

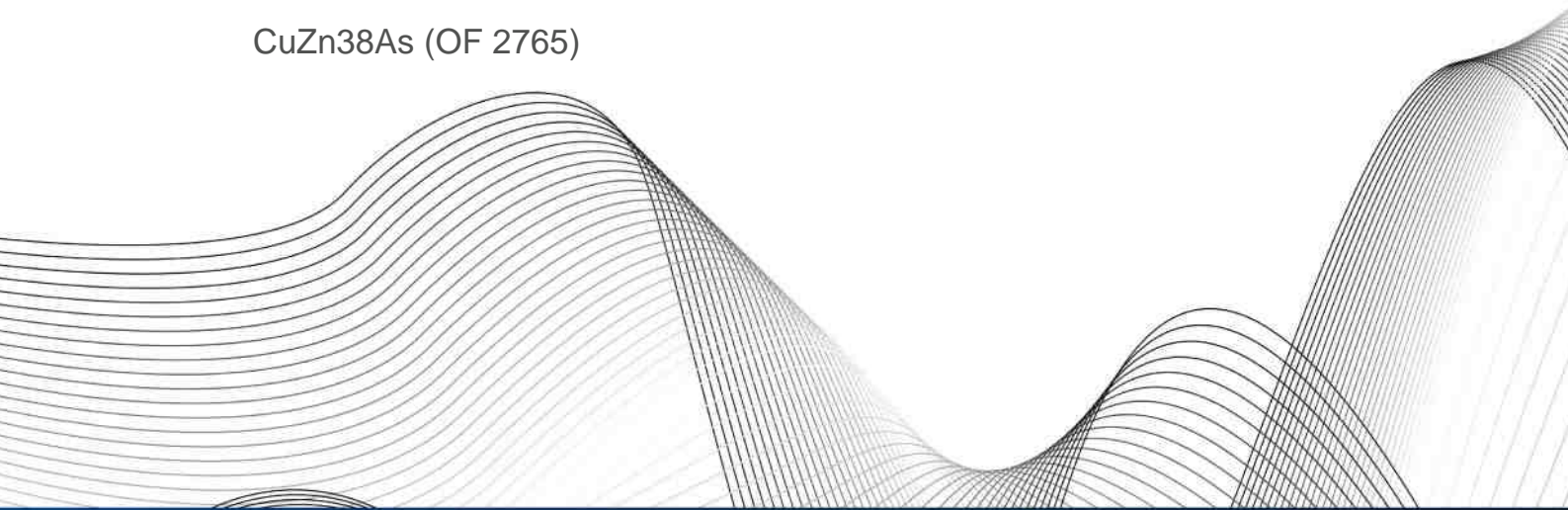


OTTO FUCHS  
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn38As (OF 2765)





|      | Cu   | Zn   | Pb  | Sn  | Fe  | Mn   | Ni  | Al   | Si | As   | Co | Cr | Others     |
|------|------|------|-----|-----|-----|------|-----|------|----|------|----|----|------------|
| min. | 61.5 | Rem. | -   | -   | -   | -    | -   | -    | -  | 0.02 | -  | -  | -          |
| max. | 63.5 | -    | 0.2 | 0.1 | 0.1 | 0.1* | 0.3 | 0.05 | -  | 0.15 | -  | -  | 0.2 incl.* |

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## Applications

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CuZn38As in tailored heat treated condition is highly suitable for use in media with enhanced risk of dezincification.

CuZn38As is suitable for use in drinking water. The German Federal Office for the Environment enlists CuZn31Si3P for products which are used in drinking water (category B: fittings and connectors, pumps and other devices; category C: components whose surface is in contact with drinking water at less than 10% of the total surface).

Examples of application:

Parts with persistence against dezincification  
Fittings and connecting tubes  
Parts for pumps  
Parts for mechanical apparatus  
Parts for heating installations

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## Physical properties

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At room temperature

|                                  |         |                     |
|----------------------------------|---------|---------------------|
| Density                          | 8.4     | g/cm <sup>3</sup>   |
| Electrical conductivity          | 14.7    | MS/m                |
|                                  | 25.4    | % I.A.C.S           |
| Heat conductivity                | 114     | W/(m*K)             |
| Heat capacity                    | 377     | J/(kg*K)            |
| Coefficient of thermal expansion | 21.7    | 10 <sup>-6</sup> /K |
| Young's modulus                  | 105     | GPa                 |
| Melting range                    | 850-900 | °C                  |

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## Microstructures

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CuZn38As in heat-treated conditions provides a homogeneous microstructure with a matrix of  $\alpha$ -brass. Some remnants of  $\beta$ -brass could be present.



