



## TECHNICAL SPECIFICATIONS OF GENERAL PURPOSE COPPER POWDER GRADES

### Light

| Grid size<br>per ISO 565, $\mu\text{m}$                                                               | Particle size,<br>$\mu\text{m}$ | Particle size distribution, % |           |           |
|-------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------|-----------|-----------|
|                                                                                                       |                                 | CPL-1                         | CPL-2     | CPL-3     |
| 63                                                                                                    | $\geq 63$                       | 5.0 max                       | 5.0 max   | 10.0 max  |
|                                                                                                       | $< 63$                          | 95.0 min                      | 95.0 min  | 90.0 min  |
| Note: in the particle size value, "<" represents undersize material, "≥" represents oversize material |                                 |                               |           |           |
| Apparent density, $\text{g/cm}^3$                                                                     |                                 | 0.65-0.85                     | 0.90-1.10 | 1.25-1.45 |
| Copper mass fraction, %, min                                                                          |                                 | 99.5                          | 99.6      |           |
| Oxygen mass fraction, %, max                                                                          |                                 | 0.40                          | 0.30      | 0.25      |

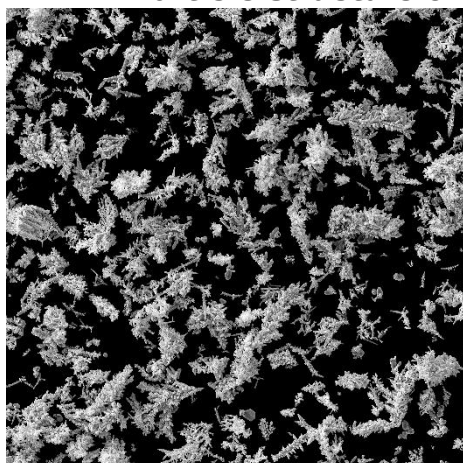
For use in metallurgical and chemical industries as alloying additives, catalysts, production of reagents.

### Fine

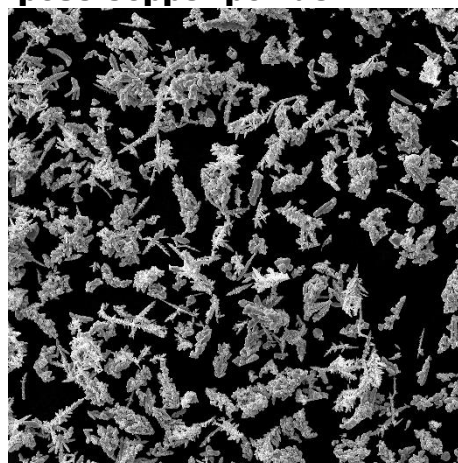
| Grid size<br>per ISO 565, μm                                                                          | Particle size,<br>μm | Particle size distribution, % |           |           |           |
|-------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|-----------|-----------|-----------|
|                                                                                                       |                      | CPF-1                         | CPF-2     | CPF-3     | CPF-4     |
| 45                                                                                                    | <45                  | 95.0 min                      |           | —         |           |
| 25                                                                                                    | <25                  | —                             |           | 90.0 min  |           |
| Note: in the particle size value, “<” represents undersize material, “≥” represents oversize material |                      |                               |           |           |           |
| Apparent density, g/cm³                                                                               |                      | 1.60-2.00                     | 1.25-1.60 | 1.10-1.60 | 1.60-2.00 |
| Copper mass fraction, %, min                                                                          |                      | 99.5                          |           |           |           |
| Oxygen mass fraction, %, max                                                                          |                      | 0.20                          |           | 0.30      |           |

For use in the electronics industry (thick and thin filming, mixing with silver to make pastes), metal injection molding, production of conductive fillers, diamond tools, catalysts, and vacuum switches.

