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## Technical data sheet Heating coatings

### Product features

#### Intended use

Carbon coatings for application as **heating paint, heating coating, heating varnish.**

#### Application examples

Heating coatings for walls in random buildings and rooms, coating of plasterboards, coating of heating films used as floor heating, de-icing systems, vehicles, electrical utility vehicles, planes, railway equipment, ...

#### Corrosion resistance

All products don't contain metal particles. Based on carbon they are long-term durable and not oxidizing.

### Safe material handling

#### Safety notes

All products have a high coloring capability, so please proceed with care. Wipe off stains immediately with damp cloth. Do not let stains dry up. Do not inhale spray mist! Absolutely make sure, that all areas are well ventilated during use and drying time. Do not eat, drink or smoke during application! Rinse thoroughly immediately after skin or eye contact!

**CSG-IRx-6x, CSG-IRx-7x:** These products have a pH-value of 12 (superalkaline), the application should be done with protective equipment (gloves, safety glasses, etc.) only.

#### VOC-content

**All products:** 0.1 g/l VOC. The EU limit value for cat. A/a is 30g/l (by 2010).

#### Ingredients

**CSG-IRP-5100:** Water, pure acrylics dispersion, carbon fibers, carbon black, additives, preservative.

**CSG-IRx-5x:** Water, pure acrylics dispersion, graphite, carbon black, additives, preservative.

**CSG-IRx-6x:** Water, graphite, potassium silicate, pure acrylics dispersion, carbon black, additives, preservative.

**CSG-IRx-7x:** Water, graphite, potassium silicate, carbon black, additives, no preservative.

**Preservative:** If stated above, the products contain MIT (2-Methyl-4-isothiazolin-3-on) and BIT (1,2-Benzisothiazolin-3-on) as preservation substances. Advisory service for allergic persons under telephone number 0041-(0)61-501-80-86.

### Processing

#### Application temperature

**CSG-IRx-5x:** Don't process under 10 °C air and underground temperature. Temperature must also not be below 10 °C during drying.

**CSG-IRx-6x, CSG-IRx-7x:** Don't process under 5 °C air and underground temperature. Temperature must also not be below 5 °C during drying.

#### Underground

**CSG-IRx-5x:** With pure acrylate as binder, excellent adhesive strength on nearly all undergrounds.

**CSG-IRx-6x:** With potassium silicate and acrylate as binders, excellent adhesive strength on all absorbent undergrounds. Also good adhesive strength on non-absorbent undergrounds if the underground is not flexible.

**CSG-IRx-7x:** With potassium silicate as binder, excellent adhesive strength on all absorbent undergrounds if the underground is not flexible.

#### Priming coat

**Highly absorbent undergrounds have to be treated with a primer first when using on walls, ceilings or floors.** In case of not using a primer, the binder will infiltrate together with the water in the substrate. In addition, this will lead to an aggravation of the physical characteristics of the heating coating.

#### Preparation

The conductive particles dispose at the bottom. **Stir the barrel thoroughly after opening.**

### Compatibility

All products are ready to use. **Must never be mixed with other coating materials.**

#### Application technique

The possible application techniques are versatile (but depend on the product, see table below): **Rolling, knife coating, airless, spraying, screen printing.**

#### Drying time

Let dry for 12-24 hours when working on walls, ceiling or floor. A force drying in technical applications with a higher temperature is possible. All products are free from semi-volatile filming aids, as soon as the water is evaporated the coating is cured.

#### Coating thickness

The coating thickness (wet film) depends on the application and cannot be stated precisely. **ICSG-IRP-x** and **CSG-IRE-x** need a minimum thickness of 150 µm, **CSG-IRE-x** and **CSG-IRG-x** can be applied significantly thinner in case the higher electrical resistance is still sufficient for the application.

### Further Information

#### Storage

Store cool and frost free. Once the container has been opened, close tightly after usage and store cool.

#### Period of storage

At least 12 months, see the batch sticker on the paint container.

### Disposal

Utensils have to be cleaned immediately after usage. Containers must be absolutely empty for recycling. Do not let remains escape into sewerage or ground.

#### Identification marks

Produktcode: M-DF01 (GISCODE)  
Water hazard class: 1 (VwVWS)  
Waste code: 08 01 12 (AVV)  
Hazardous ingredients: –  
ADR: –  
UN-number: –  
Transport hazard class: –  
Environmental dangers: –

#### Safety data sheet

The safety data sheet is available upon request under telephone number 0041-(0)61-501-80-86.

#### Disclaimer

Preceding information has been asserted to the latest state of processing and application technology. As we don't have any influence on processing and application, no liability can be accepted out of the contents of this information sheet. Processors are in either case bounded to a skilled evaluation of the processing, in consideration of the product attributes and fitness. Details and notwithstanding details, transcending the content of this information sheet, require our confirmation in writing.

Our general terms and conditions are valid as mentioned. With this newest edition of our technical data sheet all previous versions loose their validity.