## Consignment and measurements

### Strength conditions

| Spec./<br>DIN EN                      | Condition | Yield strength<br>R <sub>p0.2</sub> [MPa] | Tensile<br>strength R <sub>m</sub><br>[MPa] | Elongation<br>at break A<br>[%] | Brinell-<br>Hardness<br>HBW 2.5/62.5 |
|---------------------------------------|-----------|-------------------------------------------|---------------------------------------------|---------------------------------|--------------------------------------|
| 12163/12164/<br>12165/12167/<br>12168 | M         | **                                        | **                                          | **                              | **                                   |
| 12163/12164/<br>12168                 | R280      | ≤200                                      | ≥280                                        | ≥30                             | /                                    |
| 12163/12164/<br>12168                 | R320      | ≥200                                      | ≥320                                        | ≥20                             | /                                    |
| 12163/12164/<br>12168                 | R400      | ≥250                                      | ≥400                                        | ≥8                              | /                                    |
| 12163/12164/<br>12168                 | H070      | /                                         | /                                           | /                               | 70-110                               |
| 12165                                 |           | /                                         | /                                           | /                               | 70-150                               |
| 12163/12164/<br>12168                 | H090      | /                                         | /                                           | /                               | 90-135                               |
| 12163/12164/<br>12168                 | H105      | /                                         | /                                           | /                               | ≥105                                 |

DIN EN 12163:  
Bars, general purpose

DIN EN 12164:  
Bars for machining

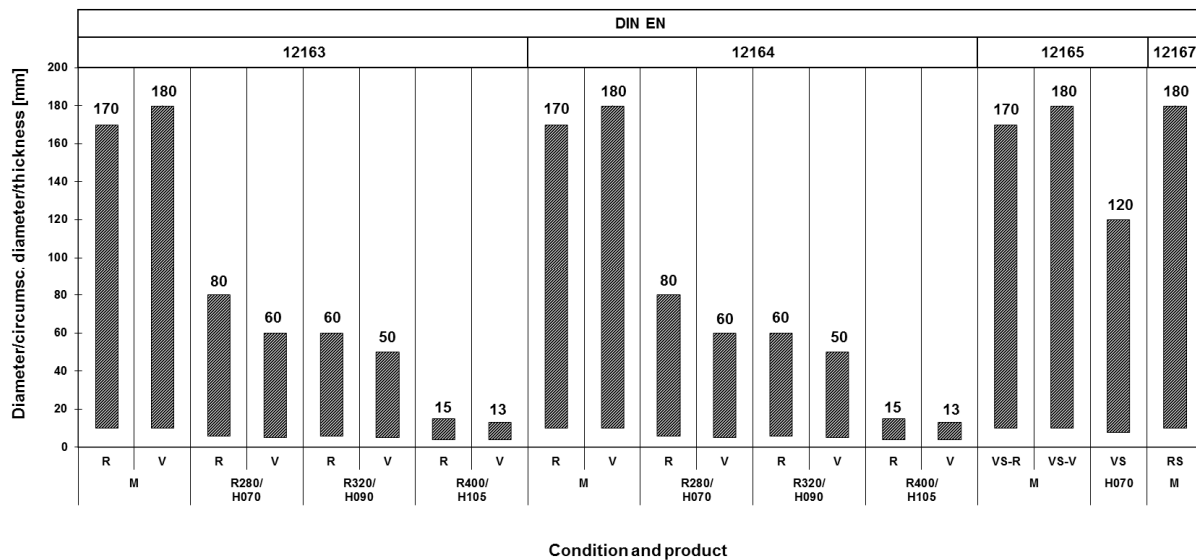
DIN EN 12165:  
Pre-material for forgings

DIN EN 12167:  
Profiles, rectangular bars

DIN EN 12168:  
Hollow tubes for machining

\*\* Condition M = without specified mechanical properties-as manufactured  
/ No requirements in standard or not applicable