### Particle structure of general purpose copper powder



**Light**



**Fine**



### Medium

| Grid size<br>per ISO 565, μm                                                                          | Particle size,<br>μm | Particle size distribution, % |           |           |           |           |           |          |
|-------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|-----------|-----------|-----------|-----------|-----------|----------|
|                                                                                                       |                      | CPS-1                         | CPS-11    | CPS-12    | CPS-14    | CPS-A     | CPS-C     | CPS-N    |
| 450                                                                                                   | <450                 | —                             | —         | —         | —         | —         | 90.0 min  | —        |
| 224                                                                                                   | <224                 | —                             | —         | —         | —         | —         | —         | 95.0 min |
| 180                                                                                                   | <180                 | —                             | —         | —         | —         | —         | 10.0 max  | —        |
| 100                                                                                                   | ≥100                 | —                             | 0.1 max   | —         | —         | —         | —         | —        |
|                                                                                                       | <100                 | 99.5 min                      | —         | 99.5 min  | 99.5 min  | 99.5 min  | —         | —        |
| 71                                                                                                    | <71                  | 90.0 min                      | —         | 90.0 min  | 90.0 min  | 90.0 min  | —         | —        |
| 63                                                                                                    | <63                  | —                             | 95.0 min  | —         | —         | —         | —         | —        |
| 45                                                                                                    | <45                  | 65.0-80.0                     | —         | 65.0-80.0 | 65.0-80.0 | 73.0-80.0 | —         | —        |
| Note: in the particle size value, “<” represents undersize material, “≥” represents oversize material |                      |                               |           |           |           |           |           |          |
| Apparent density, g/cm³                                                                               |                      | 1.25-2.00                     | 1.25-1.90 | 1.20-1.60 | 1.50-2.00 | 1.30-1.50 | 2.50-3.50 |          |
| Copper mass fraction, %, min                                                                          |                      | 99.5                          |           |           |           |           |           |          |
| Oxygen mass fraction, %, max                                                                          |                      | 0.20                          |           |           |           | 0.30      | 0.50      |          |

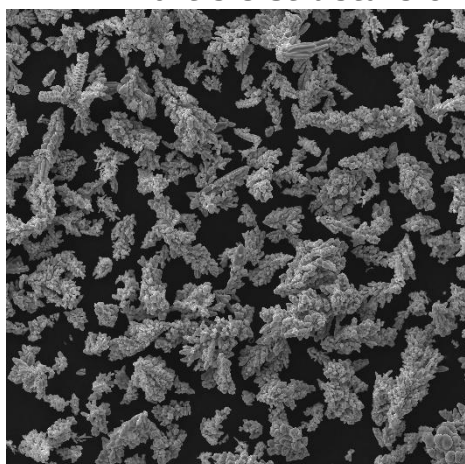
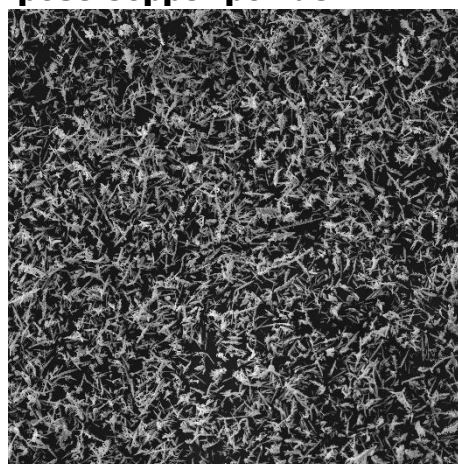
For the production of sintered products in metallurgical, electrical, aeronautical, automotive, machine-building industries (brushes for electric machines, rings, bushings, bearings, electrical contacts, welding electrodes, brake pads, clutch linings, diamond tools, consumer goods for household and economic purposes).

