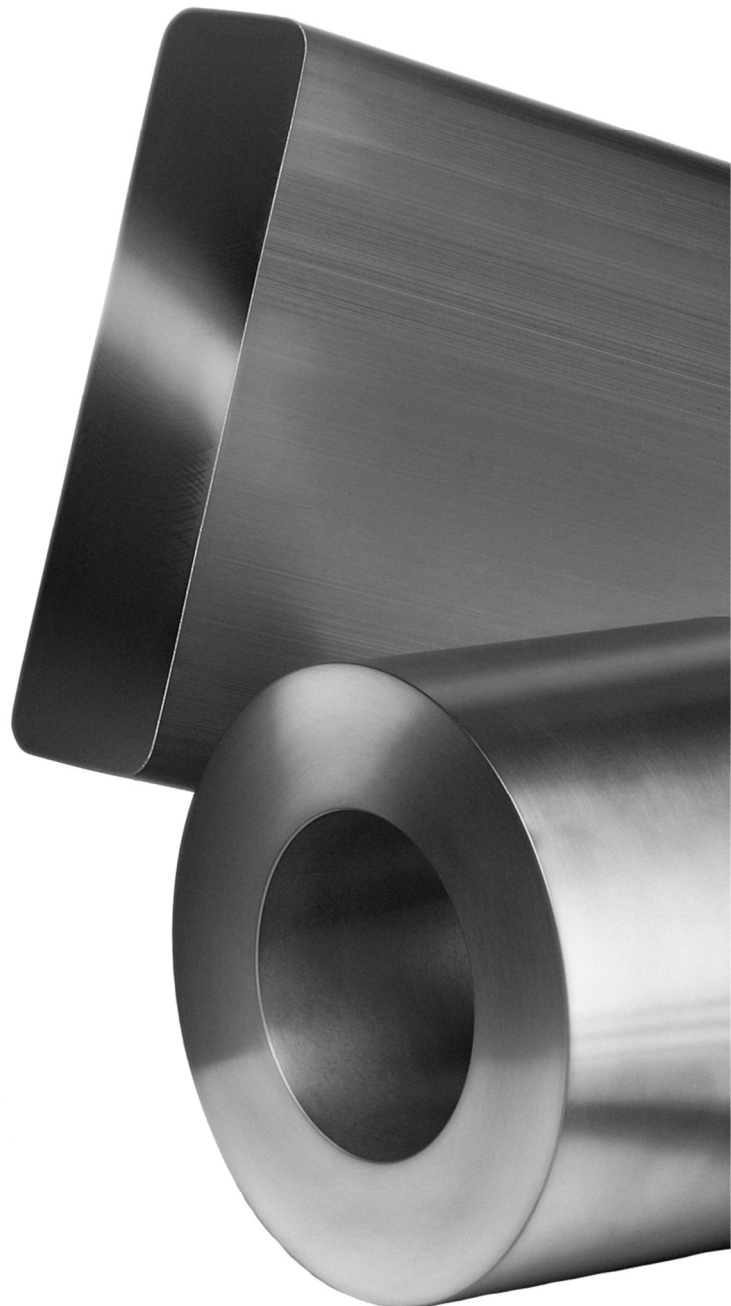


DATA SHEET: GPM-4.3.0-DB-002 Rev. 00 (replaced P-4.3-DB-002)

## DISPAL<sup>®</sup> S220

The physical and mechanical properties depend on geometry and the production process. All mechanical properties are preliminary minimal values (average minus 3 Sigma) taken from specimen Ø30mm and for all other geometries only for reference.



