

# Material data sheet TOMFER

Status: 24.03.2005

## Cladding composite

## TOMFER

(Low carbon steel, single or double side cladded with red brass)

### Brief description

TOMFER is a single- or double side cold rolled cladded composite material combining the forming and strength properties of low carbon deep drawing steel with the physical and decorative properties of red brass.

### Standard-Raw materials

| Position       | Material                     | Description   | Material-No. | Norm         |
|----------------|------------------------------|---------------|--------------|--------------|
| Core           | Unalloyed deep drawing steel | DD14          | 1.0389       | DIN EN 10111 |
| Cladding layer | Red brass                    | CuZn10 (Ms90) | 2.0230       | EN 1652      |
| Cladding layer | Red brass                    | CuZn15 (Ms85) | 2.0240       | EN 1652      |

### Chemical composition

| Steel | C         | Mn        | P          | S          | Al             |
|-------|-----------|-----------|------------|------------|----------------|
| DD14  | -<br>0,08 | -<br>0,35 | -<br>0,025 | -<br>0,025 | 0,015<br>0,070 |

| Red brass          | Cu           | Al        | Fe        | Ni       | Pb        | Sn       | Zn        | Other elements |
|--------------------|--------------|-----------|-----------|----------|-----------|----------|-----------|----------------|
| CuZn10<br>(CW501L) | 89,0<br>91,0 | -<br>0,02 | -<br>0,05 | -<br>0,3 | -<br>0,05 | -<br>0,1 | Rest<br>- | -<br>0,1       |
| CuZn15<br>(CW502L) | 84,0<br>86,0 | -<br>0,02 | -<br>0,05 | -<br>0,3 | -<br>0,05 | -<br>0,1 | Rest<br>- | -<br>0,1       |

### Deliverable (standard-) dimensions

Strip thickness: 0,2 – 1,50 mm  
Strip width: 20 – 650 mm  
Cut-to-length: 1.000 – 2.000 mm

### Cladded layers and adhesion

Nominal layer thickness: Double-sided 5/5 or 10/10 % of strip thickness, alternatively one-sided or difference cladding on request  
Adhesion: Not possible to strip off the cladded layer from the steel core  
Measuring of the layer thickness: Magnetic force, metallographical or gravimetric

### Surface qualities

| Type/description | Characteristics  | Roughness Ra   |
|------------------|--|----------------|
| bright           | Bright, metallicly clean surface. Pittings, grooves and scratches are permitted as long as the uniform smooth appearance is not essentially impaired when viewed with the naked eye. | < 0,10 µm      |
| regular          | Metallicly clean surface. Pittings, minimal defects and scratches are acceptable in a scale not impairing the technical function of the outside layers of the composite material.    | 0,15 – 0,80 µm |
| isotropic        |  | 1,0 – 2,0      |

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## Mechanical characteristics

| Cladded layer<br>Red brass<br>(%) | Surface type                   | Strength<br>condition <sup>1)</sup> | Yield stress<br>$R_{p0,2}$ (N/mm <sup>2</sup> ) | Tensile<br>strength<br>$R_m$ (N/mm <sup>2</sup> ) | Elongation<br>$A_{80}$ (%) |
|-----------------------------------|--------------------------------|-------------------------------------|---|---|----------------------------|
| 5/5<br>10/10                      | regular<br>isotropic           | LC                                  | max. 250  | max. 370  | min.34                     |
| 5/5<br>10/10                      | bright<br>regular<br>isotropic | LC+                                 | 200-320<br>180-300                              | 300-380<br>280-370                                | min. 30                    |
| 5/5<br>10/10                      | regular                        | C330<br>C320                        | min. 300<br>min. 280                            | 330-420<br>310-410                                | min. 12                    |
| 5/5<br>10/10                      | regular                        | C380<br>C370                        | ---<br>---                                      | 380-480<br>370-470                                | min. 4                     |

<sup>1)</sup> Description LC and Cxxx according to DIN EN 10139

The forming properties are not adjusted isotropic because of the production technology.

## Tolerances

- Size limits of thickness - according to classes A, B, C of DIN EN 10140
- Size limits of width - according to classes A, B of DIN EN 10140
- Size limits of length - according to classes A, B of DIN EN 10140

## Edge types

GK, NK according to DIN EN 10140

## Delivery forms

Strips, sheets

## Ordering example

Every order should be specified in consideration of the following information based on this material data sheet:

| Product features   | Example 1                              | Example 2  |
|--|--|--|
| Cladding composite   | TOMFER                                 | TOMFER   |
| Layer material   | CuZn10                                 | CuZn15   |
| Cladded layer P(side1-side2) (%)                                       | P(05-05)                               | P(10-00)   |
| Strength condition   | LC                                     | C380   |
| Surface quality  | bright                                 | regular  |
| Edge type  | GK                                     | GK   |
| Delivery form  | strips                                 | sheets   |
| Thickness (tolerance) x width (tolerance) x<br>length (tolerance) (mm) | 0,80 (+/- 0,025) x<br>100 (+/-0,13) mm | 1,20 (+/-0,030) x<br>420 (+/-0,30) x<br>1.500 (-0/+6) mm |

## Miscellaneous

All information in this material data sheet are referring to TOMFER-materials based on a standard production.

Further product features on request.