

# Wieland-M57

CuZn42 | Low leaded brass

## Material designation

|     |                  |
|-----|------------------|
| EN  | CuZn42<br>CW510L |
| UNS | not standardized |

## Chemical composition\*

|    |         |
|----|---------|
| Cu | 58 %    |
| Zn | balance |
| Pb | 0.2 %   |

\*Reference values in % by weight

## Physical properties\*

|  |                     |      |
|--|---------------------|------|
| Electrical conductivity                  | MS/m                | 13.9 |
|  | %IACS               | 24   |
| Thermal conductivity                     | W/(m·K)             | 139  |
| Thermal expansion coefficient (0–300 °C) | 10 <sup>-6</sup> /K | 21.7 |
| Density                                  | g/cm <sup>3</sup>   | 8.41 |
| Modulus of elasticity                    | GPa                 | 107  |

\*Reference values at room temperature

## Corrosion resistance

Machining brass is generally quite resistant against organic substances as well as neutral or alkaline compounds.

Stress corrosion cracking should be taken into account, especially in an ammoniacal atmosphere and whilst under mechanical stress.

Dezincification in warm, acidic waters should also be taken into consideration.

## Product standards

|      |                      |
|------|----------------------|
| Rod  | EN 12164<br>EN 12165 |
| Wire | EN 12166             |

## Material properties and typical applications

**Wieland-M57** is a low leaded material which is however quite suitable for machining due to its structural constitution. M57 can be therefore used as a cost-effective replacement for conventional lead-containing machining brass provided that it must not meet high requirements as regards mechanical properties and corrosion resistance.

Material accepted for products in contact with drinking water as per 4 MS positive list.

## Types of delivery

The BU Extruded Products supplies bars, wire, sections and tubes. Please get in touch with your contact person regarding the available delivery forms, dimensions and tempers.

## Fabrication properties

### Forming

|                                   |           |
|-----------------------------------|-----------|
| Machinability (CuZn39Pb3 = 100 %) | 70 %      |
| Capacity for being cold worked    | poor      |
| Capacity for being hot worked     | excellent |

### Surface treatment

|                |           |
|----------------|-----------|
| Polishing      |           |
| mechanical     | good      |
| electrolytic   | poor      |
| Electroplating | excellent |

## Joining

|                                |           |
|--------------------------------|-----------|
| Resistance welding (butt weld) | fair      |
| Inert gas shielded arc welding | fair      |
| Gas welding                    | fair      |
| Hard soldering                 | excellent |
| Soft soldering                 | excellent |

## Heat treatment

|                          |                     |
|--------------------------|---------------------|
| Melting range            | 870–900 °C          |
| Hot working              | 650–750 °C          |
| Soft annealing           | 450–550 °C<br>1–3 h |
| Thermal stress relieving | 250–350 °C<br>1–3 h |

## Handelsmarken



Further information is provided in the brochures on Ecomerica and on drinking water.

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## Mechanical properties according to EN

| Round rods/polygonal rods |          |    |                    |    |   |                           |      |              |       |      |          | acc. to EN 12164 |  |
|---------------------------|----------|----|--------------------|----|---|---------------------------|------|--------------|-------|------|----------|------------------|--|
| Temper                    | Diameter |    | Width across flats |    | Tensile strength $R_m$                                    | Yield strength $R_{p0.2}$ |      | Elongation % |       |      | Hardness |                  |  |
|                           | mm       |    | mm                 |    | MPa   | MPa                       |      | A100         | A11.3 | A    | HB       |                  |  |
|                           | from     | to | from               | to | min.  | min.                      | max. | min.         | min.  | min. | min.     | max.             |  |
| M                         | all      |    | all                |    | as manufactured – without specified mechanical properties |                           |      |              |       |      |          |                  |  |
| R360                      | 6        | 80 | 5                  | 60 | 360   | –                         | 320  | –            | 15    | 20   | –        | –                |  |
| H090                      | 6        | 80 | 5                  | 60 | –   | –                         | –    | –            | –     | –    | 90       | 125              |  |
| R430                      | 2        | 40 | 2                  | 35 | 430   | –                         | –    | 6            | 8     | 10   | –        | –                |  |
| H110                      | 2        | 40 | 2                  | 35 | –   | –                         | –    | –            | –     | –    | 110      | 160              |  |
| R500                      | 2        | 14 | 2                  | 10 | 500   | –                         | –    | –            | 3     | 5    | –        | –                |  |
| H135                      | 2        | 14 | 2                  | 10 | –   | –                         | –    | –            | –     | –    | 135      | –                |  |

| Round wires |          |    |      |    |   |                           |      |              |       |      |          | acc. to EN 12166 |  |
|-------------|----------|----|------|----|---|---------------------------|------|--------------|-------|------|----------|------------------|--|
| Temper      | Diameter |    |      |    | Tensile strength $R_m$                                    | Yield strength $R_{p0.2}$ |      | Elongation % |       |      | Hardness |                  |  |
|             | mm       |    |      |    | MPa   | MPa                       |      | A100         | A11.3 | A    | HB       |                  |  |
|             | from     | to | from | to | min.  | min.                      | max. | min.         | min.  | min. | min.     | max.             |  |
| M           | all      |    |      |    | as manufactured – without specified mechanical properties |                           |      |              |       |      |          |                  |  |
| R360        | 6        | –  | –    | 20 | 360   | –                         | 320  | –            | 15    | 20   | –        | –                |  |
| H095        | 6        | –  | –    | 20 | –   | –                         | –    | –            | –     | –    | 95       | 130              |  |
| R430        | 0.5      | –  | –    | 14 | 430   | –                         | –    | 6            | 8     | 10   | –        | –                |  |
| H115        | 1.5      | –  | –    | 14 | –   | –                         | –    | –            | –     | –    | 115      | 170              |  |
| R500        | 0.5      | –  | –    | 8  | 500   | –                         | –    | 2            | 5     | –    | –        | –                |  |
| H145        | 1.5      | –  | –    | 8  | –   | –                         | –    | –            | –     | –    | 145      | –                |  |