mm fiber).

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Electric resistivity / conductivity

By addition of Donacarlo S carbon fibers, the electric resistivity can be reduced and the conductivity increased. Depending on the flooring system ground resistivities of approx. 103 to 106 Ohm can be achieved with the Donacarlo S fibers.

Reference

The suitability of carbon fibers for the regulation of electric conductivity in floorings has been confirmed by the worksheet "AGI Arbeitsblatt Nr. S 30" (issued by the Workgroup of Industrial Engineers) as well as in various trade journals like "Industriebau, Ausgabe 02/2001", page 24ff.

Standards

The following are important DIN standards for the manufacture of electrostatically conductive, shunting as well as antistatic floor coatings:

DIN IEC 61340-4-1: Leak resistance, Earth leakage resistance

DIN IEC 61340-5-1: Electrostatics, General requirements

Standard ESD STM 97.2: Personnel voltage measurement „Walking Test“

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Chemical stability

The Donacarbo S fiber is especially stable against non-oxidating reagents.

Chemicals	Concentration [%]	Time[h]	Temperature [°C]	Stability	
				S-Fiber	SG-Fiber
HCl (hydrochloric acid)	35	150	60	+	+
	36	96	70	+	*
	36	312	70	+	*
HNO ₃ (nitric acid)	30	150	RT	0	+
	61	48	70	0	*
	61	120	70	-	*
	61	150	60	-	+
CrO ₃ (chromic acid/ Chromium oxide)	35	150	RT	+	+
	50	150	RT	+	+
NaOH (sodium hydroxide)	50	150	40	+	+

Sample: Donacarbo S-Faser, carbonized, S-210 (mat)

Donacarbo SG-Faser, graphitized, SG-210 (mat)

Method: Osaka Gas Chemicals (tensile strength and O₂ concentration)

Mark: + excellent

0 fair

- poor

* no measurement

Technical data established by OSAKA GAS Co., Ltd R & D Center, Osaka, Japan. Detailed health and safety information please find in the corresponding material safety data sheet.

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Micro Elements

Donacarlo S has a minimum carbon content of 95%. Donacarlo SG has a minimum carbon content of 99%.

Elements	Donacarlo S	Donacarlo SG	Method
B (boron)	< 10 ppm	< 10 ppm	Colorimetry
Mg (magnesium)	0,2 ppm	< 0,1 ppm	ICP-MS
Al (aluminium)	0,8 ppm	0,1 ppm	ICP-MS
K (potassium)	4 ppm	no measurement	Atomic Absorption
Ca (calcium)	1 ppm	no measurement	ICP-MS
Cr (chrome)	1,6 ppm	0,6 ppm	Atomic Absorption
W (wolfram)	< 0,1 ppm	< 0,1 ppm	ICP-MS
Ni (nickel)	1,9 ppm	1,1 ppm	ICP-MS
SiO ₂ (silica/ anhydride)	36 ppm	no measurement	ICP-MS

These data were established by Osaka Gas Chemicals in Japan.
The milled Donacarlo fibers S 249, S 241 and SG 249 were examined.
Donacarlo S (milled and carbonized fibers) contain 200 – 300 ppm Fe.