

Amphenol Automotive

Amphenol-Tuchel Electronics GmbH

Amphenol Automotive Products Group



RADSOK R8S



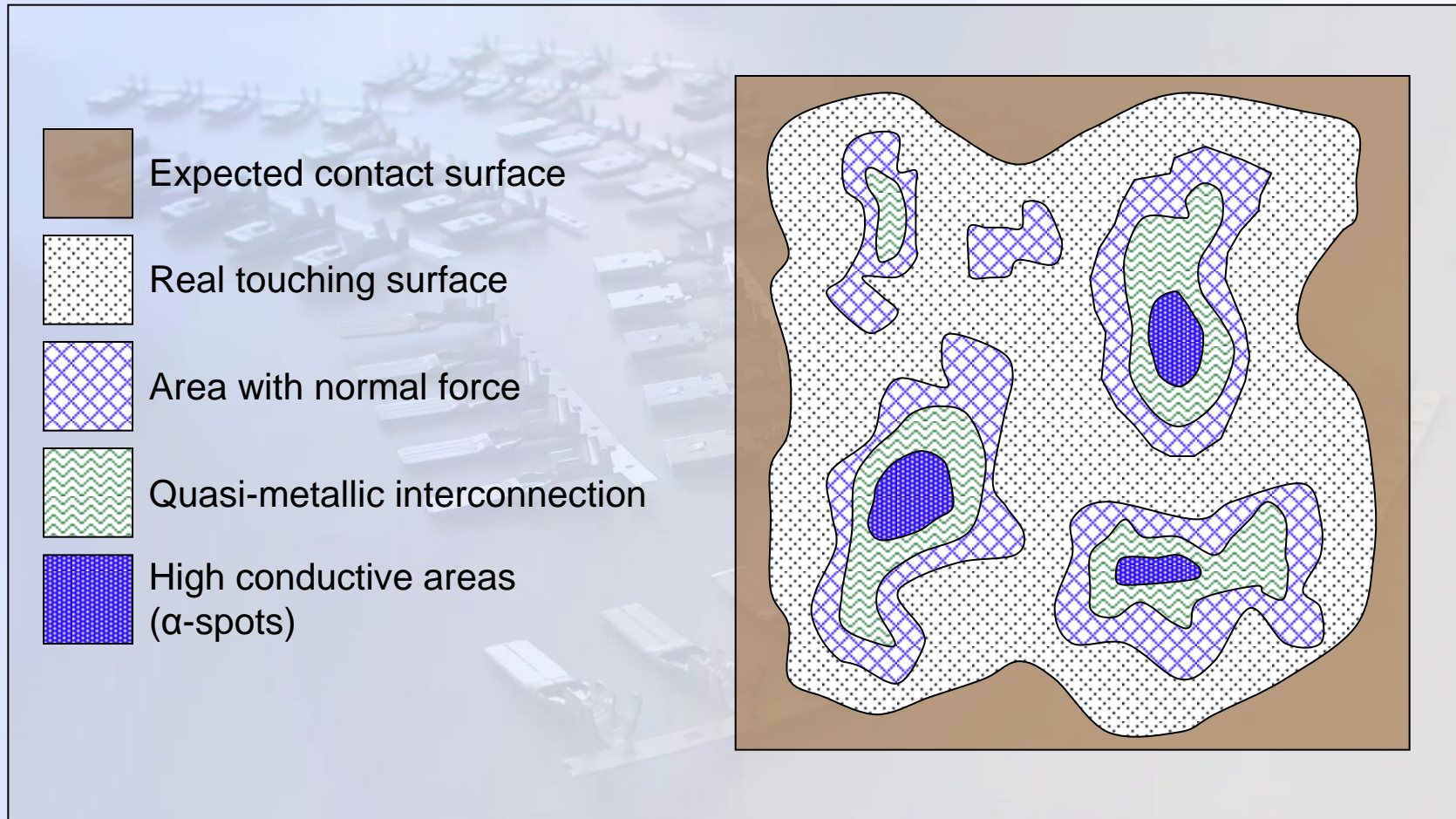
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General Contact Information

