



bercoweld®

WIRE SOLUTIONS

FOR BRAZING OF
STEEL AND WELDING
OF COPPER ALLOYS

bedra
intelligent wires



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bedra and copper

Added value for our customers. That is our claim. As early as 1889, it was a matter of course for Carl Berkenhoff to offer its customers more than others. Today, customers worldwide appreciate bedra as a reliable partner for sustainable solutions in the field of high-tech precision wires made of copper and copper-based alloys for electrical discharge machining, brazing and welding, electronics applications and many others. We listen to our customers, understand their needs and offer them solutions tailored to them. More than 100 alloys are impressive proof of our know-how. We have developed the bercoweld® series for brazing of steel and welding of copper and copper alloys. Our complex range of wire electrodes provides the right product for every application. Whether you prefer MIG, MAG, TIG, laser, plasma or arc spraying processes: The bercoweld® range is as diverse as your applications. This is one reason why renowned companies from the automotive industry, plant construction, and the offshore and onshore sectors rely on bercoweld as a fundamental component of an innovative joining technology.



Tradition

We have been producing wire for more than 130 years. That's what we know, that's our core competence. We draw our skills, knowledge and know-how from this experience.

Research and Development

The engineers in our research and development department are close to the market and in close contact with our customers. This is how our innovations and new products are created.



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Foundry

Our own foundry is our unique selling point. This enables us to respond to requests on the market and to produce alloys for our customers according to their specifications.



Competence

Know-how is one of the keys to success. We are always expanding our knowledge and drawing on our many years of experience. For new areas we expand our competence team.



Quality

We are one of the few global suppliers to offer all services from a single source. This allows us to trace our processes back 100% and thus ensure consistently high quality.

