

## Copper-zinc casting alloy **ABG** alloy 2180

**ABG** is a construction and sliding material with a very high static load capacity. Due to its moderate sliding properties, only low sliding speeds – but high surface pressures – are permissible. A hard sliding partner is necessary.

|                 |                   |
|-----------------|-------------------|
| ZOLLERN brand   | ABG               |
| EN designation  | CuZn25Al5Mn4Fe3-C |
| EN material no: | CC762S            |

EN 1982, ASTM B584, BS1400, SA430B

### // ISO / national designations

|     |             |
|-----|-------------|
| DIN | G-CuZn25Al5 |
| DIN | 2.0598      |
| USA | C86300      |
| GB  | HTB3        |
| F   | ≈ U – Z19A6 |

≈ (substantial coherence)

### // Composition (mass fraction in %) EN 1982

| Cu          | Al*       | Fe*       | Ni*      | Mn        |
|-------------|-----------|-----------|----------|-----------|
| 60.0 – 67.0 | 3.0 – 7.0 | 1.5 – 4.0 | max. 3.0 | 2.5 – 5.0 |
| Pb          | Si        | Sn        | Zn*      | P         |
| max. 0.2    | max. 0.1  | max. 0.2  | Rest     | max. 0.03 |

\* ASTM B584 Al 5.0 – 7.5 % Fe 2.0 – 4.0 % Ni max 1% Zn 22 – 28 %

\* BS 1400 HTB3 Al 3.0 – 6.0 % Fe 1.5 – 3.2 % Ni max 1 %

### // Strength properties at room temperature

(minimum values)

|  | R <sub>m</sub><br>N/mm <sup>2</sup> | R <sub>p0.2</sub><br>N/mm <sup>2</sup> | A <sub>5</sub><br>% | HB  |
|--|-------------------------------------|--|---------------------|-----|
| [1] EN 1982<br>[2] ASTM B584, R <sub>p0.5</sub> *<br>[3] BS 1400 |                                     |  |                     |     |
| [1] Sand casting   | 750                                 | 450                                    | 8                   | 180 |
| [1] Mask mould casting   | 750                                 | 450                                    | 8                   | 180 |
| [1] Centrifugal casting  | 750                                 | 480                                    | 5                   | 190 |
| [2] Sand casting   | 758                                 | 414*                                   | 12                  | -   |
| [3] Sand casting   | 740                                 | 400                                    | 11                  | -   |
| [3] Centrifugal casting  | 740                                 | 400                                    | 13                  | -   |

### // Strength properties

at elevated temperatures (reference values)

| Temperature      | °C                                  | 20  | 150 | 200 | 250 | 300 |
|------------------|-------------------------------------|-----|-----|-----|-----|-----|
| Tensile strength | R <sub>m</sub> N/mm <sup>2</sup>    | 750 | 660 | 626 | 608 | 590 |
| 0.2% limit       | R <sub>p0.2</sub> N/mm <sup>2</sup> | 450 | 438 | 433 | 428 | 422 |
| Elongation       | A <sub>5</sub> %                    | 8   | 16  | 18  | 21  | 23  |

### // Physical properties (reference values)

|  |  |
|--|--|
| Density at 20°C                                    | 8.2 kg/dm <sup>3</sup>                 |
| Melting temperature/range                          | 900 – 925°C                            |
| Thermal conductivity at 20°C                       | 0.50 W/cm °C                           |
| Electrical conductivity at 20°C                    | 5 – 8 MS/m<br>8 – 14 % IACS            |
| Electrical resistance at 20°C                      | 0.125 – 0.20 Ω mm <sup>2</sup> /m      |
| Coefficient of linear expansion from 20°C to 200°C | 18 × 10 <sup>-6</sup> °C <sup>-1</sup> |
| Shrinkage  | approx. 1.8 – 2.3 %                    |
| Young's modulus                                    | 110 KN/mm <sup>2</sup>                 |
| Permeability                                       | < 1.1                                  |

### // Dynamic strength values

at room temperature (reference values)

|   |                       |
|---|-----------------------|
| Bending fatigue strength R <sub>bw</sub> at 10 <sup>8</sup> load cycles | 150 N/mm <sup>2</sup> |
| Notched impact energy (ISO - V/KV)                                      | 30 joules             |

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### Areas of application

**ABG** is used for structurally highly loaded construction and sliding parts. Its very good strength values allow high surface pressures. The material is only suitable for low sliding speeds. **ABG** is used for

- Bearing bushes in excavator arms
- Bucket loaders and other construction machinery
- Slide and guide rails
- Slow-running worm gears

### Machinability

**ABG** is easy to machine. The machinability index is approx. 30 (CuZn39Pb3 = 100). Mechanical polishing is possible, electrochemical less so.

**Relaxation annealing** approx. 350 – 480°C

**Soft soldering** Not suitable

**Brazing** Not suitable

**Welding** Inert gas-shielded arc welding is possible. However, smoke is generated due to the evaporation of zinc (smoke extraction). Analytically identical or similar filler materials are not available. Possible filler material e.g. S-CuAl8Ni2 or CuSn8 = CF 453K

**Galvanisability** average