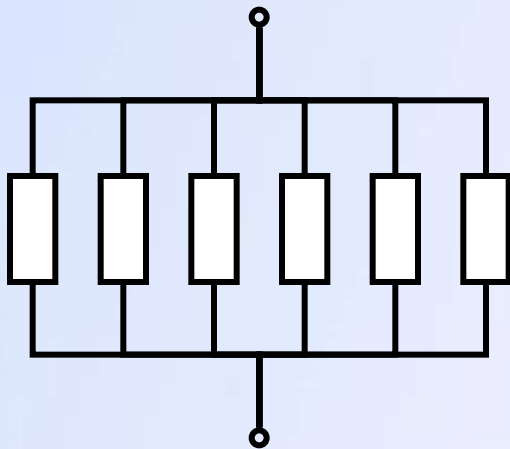
General Function Explain – Contact general - contact areas



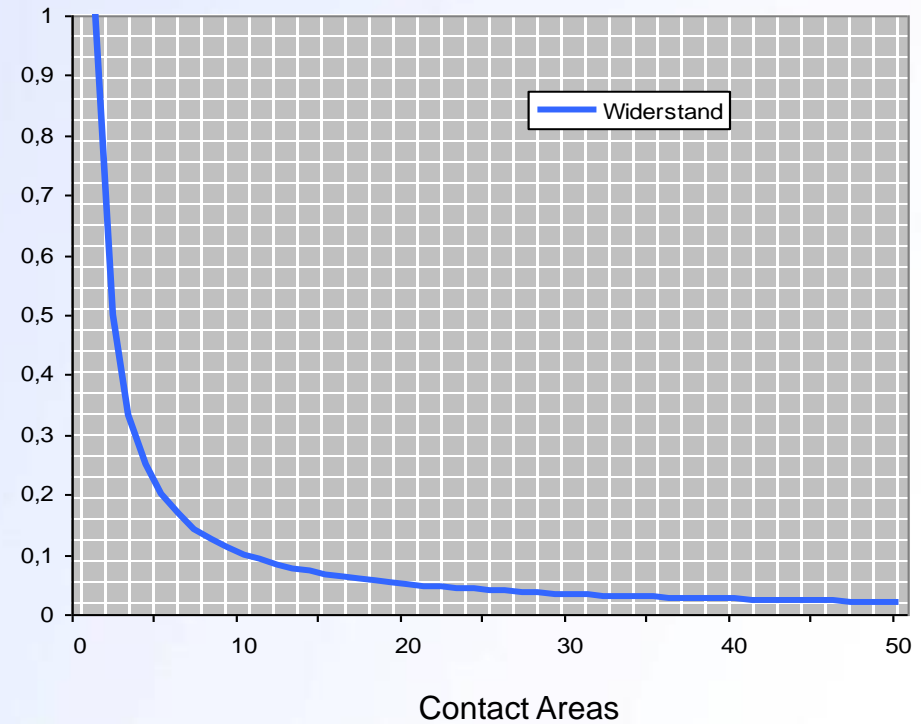
General Function Explain – Contact general - contact resistance

- ▶ Parallel connection of α -spots

$$R_{ges} = \frac{R_1 \cdot R_2 \cdot R_{...} \cdot R_n}{(R_2 \cdot R_3 \cdot R_{...} \cdot R_n) + (R_1 \cdot R_3 \cdot R_{...} \cdot R_n) + (...)}$$