| | Standard | Chemical Composition (Reference values %) | | | | | | | | | | |
|-------------------|---|---|-----------|---------|-----------|-----------|-----------|-------------|-----------|-----------|---------|--------------------|
| | | Si | Fe | Al | Mn | Sn | P | Ni | Cu | Others | | |
| Low alloyed | bercoweld® K3 (SF-Cu) | CuZ (CuP) (ISO 24373) | | | | | | | 0.05-0.07 | | Balance | |
| | bercoweld® K5 (CuSn1) | Cu1898 (ISO 24373) SG-CuSn (1733) ERCu (AWS A5.7-2007) | 0.15-0.25 | | | 0.15-0.3 | 0.75-0.9 | 0.005-0.02 | | | Balance | ≤0.5 |
| | bercoweld® S3 (CuSi3Mn) | Cu6560 (ISO 24373) SG-CuSi3 (DIN 1733) ERCuSi-A (AWS A5.7-2007) | 2.8-2.95 | | | 0.75-0.95 | | | | | Balance | ≤0.5 |
| | bercoweld® S2 (Comas) | Cu6511 (ISO 24373) | 1.7-1.9 | | | 0.9-1.1 | 0.17-0.25 | 0.008-0.012 | | | Balance | |
| | bercoweld® K9 (CuAg1) | Cu1897 (ISO 24373) SG-CuAg (DIN 1733) | | | | 0.04-0.1 | | 0.01-0.05 | | | Balance | ≤0.2 |
| Tin bronzes | bercoweld® B6 (CuSn6P) | Cu5180A (ISO 24373) SG-CuSn6 (DIN 1733) ERCuSn-A (AWS A5.7-2007) | | | | | 6.0 - 6.6 | 0.2-0.25 | | | Balance | ≤0.5 |
| | bercoweld® BS60 (CuSn6MnSi) | CuZ (CuSn6MnSi) (ISO 24373) | 0.2-0.3 | | | 0.2-0.35 | 5.5-6.0 | | | | Balance | ≤0.5 |
| | bercoweld® B8 (CuSn8P) | Cu5210 (ISO 24373) SG-CuSn6 (DIN 1733) ERCuSn-C (AWS A5.7-2007) | | | | | 7.6-8.0 | 0.05-0.1 | | | Balance | ≤0.5 |
| | bercoweld® B10 (CuSn10MnSi) | Cu5211 (ISO 24373) | 0.2-0.3 | | | 0.2-0.35 | 9.0-10.0 | | | | Balance | ≤0.5 |
| | bercoweld® B12 (CuSn12P) | Cu5410 (ISO 24373) | | | | | 12.0-13.0 | 0.15-0.25 | | | Balance | ≤0.5 |
| Aluminium bronzes | bercoweld® A52 (CuAl5Ni2Mn) | Cu6061 (ISO 24373) | | | 4.5-5.0 | 0.1-0.5 | | | | 1.6-2.0 | Balance | ≤0.5 |
| | bercoweld® A8 (CuAl7) | Cu6100 (ISO 24373) SG-CuAl8 (DIN 1733) ERCuAl-A1 (AWS A5.7-2007) | | | 7.5-8.0 | 0.1-0.3 | | | | 0.1-0.5 | Balance | ≤0.5 |
| | bercoweld® A822 (CuAl8Ni2Fe2Mn2) | Cu6327 (ISO 24373) SG-CuAl8Ni2 (DIN 1733) | | 0.5-2.5 | 7.0 - 9.5 | 0.5-2.5 | | | | 0.5-3.0 | Balance | ≤0.4 |
| | bercoweld® A10 (CuAl10Fe) | Cu 6180 (ISO 24373) ERCuAl-A2 (AWS 5.7-2007) | | ≤1.5 | 8.5-11.0 | | | | | | Balance | ≤0.5 |
| | bercoweld® A922 (CuAl8Ni2Fe2Mn2) | Cu6327 (ISO 24373) SG-CuAl8Ni2 (DIN 1733) | | 1.2-1.5 | 8.3-8.8 | 1.7-2.0 | | | | 2.2-2.5 | Balance | ≤0.4 |
| | bercoweld® A35 (CuAl9Ni5Fe3Mn2) | Cu6328 (ISO 24373) SG-CuAl9Ni5 (DIN 1733) ERCuNiAl (AWS A5.7-2007) | | 3.0-4.0 | 8.5-9.5 | 0.6-3.5 | | | | 4.0-5.0 | Balance | ≤0.5 |
| | bercoweld® A300 (CuMn12Al8Fe3Ni2) | Cu6338 (ISO 24373) SG-CuMn13Al7 (DIN 1733) ERCuMnNiAl (AWS A5.7-2007) | | 2.0-4.0 | 7.0-8.5 | 11.0-14.0 | | | | 1.5-3.0 | Balance | ≤0.5 |
| Copper nickel | bercoweld® N10 (CuNi10Fe) | Cu7061 (ISO 24373) SG-CuNi10Fe (DIN 1733) | | 1.0-1.5 | | 0.6-1.0 | | | | 10.2-10.7 | Balance | ≤0.4 Ti 0.1-0.5 |
| | bercoweld® N30 (CuNi30Mn1FeTi) | Cu7158 (ISO 24373) SG-CuNi30Fe (DIN 1733) ERCuNi (AWS A5.7-2007) | | 0.4-0.7 | | 0.6-1.0 | | | | 30.7-31.3 | Balance | ≤0.5 Ti 0.2-0.5 |
| Special | bercoweld® K1 (E-Cu58) | CuZ (Cu) (ISO 24373) | | | | | | | | | ≤99.9 | ≤0.1 |
| | bercoweld® K2 (Cu-OF1) | CuZ (Cu) (ISO 24373) | | | | | | | | | ≤99.95 | ≤0.01 |
| | bercoweld® M122 (CuMn12Ni2) | CuZ (CuMn12Ni2) (ISO 24373) | | | | 12.0-13.0 | | | | 2.0-5.0 | Balance | ≤0.5 |
| | bercoweld® Ms83 (CuZn17) | CuZ (CuZn17) (ISO 24373) | | ≤0.05 | | | | | | | 81-84 | ≤0.2 |

