

Technical Specifications

# CW724R

| Alloy     |            |
|-----------|------------|
| EN Symbol | CuZn21Si3P |
| EN No     | CW724R     |
| ASTM      | C69300     |
| DIN       | -          |

| CW724R Chemical Composition |    |     |     |     |      |      |     |      |     |       |
|-----------------------------|----|-----|-----|-----|------|------|-----|------|-----|-------|
|                             | Cu | Pb  | Sn  | Fe  | Mn   | P    | Ni  | Al   | Si  | Zn    |
| Min                         | 75 | -   | -   | -   | -    | 0,02 | -   | -    | 2,7 | -     |
| Max                         | 77 | 0,1 | 0,3 | 0,3 | 0,05 | 0,1  | 0,2 | 0,05 | 3,5 | Kalan |

### Applications and Features

Due to its good corrosion resistance it is especially used in potable water.

It is a high strength alloy.

It is suitable to potable water directive. It is on the list of 4MS Positive List. To CW724R 4MS and UBA material product group is B-D.

### Production Standard

|                                                   |          |
|---------------------------------------------------|----------|
| Solid Bar for Machining (Chamfered)               | EN 12164 |
| Solid Bar for Forging                             | EN 12165 |
| Hollow Bar for Machining (Chamfered upon request) | EN 12168 |
| Profile for Machining                             | EN 12167 |
| *Please contact us for EN 12168 standard.         |          |

### Heat Treatment

|                            |              |             |
|----------------------------|--------------|-------------|
| Annealing                  | 550 – 700 °C | 1 – 2 hours |
| Stress Relieving Annealing | 200 – 320 °C | 1 – 2 hours |

### Technical Properties

|                                  |                   |            |
|----------------------------------|-------------------|------------|
| Structure                        |                   | kappa+gama |
| Density                          | g/cm <sup>3</sup> | 8,3        |
| Coefficient of Thermal Expansion | 10-6/K            | 00019,6    |
| Electrical Conductivity (%)      | IACS              | 00007,8    |
| Thermal Conductivity             | W/(m K)           | 00033      |
| Elastic Modulus                  | GPa               | 00106      |
| Melting Temperature              | °C                | 870-930    |

### Machining Properties

|                          |           |
|--------------------------|-----------|
| Machinability            | Good      |
| Hot Forming (650-760 °C) | Very Good |
| Cold Forming             | Medium    |

### Corrosion Resistance

Very Good Corrosion Resistance

## EN 12164:2024 - Free Machining Rod Standard Mechanical Properties

| Material Condition | Diameter |      | Parallel Surface (mm) |      | Tensile Strength Rm | 0,2 % Yield Strength Rp 0,2 |     | Elongation  |           |       | Hardness |     |
|--------------------|----------|------|-----------------------|------|---------------------|-----------------------------|-----|-------------|-----------|-------|----------|-----|
|                    | (mm)     |      | (mm)                  |      | N/mm2 (MPa)         | N/mm2 (MPa)                 |     | A100 mm (%) | A11,3 (%) | A (%) | (HBW)    |     |
|                    | Above    | Inc. | Abv.                  | Inc. | Min                 | Min                         | Max | Min         | Min       | Min   | Min      | max |
| M                  | All      |      | All                   |      | As produced         |                             |     |             |           |       |          |     |
| R280               | 10       | 60   | 10                    | 55   | 280                 | -                           | 200 | -           | 25        | 30    | -        | -   |
| H070               | 10       | 60   | 10                    | 55   | -                   | -                           | -   | -           | -         | -     | 70       | 110 |
| R320               | 10       | 60   | 10                    | 50   | 320                 | 200                         | -   | -           | 15        | 20    | -        | -   |
| H90                | 10       | 60   | 10                    | 50   | -                   | -                           | -   | -           | -         | -     | 90       | 135 |
| R400               | 10       | 15   | 10                    | 13   | 400                 | 250                         | -   | -           | 5         | 8     | -        | -   |
| H105               | 10       | 15   | 10                    | 13   | -                   | -                           | -   | -           | -         | -     | 105      | -   |

\*Please contact us for R280 condition.