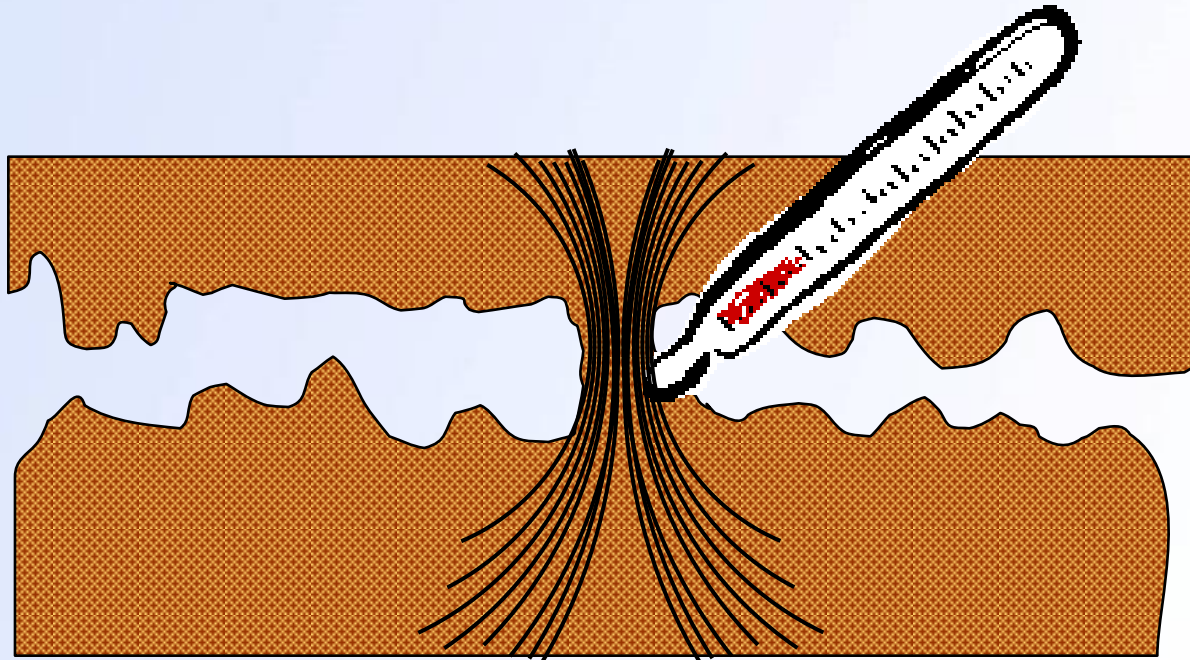
Übergangswiderstand



General Function Explain – Contact general – Current though α -Spot

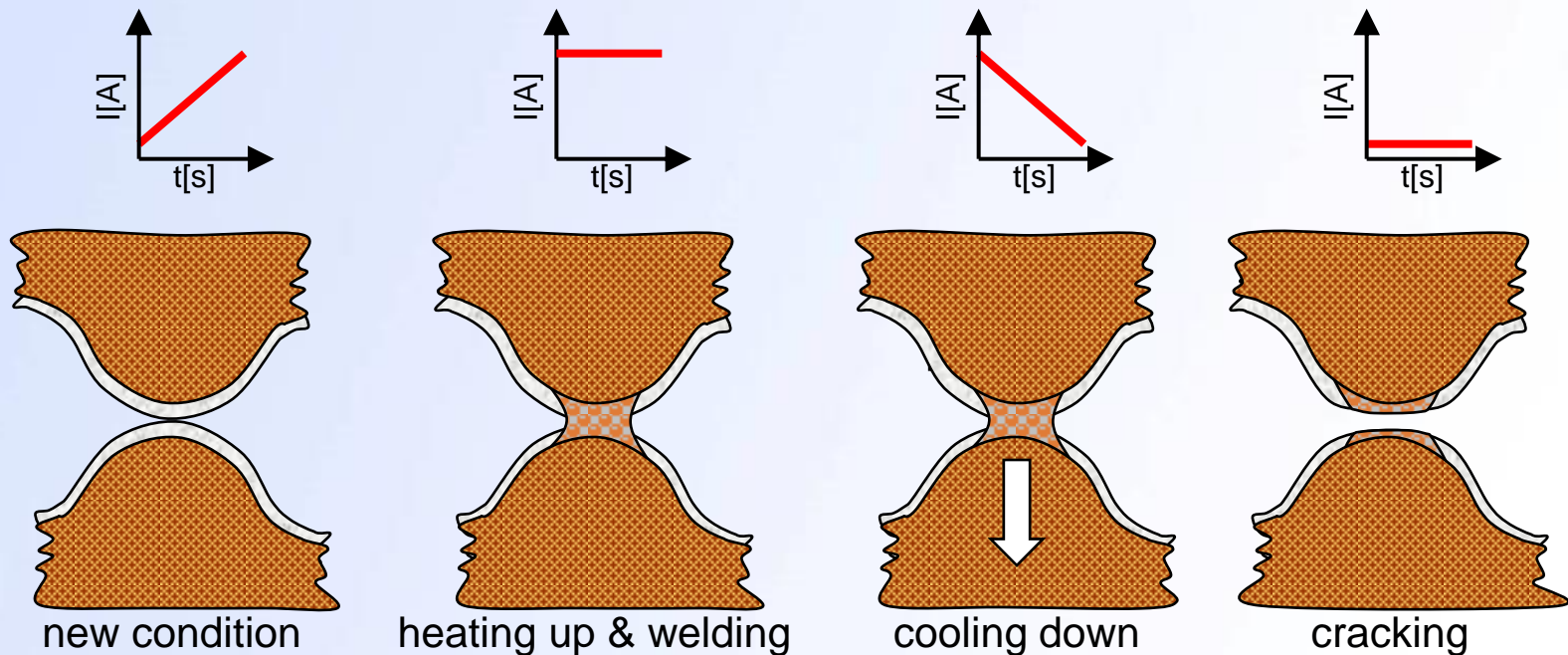
Temperature rise of transition spot according to high current density