| Physical Properties of the Material | | | | | Mechanical Properties Weld Joint | | | | Application |
|--|--------------------------|---|--------------------|------------------------------|----------------------------------|----------------|--------------------------------|--------------------------------|--|
| Electrical conductivity (m/Ω mm ²) | Heat conductivity (W/mK) | Coefficient of expansion (20-100°C) (10 ⁻⁶ /K) | Melting range (°C) | Density (g/cm ³) | Tensile strength (MPa) | Elongation (%) | Brinell hardness (HB 2.5/62.5) | Notch bar impact energy KV (J) | |
| 41-52 | 293-364 | 17 | ~1080 | 8.94 | ≥220 | ≥40 | ≥50 | 65 | Joining gray cast iron, steel and copper |
| 15-20 | 120-145 | 18.1 | 1020-1050 | 8.9 | ≥220 | ≥30 | ≥60 | 75 | Joining and overlay welding on copper, joining gray cast iron |
| 3.5-4 | 35 | 18.1 | 965-1035 | 8.5 | ≥350 | ≥40 | ≥80 | 60 | Zinc-coated car body sheets in the automotive industry |
| 4.7-5.3 | 40 | 18.1 | 1030-1050 | 8.7 | ≥285 | ≥45 | ≥62 | 75 | Zinc-coated car body sheets in the automotive industry |
| 44-46 | 220-315 | 17.7 | 1070-1080 | 8.9 | ≥200 | ≥30 | ≥60 | 75 | Especially for joining and overlay welding on copper |
| 6-7 | 75 | 18.1 | 910-1040 | 8.7 | ≥260 | ≥20 | ≥80 | 32 | Repairs to bronzes, furnace brazing, solenoid valves, heat exchangers |
| 7.3-7.9 | 62 | 18.4 | 900-1040 | 8.8 | ≥359 | ≥44 | ≥101 | 68 | Zinc-coated car body sheets in the automotive industry |
| 6-8 | 67 | 18.5 | 875-1025 | 8.8 | ≥260 | ≥20 | ≥80 | 32 | Repairs to bronzes, furnace brazing, solenoid valves, heat exchangers |
| 5-6 | 47 | 18 | 887-1020 | 8.7 | ≥290 | ≥14 | ≥115 | 24 | Zinc-coated car body sheets in the automotive industry |
| 3-5 | 40-50 | 18.5 | 825-990 | 8.6 | ≥320 | ≥5 | ≥120 | 8 | Particularly for wear-resistant coatings (bearing bushes and side rails) |
| 8-8.8 | 61 | 17.5 | 1060-1085 | 8.2 | ≥353 | ≥45 | ≥84 | 161 | Solenoid valves, shipbuilding, containers, rail cars |
| 7-9 | 65 | 17 | 1030-1040 | 7.7 | ≥430 | ≥40 | ≥100 | 100 | Joining of zinc-coated car body sheets with higher strength demand |
| 4.5-5.5 | 50 | 17 | 1030-1050 | 7.5 | ≥530 | ≥30 | ≥140 | 70 | Seawater and corrosion resistant applications |
| 6.5-7.5 | 55 | 16.5 | 1030-1040 | 7.6 | ≥500 | ≥35 | ≥140 | 95 | Galvanized sheet metal, solenoid valves, shipbuilding |
| 4.5-5.5 | 50 | 17 | 1030-1050 | 7.5 | ≥530 | ≥30 | ≥150 | 70 | Seawater and corrosion resistant applications |
| 3-4 | 20-40 | 19.3 | 1015-1045 | 7.5 | ≥690 | ≥16 | ≥200 | 68 | For high wear, cavitation and corrosion resistant applications |
| 3-5 | 30 | 21.5 | 945-985 | 7.4 | ≥900 | ≥10 | ≥290 | 180 | Ship propellers, slide rails, control valve housings |
| 2.8-3.2 | 30 | 17 | 1100-1145 | 8.9 | ≥300 | ≥34 | ≥80 | 190 | Shipbuilding, pipelines, chemical industry |
| 2.7-3.3 | 30 | 17.3 | 1180-1240 | 8.9 | ≥420 | ≥36 | ≥115 | 240 | Shipbuilding, pipelines, chemical industry |
| 58.6 | 394 | 17.3 | 1083 | 8.93 | ≥200 | ≥40 | ≥50 | 60 | Especially for joining and overlay welding on copper |
| 58.6 | 394 | 17.3 | 1083 | 8.94 | ≥200 | ≥40 | ≥50 | 60 | Especially for joining and overlay welding on copper |
| 2.2-2.4 | 22 | 18.3 | 950-970 | 8.4 | ≥400 | ≥40 | ≥100 | 100 | Especially for solenoid valves |
| 20-22 | 148 | 18.6 | 985-1020 | 8.75 | ≥220 | ≥35 | ≥70 | 55 | MIG and TIG welding Suitable for tandem welding |

