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## SynWire W 220 Flat

- Enamelled flat copper wire, thermoresistant
- Insulated with polyamide-imide
- Class 220

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### Attributes

SHTherm® 220 Flat is a highly thermoresistant enamelled copper wire of heat performance class R with superior thermal, chemical and mechanical resistance. It is used for special applications requiring the following criteria:

- very high permanent thermal resistance and short-time thermal overload
- very good resistance to aggressive mediums in liquid or gas form

SHTherm® 220 Flat is ideally suited for use in special safety-relevant and electrical life support equipment. Sophisticated process technology and process setting ensure easy mouldability, good elongation and constant insulation properties of these wires.

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### Application

E-Mobility, hybrid constructions

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### Standards

IEC / DIN EN 60317-58

NEMA MW 84-C

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### Delivery forms

Grade 1: on request

Grade 2: on request

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Updated 06/18



Typical properties of enamelled flat copper wire 5.60 x 3.55 mm, with insulation film grade 2

| <b>Mechanical</b>                          | Unit of measure | Set value                    | Actual value (typ.) |
|--------------------------------------------|-----------------|------------------------------|---------------------|
| Width with varnish                         | mm              | 5.67 - 5.82                  | as set value        |
| Bare wire width                            | mm              | 5.550-5.650                  | as set value        |
| Thickness with varnish                     | mm              | 3.62 - 3.77                  | as set value        |
| Bare wire thickness                        | mm              | 3.500-3.600                  | as set value        |
| Varnish increase                           | µm              | 120 - 170                    | as set value        |
| Adhesion (no cracks in film after winding) |                 | mandrel diameter             |                     |
| Bend over width                            |                 | 4 x width                    | 3 x width           |
| Bend over thickness                        |                 | 4 x thickness                | 3 x thickness       |
| Elongation                                 |                 | 15 % with cracks < 1 x width | 32 % without cracks |
| Pencil hardness                            |                 | H                            | 4H - 5H             |
| Elongation at break                        | %               | ≥ 32                         | ≥ 38                |

| <b>Thermal</b>                                                 | Unit of measure | Set value                         | Actual value (typ.)               |
|----------------------------------------------------------------|-----------------|-----------------------------------|-----------------------------------|
| Temperature index TI                                           | °C              | 220                               | 220                               |
| Heat shock at 240 °C (no cracks in varnish coat after winding) |                 | mandrel diameter<br>6 x thickness | mandrel diameter 4<br>x thickness |

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| Thermal       | Unit of measure | Set value | Actual value (typ.) |
|---------------|-----------------|-----------|---------------------|
| Solderability |                 | no        | no                  |

| Electrical                                       | Unit of measure | Set value        | Actual value (typ.) |
|--------------------------------------------------|-----------------|------------------|---------------------|
| Dielectrical strength at RT                      | kV              | ≥ 2.0 (ball pit) | ≥ 3 (ball pit)      |
| High voltage discontinuities test voltage 2,5 kV |                 | /                | ≤ 7 on 100 m        |
| Electrical conductivity                          | MS/m            | 58 - 59          | ≥ 58.5              |

| Chemical                                                     | Set value | Actual value (typ.) |
|--------------------------------------------------------------|-----------|---------------------|
| Pencil hardness (storage in standard solvent ½ h / 60 °C)    | min. H    | 3H - 5H             |
| Pencil hardness (storage in alcohol ½ h / 60 °C)             | min. H    | 3H - 5H             |
| Resistance to commercial impregnants <sup>(1)</sup>          | /         | yes                 |
| Resistance to commercial refrigerants <sup>(1)</sup>         | /         | yes                 |
| Resistance to commercial dry transformer oils <sup>(1)</sup> | /         | yes                 |
| Resistance to commercial hydraulic oils <sup>(1)</sup>       | /         | yes                 |

(1) Due to the variety of individual applications we cannot make any generally binding commitments regarding the compatibility. We recommend testing compatibility with the materials being used.

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