- ▶ Microwelding



General Function Explain – Contact general – Contact erosion

- ▶ „Hot“ Microwelding due to high current density
- ▶ Cracking of welded spot during cooling down
- ▶ Contact erosion in the area of damaged surface plating



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RADSOK R8S



General Information – RADSOK R8S

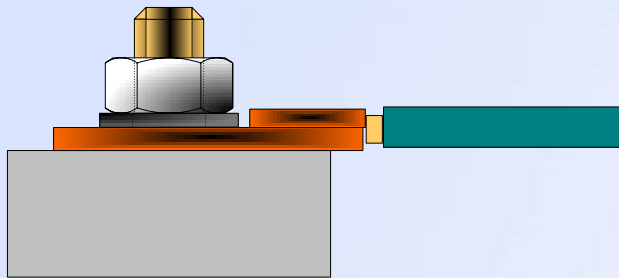


- ▶ **RADSOK R8S is...**
 - ▶ ... a ***symmetric socket contact*** for applications in **Automotive and Industrial sectors**
 - ▶ ... ***several connection possibilities*** available for your application (e.g. pressed in a copper terminal, crimped, welded to a busbar, ...)
 - ▶ ... produced by a precision and price optimized ***stamping and bending process***
 - ▶ ...soon available in different diameters for different current load

General Function Explain –

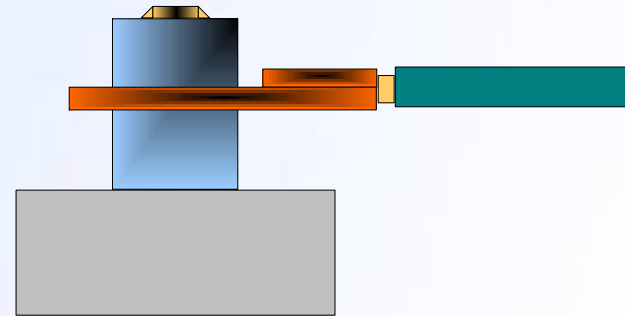
RADSOK general – Comparison plugging - screwing

Bolted ring terminal solution



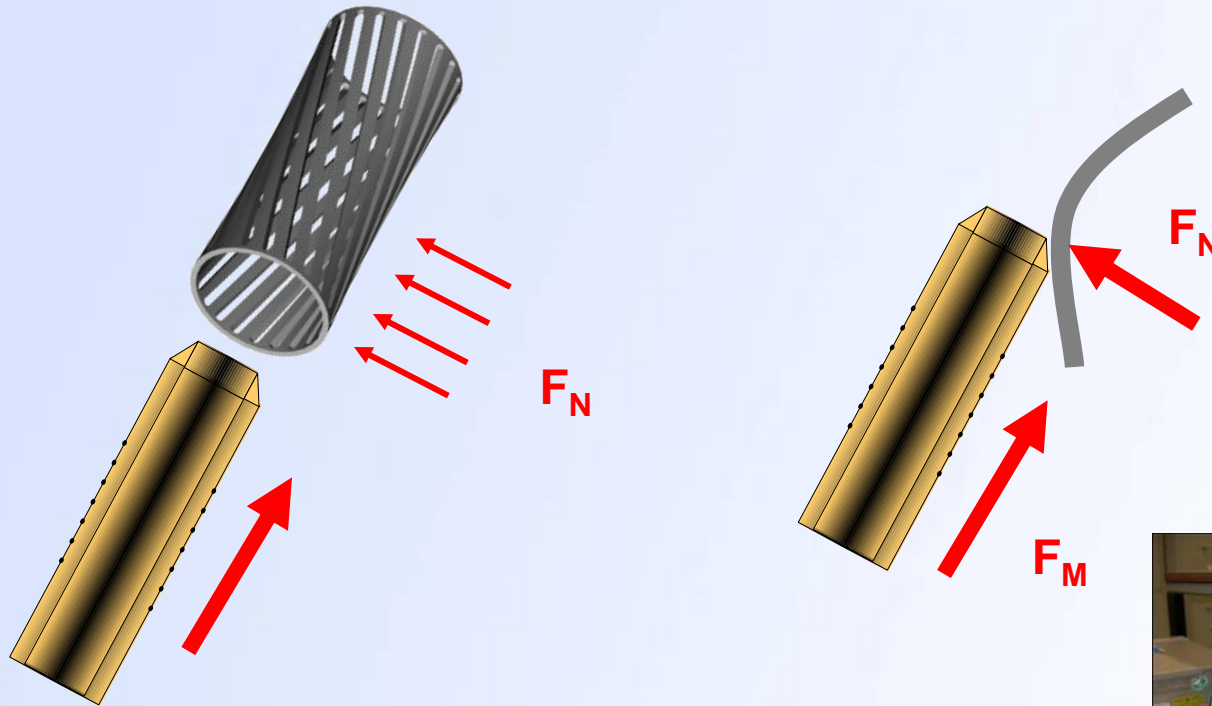
- ▶ **threaded bolt**
- ▶ **additional tooling necessary**
- ▶ **fixation of ring terminal during assembly**
- ▶ **difficult sealing against fluids**
- ▶ **corrosion sensitive**
- ▶ **possibility of damaged thread by maintenance worker**