## EN 12164:2024 - Free Machining Hollow Rod Standard Mechanical Properties

| Material Condition | Diameter |      | Parallel Surface(mm) |      | Tensile Strength Rm | 0,2 % Yield Strength Rp 0,2 |     | Elongation  |           |       | Hardness |     |
|--------------------|----------|------|----------------------|------|---------------------|-----------------------------|-----|-------------|-----------|-------|----------|-----|
|                    | (mm)     |      | (mm)                 |      | N/mm2 (MPa)         | N/mm2 (MPa)                 |     | A100 mm (%) | A11,3 (%) | A (%) | (HBW)    |     |
|                    | Abv.     | Inc. | Abv.                 | Inc. | Min                 | Min                         | Max | Min         | Min       | Min   | Min      | max |
| M                  | All      |      | All                  |      | As produced         |                             |     |             |           |       |          |     |
| R500               | 18       | 60   | 18                   | 55   | 500                 | -                           | 450 | -           | -         | 15    | -        | -   |
| H130               | 18       | 60   | 18                   | 55   | -                   | -                           | -   | -           | -         | -     | 130      | 180 |
| R600               | 18       | 40   | 18                   | 40   | 600                 | 300                         | -   | -           | -         | 12    | -        | -   |
| H150               | 18       | 40   | 18                   | 40   | -                   | -                           | -   | -           | -         | -     | 150      | 220 |
| R670               | -        | -    | -                    | -    | 670                 | 400                         | -   | 8           | 9         | 10    | -        | -   |
| H170               | -        | -    | -                    | -    | -                   | -                           | -   | -           | -         | -     | 170      | -   |

\*Please contact us for request about mechanic conditions.

## EN 12165:2024 - Forging Stock Standard Mechanical Properties

| Material Condition | Diameter (mm) |           | Hardness    |     |
|--------------------|---------------|-----------|-------------|-----|
|                    | (mm)          |           | (HBW)       |     |
|                    | Above         | Including | Min         | max |
| M                  | All           |           | As produced |     |
| H130               | 18            | 80        | 130         | 220 |

\* Mechanical properties are referenced according to the EN 12164:2024 standard.

\* Please contact us for request about mechanic conditions.

## EN 12168:2024 - Free Machining Hollow Rod Standard Mechanical Properties

| Material Condition | Wall Thickness |      | Tensile Strength Rm | 0,2 % Yield Strength Rp 0,2 |     | Elongation | Hardness |     |
|--------------------|----------------|------|---------------------|-----------------------------|-----|------------|----------|-----|
|                    | (mm)           |      | N/mm2 (MPa)         | N/mm2 (MPa)                 |     | A (%)      | (HBW)    |     |
|                    | Above          | Inc. | Min                 | Min                         | Max | Min        | Min      | Min |
| M                  | All            |      | As produced         |                             |     |            |          |     |
| R500               | 3              | 20   | 500                 | -                           | 450 | 15         | -        | -   |
| H130               | 3              | 20   | -                   | -                           | -   | -          | 130      | 180 |
| R600               | 3              | 20   | 600                 | 350                         | -   | 12         | -        | -   |
| H150               | 3              | 20   | -                   | -                           | -   | -          | 150      | 220 |
| R650               | 3              | 7    | 650                 | 400                         | -   | 10         | -        | -   |
| H170               | 3              | 7    | -                   | -                           | -   | -          | 170      | -   |

\* Hollow tubes are produced in M condition. Please contact us for special requests.

## EN 12164:2024 - Free Machining Rod Standard Dimensional Tolerances

| Dimensional tolerances of the round bar<br>(including deviation from roundness) |                        |                |         |         | Dimensional tolerances of the width between<br>parallel surfaces of regular polygon bars |
|---------------------------------------------------------------------------------|------------------------|----------------|---------|---------|------------------------------------------------------------------------------------------|
| Nominal Diameter (mm)                                                           |                        | Tolerance (mm) |         |         |                                                                                          |
| Above                                                                           | Up to and including... | Class A        | Class B | Class C | Tolerance(mm)                                                                            |
| 2                                                                               | 3                      | -0,04          | -0,025  | -0,015  | -0,06                                                                                    |
| 3                                                                               | 6                      | -0,05          | -0,03   | -0,020  | -0,08                                                                                    |
| 6                                                                               | 10                     | -0,06          | -0,036  | -0,025  | -0,09                                                                                    |
| 10                                                                              | 18                     | -0,07          | -0,043  | -       | -0,11                                                                                    |
| 18                                                                              | 30                     | -0,08          | -0,052  | -       | -0,13                                                                                    |
| 30                                                                              | 50                     | -0,16          | -       | -       | -0,016                                                                                   |
| 50                                                                              | 55                     | -0,19          | -       | -       | -0,19                                                                                    |

\* Please contact us for products to diameter below 18mm.

\* Please contact us for Class C tolerances.

## EN 12164:2024 - Free Machining Rod Length Standard

| Length tolerance (mm) for bars in nominal lengths   |                        |                               |                   |
|-----------------------------------------------------|------------------------|-------------------------------|-------------------|
| Nominal diameter or width between parallel surfaces |                        | Preferred (Available) Lengths | Length Tolerances |
| Above                                               | Up to and including... |                               |                   |
| 2                                                   | 30                     | 3000 or 4000                  | ±0,50             |
| 30                                                  | 50                     | 3000 or 4000                  | ±0,100            |
| 50                                                  | 60                     | 3000                          | ±0,100            |

## EN 12165:2024 - Round Forging Stock Diameter Tolerance

| Nominal Diameter(mm) |                     | Tolerances(mm) |         |
|----------------------|---------------------|----------------|---------|
| Above                | Up to and including | Class A        | Class B |
| 10                   | 18                  | ±0,25          | ±0,14   |
| 18                   | 30                  | ±0,30          | ±0,17   |
| 30                   | 50                  | ±0,60          | ±0,20   |
| 50                   | 65                  | ±0,70          | ±0,37   |
| 65                   | 80                  | ±0,70          | -       |
| 80                   | 110                 | ±2             | -       |

\* Please contact us for products to diameter below 18mm.