Our highlights for laser brazing

What we have to offer:

- Special treatment and monitoring of our premium quality for laser applications
- More than 20 years experience in the production of bercoweld® S3 and A8 for MIG and laser applications in the automotive industry
- Preferred quality supplier to all European and Asian car manufacturers and their subcontractors
- Technical cooperation with all European welding and laser equipment suppliers
- Worldwide footprint due to cooperation with agents and distributors well experienced in MIG and laser applications

Our tolerances:

bedra commits to even tighter tolerances than the international standards. That's why we can guarantee an absolute consistent and reproducible brazing result. Through the use of high quality metals impurities are kept at minimum. Thus, porosities and spatters in the seam can be avoided.

| Designation | Chemical Composition (%) | | | | | | | | | | |
|--|--------------------------|---------|------|-----------|---------|-------|----------|-------|-------|-------|------------------------|
| | Cu | Al | Fe | Mn | Ni | Pb | Si | Sn | Zn | P | Others total (incl. *) |
| bercoweld® S3 | Balance | ≤0.01 | ≤0.1 | 0.75-0.95 | - | ≤0.01 | 2.8-2.95 | ≤0.05 | ≤0.1 | ≤0.02 | ≤0.2 |
| Cu6560 (ISO 24373) | Balance | ≤0.01 | ≤0.5 | 0.5-1.5 | - | ≤0.02 | 2.8-4.0 | ≤1.0 | ≤1.0 | - | ≤0.5 |
| ERCuSi-A (C65600) (ANSI/AWS A5.7) | Balance | ≤0.01 | ≤0.5 | ≤1.5 | - | ≤0.02 | 2.8-4.0 | ≤1.0 | ≤1.0 | - | ≤0.5 |
| bercoweld® A8 | Balance | 7.5-8.0 | ≤0.1 | 0.1-0.3 | 0.1-0.3 | ≤0.01 | ≤0.1 | ≤0.03 | ≤0.07 | ≤0.02 | ≤0.2 |
| Cu6100 (ISO24373) | Balance | 6.0-8.5 | * | ≤0.5 | * | ≤0.02 | ≤0.1 | * | ≤0.2 | - | ≤0.5 |
| ERCuAl_A1 (C61000) (ANSI/AWS A5.7) | Balance | 6.0-8.5 | * | ≤0.5 | * | ≤0.02 | ≤0.1 | * | ≤0.2 | - | ≤0.5 |

Your benefits:

- Our bercoweld® S3 ensures an impeccable paint of the brazed joint (e.g. laser roof seam. No local shading of the paint is generated.
- Due to bedra's very narrow tolerances a readjustment of the parameters of the power source is not necessary.
- For diameter 1,60 mm bedra supplies an optimized specification that allows for very smooth and uniform unwinding even with this bigger dimension. That leads to a better feeding of the wire out of the drum and all the way to the welding tip.



Packaging

Spools

| Plastic spool S200 | Plastic spool S300 | Wire basket BS300 | Wire basket B300 |
|--|--------------------|-------------------|--|
| | | | |
| <h3>Coils</h3> <p>outer diameter: ~450-600mm inner diameter: ~350-450mm weight (depending on dimension): 25-100kg Special dimensions on demand</p> | | | <h3>Rods</h3> <p>length: ~250-3000mm Special dimensions on demand, burr-free cut, flat embossing possible for meter rods</p> |


bedrabox

| | | <table border="1"> <thead> <tr> <th></th> <th>Filling weight (kg)</th> <th>Dimensions (mm)</th> <th>Core Ø (mm)</th> </tr> </thead> <tbody> <tr> <td>bedrabox</td> <td>175-200</td> <td>510x770</td> <td>315</td> </tr> </tbody> </table> | | Filling weight (kg) | Dimensions (mm) | Core Ø (mm) | bedrabox | 175-200 | 510x770 | 315 |
|----------|---------------------|--|-------------|---------------------|-----------------|-------------|----------|---------|---------|-----|
| | Filling weight (kg) | Dimensions (mm) | Core Ø (mm) | | | | | | | |
| bedrabox | 175-200 | 510x770 | 315 | | | | | | | |
| | | <p>Accessories: For accessories, such as hood or wire feeding please refer to our separate accessories brochure.</p> <p>The bedrabox is made from recycled and recyclable cardboard. That's good for the environment and good for you as the bedrabox can easily be returned into the raw material cycle. </p> | | | | | | | | |