RADSOK



- ▶ **no tooling**
- ▶ **quick and easy assembly by plugging**
- ▶ **standard bolt (no thread)**
- ▶ **hidden assembly possible**
- ▶ **easy maintenance**
- ▶ **axial assembly (e.g. in line) possible**

General Function Explain – RADSOK general – Mating Force

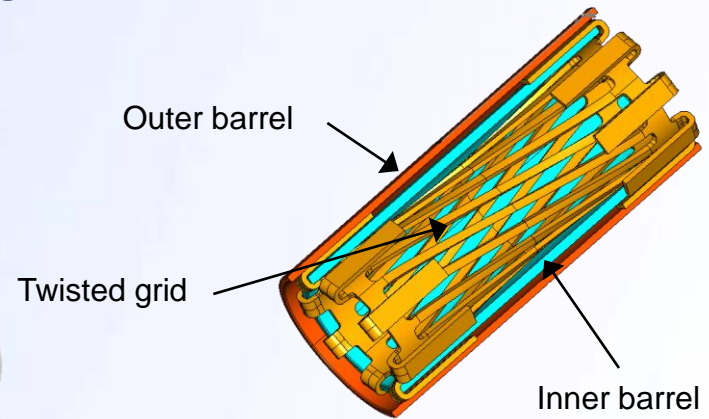


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Function explanation – Differences between old and new RADSOK

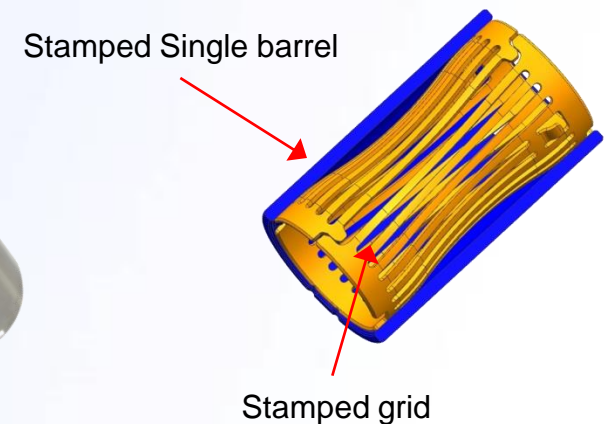
▶ Current Radsok (R2) : Main Benefits:

- ▶ Excellent current transfer in small packaging
- ▶ Durability
- ▶ Low assembly force

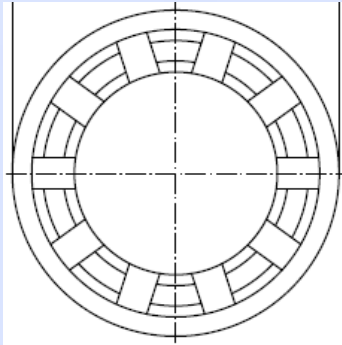


▶ Radsok Next Generation (R8S)