## **PHYSICAL PROPERTIES**

(At 20°C)

| Property                | Unit              | Value       |
|-------------------------|-------------------|-------------|
| Density                 | g/cm <sup>3</sup> | 2.54 ± 5%   |
| Electrical conductivity | MS/m              | 15.7 ± 0.5  |
|                         | %IACS             | 27.1 ± 0.9  |
| Heat capacity           | J/gK              | 0.85 ± 0.02 |

## **THERMAL CONDUCTIVITY**

| Temperature (°C) | 30    | 100   | 200   | 300   | 400   |
|------------------|-------|-------|-------|-------|-------|
| Value (W/mK)     | 152.4 | 144.3 | 136.8 | 131.0 | 123.5 |

## **COEFFICIENT OF THERMAL EXPANSION**

| Property              | Unit                | Value      |
|-----------------------|---------------------|------------|
| CTE-value 20 to 100°C | 10 <sup>-6</sup> /K | 15,1 ± 0.5 |
| CTE-value 20 to 200°C | 10 <sup>-6</sup> /K | 16,0 ± 0.5 |
| CTE-value 20 to 300°C | 10 <sup>-6</sup> /K | 16,8 ± 0.5 |

## **THERMAL DATA'S**

Solidus temperature = (575.9 ± 3)°C

Liquidus temperature = (878.8 ± 3)°C

## **MECHANICAL PROPERTIES**

### **HEAT TREATMENT CONDITION F: (minimum values)**

| Property              | Unit | Temperature |       |       |       |       |       |
|-----------------------|------|-------------|-------|-------|-------|-------|-------|
|                       |      | 20°C        | 100°C | 150°C | 200°C | 250°C | 300°C |
| Tensile strength, Rm  | MPa  | 165         |       | 128   |       |       |       |
| Yield strength, Rp0,2 | MPa  | 95          |       | 76    |       |       |       |
| Elongation, A5        | %    | 2.5         |       | 8.4   |       |       |       |
| Young's modulus, E    | GPa  | 85          |       | 76    |       |       |       |
| Hardness              | HV30 | 65          | -     | -     | -     | -     | -     |

### **EXEMPLARY VALUES IN CONDITION F: (mean values)**

|                        |     |       |       |       |       |       |       |
|------------------------|-----|-------|-------|-------|-------|-------|-------|
| Shear modulus, G       | GPa | 36    | 35    | 35    | 34    | 33    | 33    |
| Poisson's ratio, $\mu$ |     | 0.275 | 0.278 | 0.280 | 0.282 | 0.284 | 0.284 |

### **FATIGUE STRENGTH IN CONDITION F: (P50% rotary bending values for 5x10<sup>7</sup> cycles)**

| Property    | Unit | Temperature |       |       |       |       |       |
|-------------|------|-------------|-------|-------|-------|-------|-------|
|             |      | 20°C        | 100°C | 150°C | 200°C | 250°C | 300°C |
| $\sigma$ bW | MPa  |             |       |       |       |       |       |

## **MECHANICAL PROPERTIES**

### **HEAT TREATMENT CONDITION O: (minimum values)**

| Property              | Unit | Temperature |       |       |       |       |       |
|-----------------------|------|-------------|-------|-------|-------|-------|-------|
|                       |      | 20°C        | 100°C | 150°C | 200°C | 250°C | 300°C |
| Tensile strength, Rm  | MPa  | 140         |       |       |       |       |       |
| Yield strength, Rp0,2 | MPa  | 80          |       |       |       |       |       |
| Elongation, A5        | %    | 2.0         |       |       |       |       |       |
| Young's modulus, E    | GPa  | 80          |       |       |       |       |       |
| Hardness              | HV30 | 58          | -     | -     | -     | -     | -     |

### **EXEMPLARY VALUES IN CONDITION O: (mean values)**

|                        |     |  |  |  |  |  |  |
|------------------------|-----|--|--|--|--|--|--|
| Shear modulus, G       | GPa |  |  |  |  |  |  |
| Poisson's ratio, $\mu$ |     |  |  |  |  |  |  |

### **FATIGUE STRENGTH IN CONDITION O: (P50% rotary bending values for $5 \times 10^7$ cycles)**

| Property      | Unit | Temperature |       |       |       |       |       |
|---------------|------|-------------|-------|-------|-------|-------|-------|
|               |      | 20°C        | 100°C | 150°C | 200°C | 250°C | 300°C |
| $\sigma_{bW}$ | MPa  |             |       |       |       |       |       |