\* For forged stocks, length and length tolerance are determined mutually. If no request is specified, the manufacturer will decide on the length.

## EN 12168:2024 - Free Machining Hollow Rod Standard Dimensional Tolerances

| Outer diameter or width between parallel surfaces tolerances      |           |                |         |         | Wall Thickness Tolerance    |      | Wall Thickness Tolerance (%) | Bore Diameter Tolerances   |      |                             |         |
|-------------------------------------------------------------------|-----------|----------------|---------|---------|-----------------------------|------|------------------------------|----------------------------|------|-----------------------------|---------|
| Nominal outer diameter or distance between parallel surfaces (mm) |           | Tolerances(mm) |         |         | Nominal Wall Thickness (mm) |      |                              | Nominal Bore Diameter (mm) |      | Bore Diameter Tolerance(mm) |         |
| Above                                                             | Including | Class A        | Class B | Class C | Above                       | Inc. |                              | Abv.                       | Inc. | Class A                     | Class B |
| 17                                                                | 18        | -              | -0,18   | -0,11   | 2a                          | 3    | ±12*Wall Thickness           | 10                         | 18   | ±35                         | ±14     |
| 18                                                                | 30        | -              | -0,21   | -0,13   | 3                           | 6    | ±10* Wall Thickness          | 18                         | 30   | ±42                         | ±17     |
| 30                                                                | 50        | ±0,31          | -0,25   | -0,16   | 6                           | 10   | ±9* Wall Thickness           | 30                         | 50   | ±80                         | ±20     |
| 50                                                                | 80        | ±0,60          | -0,46   | -0,30   | 10                          | -    | ±8* Wall Thickness           | 50                         | 70   | ±95                         | ±37     |

\*Please contact us for hollow tubes.

## EN 12168:2024 - Free Machining Hollow Rod Length Standard

| Length Tolerance (mm) for Bars in Nominal Lengths   |                        |                               |                   |
|-----------------------------------------------------|------------------------|-------------------------------|-------------------|
| Nominal Diameter or Width Between Parallel Surfaces |                        | Preferred (Available) Lengths | Length Tolerances |
| Above                                               | Up to and including... |                               |                   |
| 18                                                  | 30                     | 2700 - 4000                   | ±0,50             |
| 30                                                  | 50                     | 2500 - 3500                   | ±0,100            |
| 50                                                  | 80                     | 2000 - 3000                   | ±0,100            |

## Chamfer

| Determining Shaped End Dimensions (mm)                     |                        |                              |      |                                |      |
|------------------------------------------------------------|------------------------|------------------------------|------|--------------------------------|------|
| Nominal Diameter D or Distance Between Parallel Surfaces W |                        | Figure 1 – Chamfer, Length L |      | Figure 2 – Sharpened, Length L |      |
| Above                                                      | Up to and including... | Min.                         | Max. | Min.                           | Max. |
| 5                                                          | 10                     | 0,2                          | 1,5  | 2,0                            | 7,0  |
| 10                                                         | 20                     | 0,2                          | 2,0  | 3,0                            | 10,0 |
| 20                                                         | 30                     | 0,2                          | 3,0  | 4,0                            | 12,0 |

\*Chamfering is done to remove burrs.

\*Tapering is done for easy feeding of bars into automatic feeding devices.

\*Please contact us for chamfering on products over 50mm.

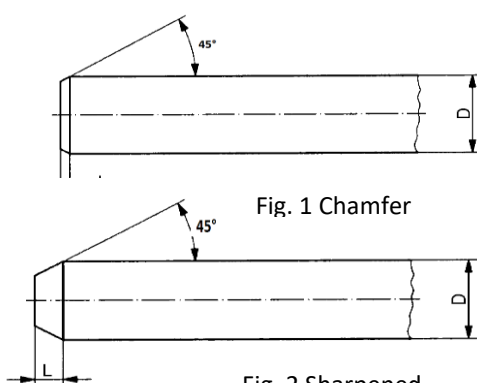


Fig. 1 Chamfer

Fig. 2 Sharpened

## Stress Relieving

According to the EN 12164 standard, stress relieving annealing is not performed unless a special request is specified. Stress relieving annealing is performed on all products that have undergone cold forming according to the EN 12168 standard.

## Packing

After chamfering, all products according to the EN 12164 and EN 12168 standards are packaged in thick nylon.

Bundles range from 500 to 1000 kg.

If there is a special request, the products are shipped in wooden crates.