- ▶ Smaller, lighter than R2
- ▶ Higher current capability
- ▶ Reduced cost

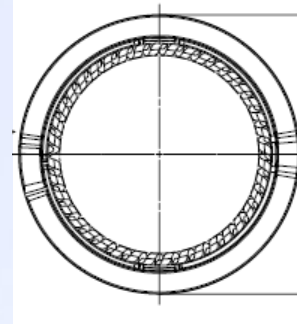
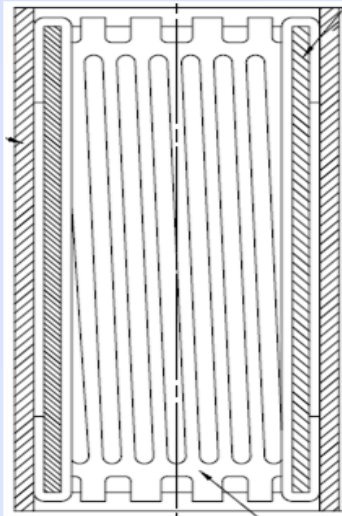


Function explanation – Differences between old and new RADSOK



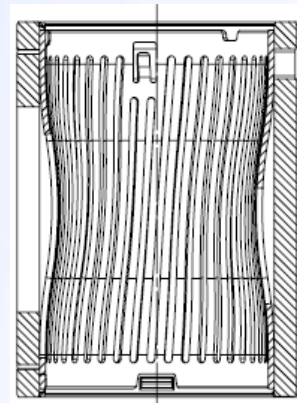
RADSOK R2 (old)

- Good performance
- **Three Parts**
- Fixed bearing on both sides between Grid and inner/outer Barrel
- $T_{max}=150^{\circ}C$
- Grid material: CuCoBe-Alloy
- Production Technology: Assembly machine
- **Cost intensive**

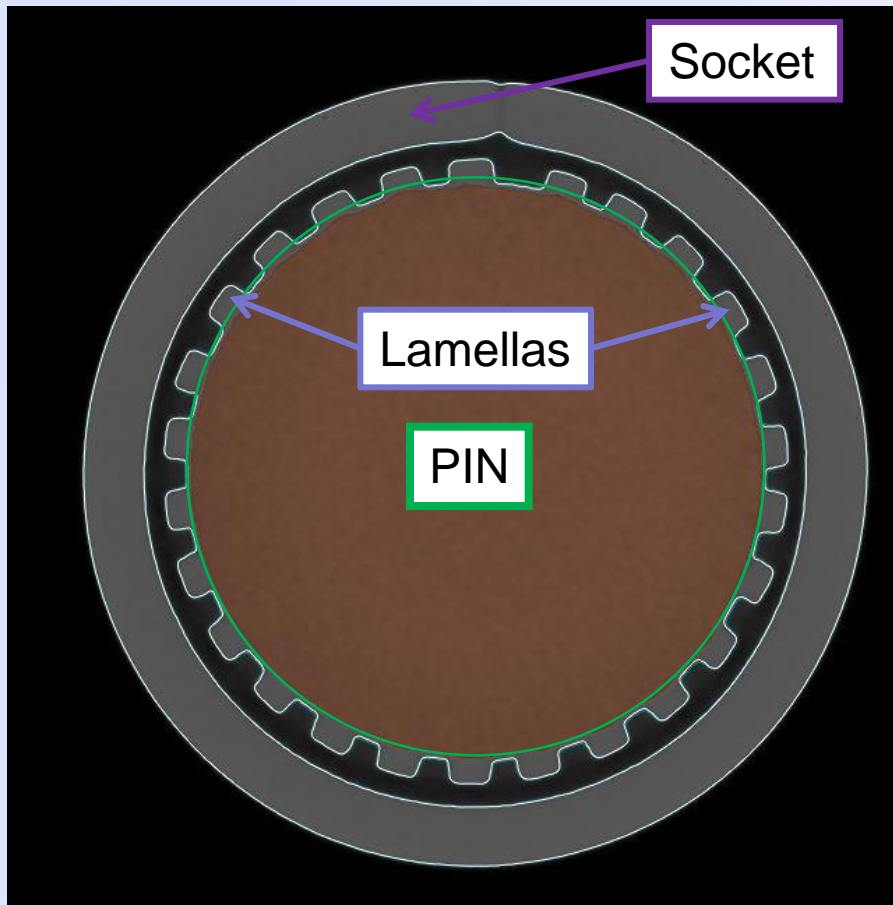


RADSOK R8S (new)

- Better performance than old RADSOK due to the new Grid material
- **Two parts**
- Reduction of length and high
- Very low weight
- Floating Grid in Barrel
- $T_{max} = 170^{\circ}C$
- Grid material: Copper Alloy w/o Beryllium
- Production Technology: high precision Stamping and Bending process
- **Cost optimized**