	CSG IRP-5100	CSG IRF-5100	CSG IRF-6100	CSG IRF-7100	CSG IRE-550	CSG IRE-650	CSG IRE-750	CSG IRG-510	CSG IRG-610	CSG IRG-710
Short description	<b>Abraision-resistant hard surface without graphitising.</b> For wall-, ceiling- and floor coatings.	<b>Coarse surface with medium graphitising.</b> For wall-, ceiling- and floor coatings.	<b>Coarse surface with medium graphitising.</b> For wall-, ceiling- and floor coatings.	<b>Coarse surface with medium graphitising.</b> For wall-, ceiling- and floor coatings.	<b>Fine surface with low graphitising.</b> Universally applicable	<b>Fine surface with low graphitising.</b> Universally applicable.	<b>Fine surface with low graphitising.</b> Universally applicable.	<b>Very fine surface with low graphitising.</b> Universally applicable, especially for very thin layers.	<b>Very fine surface with low graphitising.</b> Universally applicable, especially for very thin layers.	<b>Very fine surface with low graphitising.</b> Universally applicable, especially for very thin layers.
Stock status	<b>Standard product</b> ex stock	Ex stock	Ex stock	Ex stock	<b>Standard product</b> ex stock	<b>Standard product</b> ex stock	Produced upon order	Produced upon order	Produced upon order	Produced upon order
Electrical resistance *	<b>8 Ω□</b>	<b>2 Ω□</b>	<b>1.5 Ω□</b>	<b>1 Ω□</b>	<b>3 Ω□</b>	<b>2.5 Ω□</b>	<b>2 Ω□</b>	<b>6 Ω□</b>	<b>5.5 Ω□</b>	<b>5 Ω□</b>
Maximum Temperature	100 °C	100 °C	150 °C	200 °C	100 °C	150 °C	200 °C	100 °C	150 °C	200 °C
Binder	<b>Pure acrylics</b>	<b>Pure acrylics</b>	<b>Silicate, acrylate</b>	<b>Pure silicate</b>	<b>Pure acrylics</b>	<b>Silicate, acrylate</b>	<b>Pure silicate</b>	<b>Pure acrylics</b>	<b>Silicate, acrylate</b>	<b>Pure silicate</b>
Pigmentation	Carbon black, <b>carbon fibers 100µm</b>	Carbon black, <b>graphite 100µm</b>	Carbon black, <b>graphite 100µm</b>	Carbon black, <b>graphite 100µm</b>	Carbon black, <b>graphite 50µm</b>	Carbon black, <b>graphite 50µm</b>	Carbon black, <b>graphite 50µm</b>	Carbon black, <b>graphite 10µm</b>	Carbon black, <b>graphite 10µm</b>	Carbon black, <b>graphite 10µm</b>
Filtered	No, can contain bigger particles	Nein, kann größere Pigmente enthalten	Nein, kann größere Pigmente enthalten	Nein, kann größere Pigmente enthalten	Yes, filtered with 100 µm	Yes, filtered with 100 µm	Yes, filtered with 100 µm	Yes, filtered with 35 µm	Yes, filtered with 35 µm	Yes, filtered with 35 µm
Ecology	High	High	Very high	Very high	Very high	Very high	Very high	High	Very high	Very high
VOC-content **	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l	0.1 g/l
PAK-content ***	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg
Solvents	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Underground	Almost all substrates	Almost all substrates	All absorbent substrates	All absorbent substrates	Almost all substrates	All absorbent substrates	All absorbent substrates	Almost all substrates	All absorbent substrates	All absorbent substrates
Yield	5 - 7.5 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l	5 - 10 m <sup>2</sup> /l
Moisture resistance	High	High	High	High	High	High	High	High	High	High
Application	Rolling, knife coating	Rolling, knife coating, airless	Rolling, knife coating, airless	Rolling, knife coating, airless	Rolling, knife coating, airless, spraying, silk-screen printing	Rolling, knife coating, airless, spraying, silk-screen printing	Rolling, knife coating, airless, spraying, silk-screen printing	Rolling, knife coating, airless, spraying, silk-screen printing	Rolling, knife coating, airless, spraying, silk-screen printing	Rolling, knife coating, airless, spraying, silk-screen printing
Adhesion tensile strenght	3.3 N/mm <sup>2</sup>	2.9 N/mm <sup>2</sup>	2.6 N/mm <sup>2</sup>	3.2 N/mm <sup>2</sup>	4.2 N/mm <sup>2</sup>	3.4 N/mm <sup>2</sup>	4.2 N/mm <sup>2</sup>	6.9 N/mm <sup>2</sup>	6.6 N/mm <sup>2</sup>	7.4 N/mm <sup>2</sup>
Viscosity (Brookfield)	2200 mPas	2100 mPas	2300 mPas	2300 mPas	2200 mPas	2200 mPas	2200 mPas	2200 mPas	2200 mPas	2200 mPas
Rheology	Newtonian	Newtonian	Shear thinning	Shear thinning	Newtonian	Shear thinning	Shear thinning	Newtonian	Shear thinning	Shear thinning
Film properties	Elastic tough	Elastic tough	Medium hard	Hard	Elastic tough	Medium hard	Hard	Elastic tough	Medium hard	Hard
Color	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Sd-value	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m	0.1 m
PH-value	8	8	12	12	8	12	12	8	12	12
Density	1.18 kg/l	1.26 kg/l	1.22 kg/l	1.34 kg/l	1.22 kg/l	1.23 kg/l	1.29 kg/l	1.11 kg/l	1.19 kg/l	1.22 kg/l
Solids content	48 %	52 %	48 %	43 %	50 %	48 %	43 %	39 %	38 %	33 %
MFFT	10 °C	10 °C	5 °C	5 °C	10 °C	5 °C	5 °C	10 °C	5 °C	5 °C
Frost resistance ****	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles	5 frost/thaw cycles
Packaging sizes	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter	1 / 5 / 20 liter
Storage stability	12 months	12 months	12 months	12 months	12 months	12 months	12 months	12 months	12 months	12 months

\* Square resistance at 200 µm wet film thickness = 5 qm yield per liter = 80 µm dry film thickness.

\*\* Volatile organic compounds. The EU limit value for cat. A/a is 30 g/l (by 2010).

\*\*\* Polycyclic aromatic hydrocarbons. The nonbinding EU limit value for children toys is 0.2 mg/kg.

\*\*\*\* The given frost resistance is valid liquid in the container, of course on the underground its permanent frost-resistant.