

---

## SynWire W 220 Flat

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

---

### 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.

---

### Application

E-Mobility, hybrid constructions

---

### Standards

IEC / DIN EN 60317-58

NEMA MW 84-C

---

### Delivery forms

Grade 1: on request

Grade 2: on request

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.

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 |

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.  
Updated 06/18



| 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^(1)                  | /         | yes                 |
| Resistance to commercial refrigerants^(1)                 | /         | yes                 |
| Resistance to commercial dry transformer oils^(1)         | /         | yes                 |
| Resistance to commercial hydraulic oils^(1)               | /         | 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.

The information on this data sheet is based on the information provided by our supplier. It does not represent any specification or agreements regarding conditions or properties. The indicated values are standard values. Deviations from those values due to production and application cannot be excluded. The information on this data sheet is addressed to experts who use it at their own discretion and at their own risk. We do not guarantee results, or accept liability for the indicated specifications or for results obtained based on the specifications. Please contact us for more detailed information. Non-toxic and toxic substances are listed on the safety data sheet.  
Updated 06/18