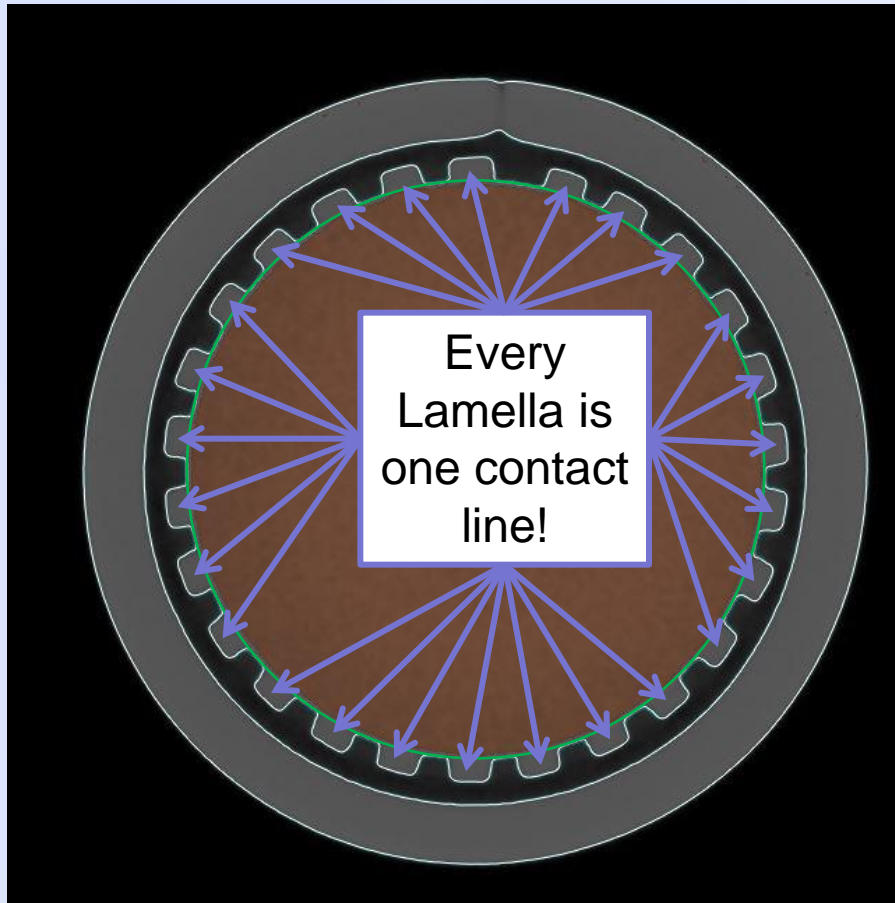


Function explain – RADSOK general – Mating Force

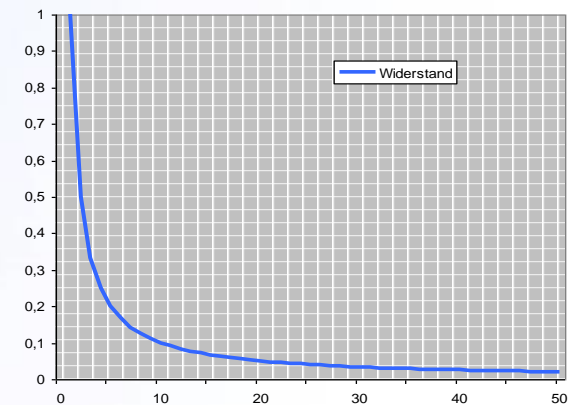


- ▶ **100 % defined contact between Grid-lamellas and Pin**
- ▶ **Very good abrasion resistance due to defined edges of lamellas**
- ▶ **Contact lines with a lot of contact points**