### Ultrafine

| Characteristics                                                             | Values    |          |
|-----------------------------------------------------------------------------|-----------|----------|
|                                                                             | CPU-5     | CPU-10   |
| D50, $\mu\text{m}$                                                          | 4.25-5.75 | 9.0-11.0 |
| D99, $\mu\text{m}$                                                          | <30       | <100     |
| Note: D50 (D99) - the share of particles of the specified size is 50% (99%) |           |          |
| Apparent density, $\text{g/cm}^3$                                           | 0.6-1.6   |          |
| Specific surface area, $\text{cm}^2/\text{g}$ , min                         | 2500      |          |
| Copper mass fraction, %, min                                                | 99.3      |          |
| Oxygen mass fraction, %, max                                                | 0.45      |          |

For the production of electronic circuits, thick film pastes, electrically and thermally conductive pastes, electrodes, pyrotechnics, printing (screen-printing), conductive inks for RFID tags and portable electronics, anticorrosive, electromagnetic shielding and decorative coatings.

### Particle structure of general purpose copper powder


**Medium**

**Ultrafine**



## TECHNICAL SPECIFICATIONS OF REDUCED COPPER POWDER GRADES

| Grid size<br>per ISO 565, $\mu\text{m}$                                                               | Particle size,<br>$\mu\text{m}$ | Particle size distribution, % |         |         |         |         |         |         |        |
|-------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------|---------|---------|---------|---------|---------|---------|--------|
|                                                                                                       |                                 | CPR-A                         | CPR-B   | CPR-C   | CPR-D   | CPR-E   | CPR-F   | CPR-G   | CPR-H  |
| 600                                                                                                   | $\geq 600$                      | –                             | –       | –       | –       | –       | –       | –       | 3 max  |
| 300                                                                                                   | $\geq 300$                      | –                             | –       | –       | –       | –       | –       | 3 max   | 10-40  |
| 250                                                                                                   | $\geq 250$                      | –                             | –       | –       | –       | –       | –       | 15 max  | –      |
| 212                                                                                                   | $\geq 212$                      | 0.5 max                       | 0.5 max | –       | –       | –       | –       | –       | 50-80  |
| 180                                                                                                   | $\geq 180$                      | 5 max                         | 2 max   | 0.5 max | –       | –       | –       | –       | –      |
| 150                                                                                                   | $\geq 150$                      | –                             | –       | 1 max   | 0.5 max | 0.5 max | –       | 60-90   | –      |
| 106                                                                                                   | $\geq 106$                      | 25-45                         | 10-30   | 6 max   | 3 max   | 2 max   | 0.5 max | –       | –      |
| 75                                                                                                    | $\geq 75$                       | –                             | –       | –       | 10-20   | 10 max  | –       | 97 min  | 97 min |
|                                                                                                       | $< 75$                          | –                             | –       | –       | –       | –       | –       | 3 max   | 3 max  |
| 63                                                                                                    | $\geq 63$                       | 60-80                         | 45-65   | 30-40   | –       | –       | 10 max  | –       | –      |
| 45                                                                                                    | $\geq 45$                       | 75-95                         | 65-85   | 50-60   | 50-60   | 35-45   | 15-35   | –       | –      |
|                                                                                                       | $< 45$                          | 5-25                          | 15-35   | 40-50   | 40-50   | 55-65   | 65-80   | –       | –      |
| Note: in the particle size value, "<" represents undersize material, "≥" represents oversize material |                                 |                               |         |         |         |         |         |         |        |
| Apparent density, $\text{g/cm}^3$                                                                     |                                 | 2.25-2.55                     |         |         |         | 2.1-2.5 | 1.8-2.2 | 2.4-3.2 |        |
| Copper mass fraction, %, min                                                                          |                                 | 99.7                          |         |         |         |         |         | 99.6    |        |
| Oxygen mass fraction, %, max                                                                          |                                 | 0.2                           |         |         |         |         |         | 0.25    |        |

For the production of sintered products in metallurgical, electrical, aeronautical, automotive, machine-building industries (brushes for electric machines, parts made of copper powder-based dispersion-hardened composite materials, conductive tips and electrodes for welding, soldering iron tips, heavily loaded dry sliding bearings).

### Particle structure of reduced copper powder