### Specified dimensions for bars, pre-material for forging and forgings

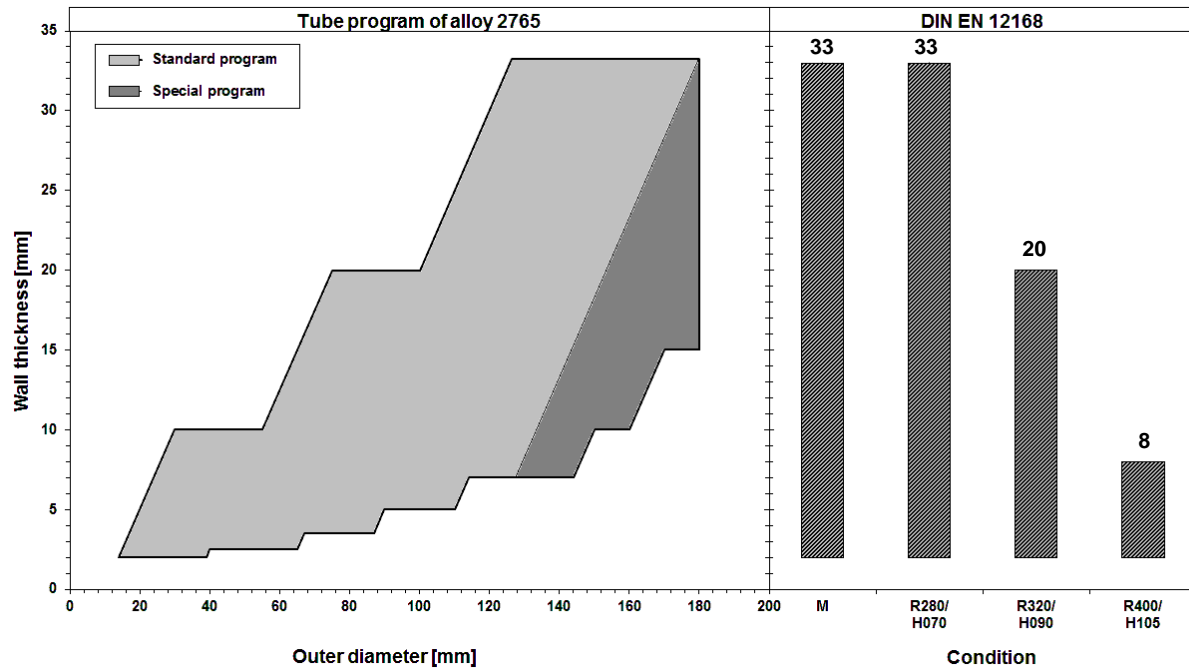


R/V Round/Polyhedral bar  
VS-R/V Pre-material for forging round/polygonal  
RS Rectangular bar

Profiles and rectangular bars can be delivered up to 180 mm in extruded and up to 130 mm in cold drawn condition. Pre-material for forging and forgings is dependent upon each individual case.



## Specified dimensions for hollow bars and round tubes



Further dimensions for hollow bars and round tubes are available on request.

## Other consignments

Rods and tubes in other strength and hardness conditions, and dimensions are available on request.

| Processing                        |              | Heat treatment                                                                                                                                                                                                                                                                            |           |
|-----------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Shaping                           |              | Soft annealing                                                                                                                                                                                                                                                                            | 450-550°C |
| Machinability<br>(CuZn39Pb3=100%) | average (50) | Stress relieving                                                                                                                                                                                                                                                                          | 200-250°C |
| Cold working                      | good         | <b>Special notes and remarks</b>                                                                                                                                                                                                                                                          |           |
| Hot working                       | average      |                                                                                                                                                                                                                                                                                           |           |
| Hot working temperature           | 600-800°C    | Forming operations or heat treatment above 550°C may reduce the resistance against dezincification. Consultation is recommended. Forgings with forging temperature above 550°C should be heat treated at 500 - 550°C after forging for improvement of resistance against dezincification. |           |
| Connecting                        |              | There is a risk of stress corrosion cracking (SCC) in case of concurrent presence of mechanical stress and corrosive media (in particular ammoniac atmosphere).                                                                                                                           |           |
| Resistance welding                | good         |                                                                                                                                                                                                                                                                                           |           |
| Shielded welding                  | average      |                                                                                                                                                                                                                                                                                           |           |
| Brazing                           | very good    |                                                                                                                                                                                                                                                                                           |           |
| Soldering                         | very good    |                                                                                                                                                                                                                                                                                           |           |
| Surface treatment                 |              |                                                                                                                                                                                                                                                                                           |           |
| Mechanical polishing              | very good    |                                                                                                                                                                                                                                                                                           |           |
| Electrolytic polishing            | good         |                                                                                                                                                                                                                                                                                           |           |
| Galvanisation                     | very good    |                                                                                                                                                                                                                                                                                           |           |
| Tin coating                       | -            |                                                                                                                                                                                                                                                                                           |           |



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