Drums

| | | <table border="1"> <thead> <tr> <th></th> <th>Filling weight (kg)</th> <th>Dimensions (mm)</th> <th>Core Ø (mm)</th> </tr> </thead> <tbody> <tr> <td>Drum (a)</td> <td>100</td> <td>510x410</td> <td>315</td> </tr> <tr> <td>Drum (b)</td> <td>200</td> <td>510x800</td> <td>315</td> </tr> </tbody> </table> | | Filling weight (kg) | Dimensions (mm) | Core Ø (mm) | Drum (a) | 100 | 510x410 | 315 | Drum (b) | 200 | 510x800 | 315 |
|----------|---------------------|---|-------------|---------------------|-----------------|-------------|----------|-----|---------|-----|----------|-----|---------|-----|
| | Filling weight (kg) | Dimensions (mm) | Core Ø (mm) | | | | | | | | | | | |
| Drum (a) | 100 | 510x410 | 315 | | | | | | | | | | | |
| Drum (b) | 200 | 510x800 | 315 | | | | | | | | | | | |
| | | <p>Accessories: For accessories, such as hood or wire feeding please refer to our separate accessories brochure.</p> | | | | | | | | | | | | |

Delivery options

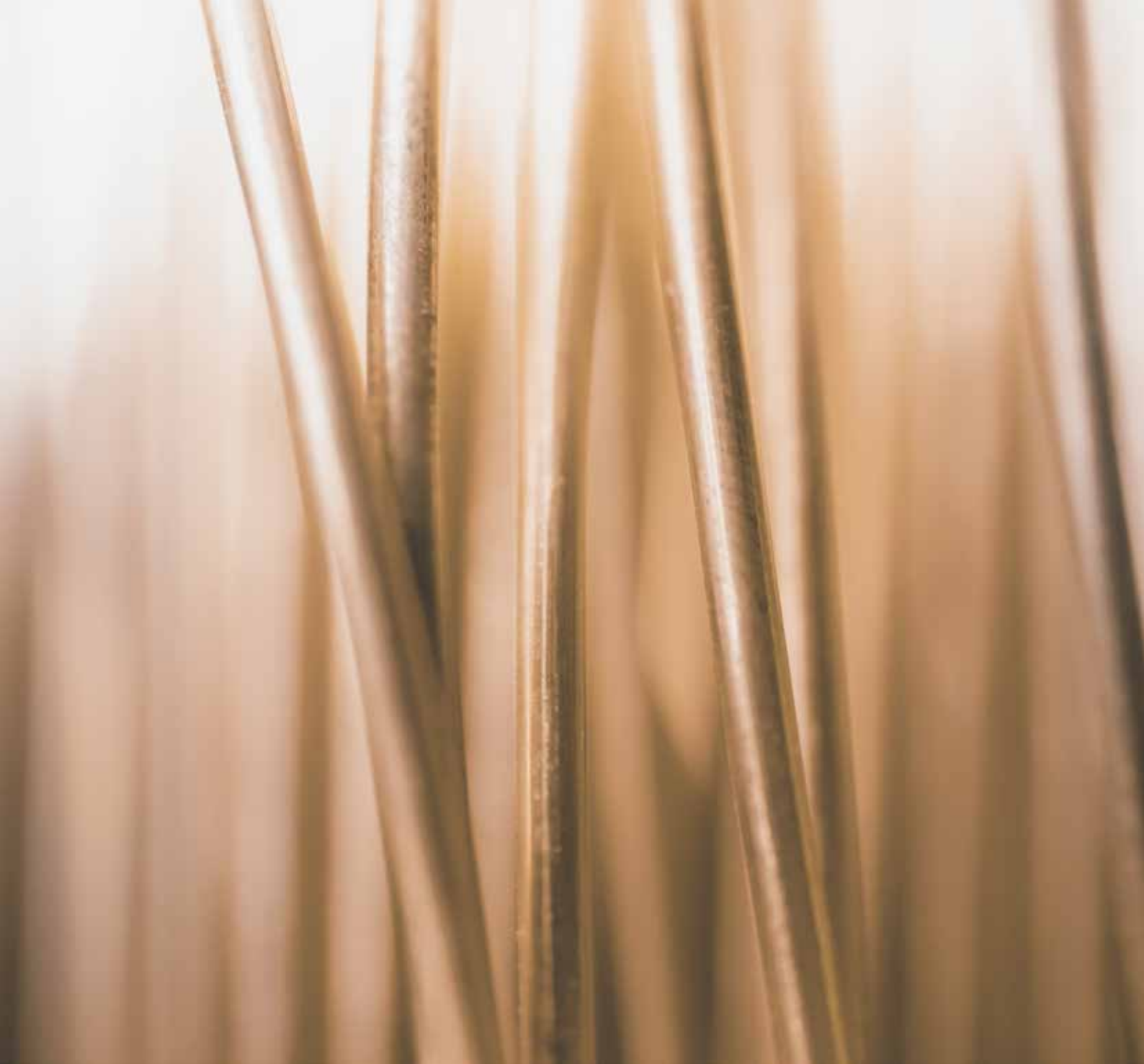
| | Make up | Filling weight/length | Diameters |
|--|--------------------|-----------------------|--------------|
|  | bedrabox / Drum | 175-200 kg | 0.80-1.6 mm |
|  | SD300/BS300/K300 | 12-15 kg | 0.80-2.40 mm |
|  | H500 H560 H760 | 150-250 kg | 0.80-2.40 mm |
|  | Coil | 25-100 kg | 1.60-6.00 mm |
|  | Rod | 250-3000 mm | 1.60-6.00 mm |

Calculation of running length

| Make-Up and Dimensions | S3 (Density: 8.5 kg/dm ³) | A8 (Density: 7.7 kg/dm ³) |
|---------------------------------|--|--|
| Spool: 15kg Diameter: 0,8mm | 3,515 m | 3,877 m |
| Spool: 15kg Diameter: 1 mm | 2,248 m | 2,482 m |
| Spool: 15kg Diameter: 1.2 mm | 1,564 m | 1,723 m |
| Spool: 15kg Diameter: 1.6 mm | 878 m | 969 m |
| Drum: 200kg Diameter: 1mm | 29,974 m | 33,088 m |
| Drum: 200kg Diameter: 1.2mm | 20,814 m | 22,978 m |
| Drum: 200kg Diameter: 1.6mm | 11,709 m | 12,925 m |

Finding the right bercoweld® alloy

| base to base material | DC 05, 1.0 mm | DC 05, 1.0 mm | DC 05, 0.9 mm | DX 54D+Z, 1.6mm | DX 54D+Z, 3.0mm | DX 55D+Z, 1.0mm | H180 B, 0.8mm | H220 B, 1.0mm | H220 B, 2.0mm | H260 LA, 1.0mm | H260 LA, 1.2mm | H260 LA, 2.0mm | H340 LA, 1.5mm |
|-----------------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|
| DC 05, 1.0mm | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| DC 05, 1.5mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | | | | |
| DX 53D+Z, 0.9mm | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| DX 54D+Z, 1.6mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | | | | |
| DX 54D+Z, 3.0mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | S3 A8 | | | |
| DX 55D+Z, 1.0mm | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| H180 B, 0.8mm | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| H220 B, 1.0mm | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| H220 B, 2.0mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | S3 A8 | | | |
| H260 LA, 1.0mm | S3 A8 | | S3 A8 | | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 | S3 A8 |
| H260 LA, 1.2mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | S3 A8 | | | |
| H260 LA, 2.0mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | S3 A8 | | | |
| H340 LA, 1.5mm | S3 A8 | | S3 A8 | | | S3 A8 | S3 A8 | S3 A8 | | S3 A8 | | | |



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