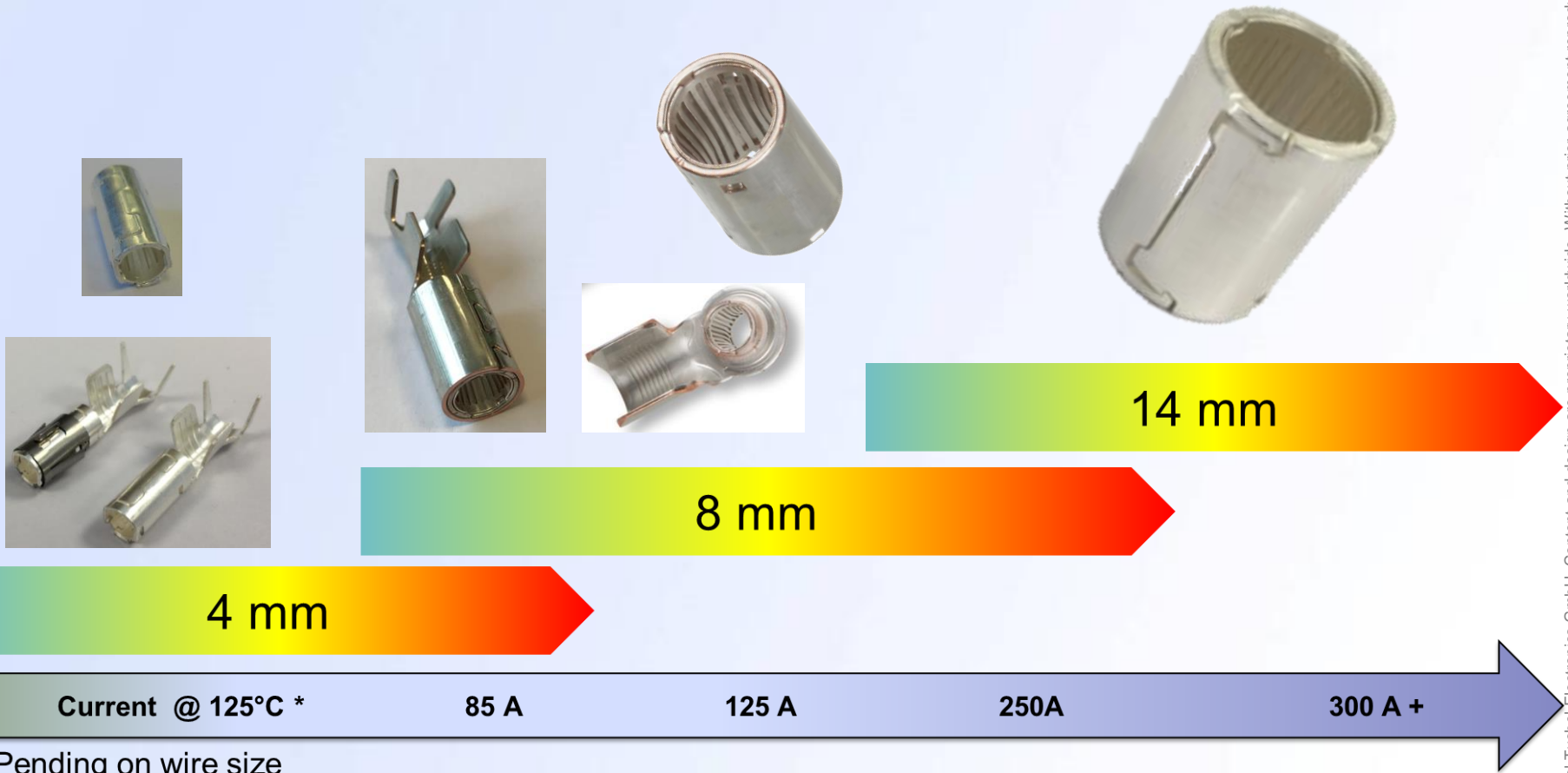
Function explain – RADSOK general – Contact resistance explain



- ▶ Every lamella is one contact line and every contact line has much contact areas.
→ **Very low resistance due to the parallel connection !**



Function explanation – Radsok Size



► Other sizes coming soon (12mm, 6mm)

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4mm RADSOK R8S



Versions of 4mm – RADSOK R8S



- ▶ **Single contact for different applications in Automotive- and Industry sector**

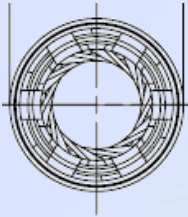


- ▶ **Crimp contact 180° with or without locking spring for cable sizes of 4, 6 and 10mm² (further sizes possible)**

Technical details 4mm – RADSOK ↔ RADSOK R8S



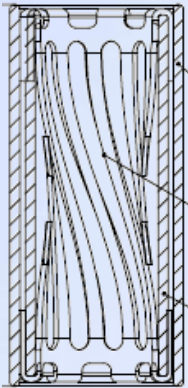
RADSOK R2



D: 6,00mm
L: 13,20mm

Assembly:
Grid, inner sleeve,
outer sleeve

Materials:
Barrel: Cu-ETP (Ag)
Grid: CuCoBe (Ag)



RADSOK R8S



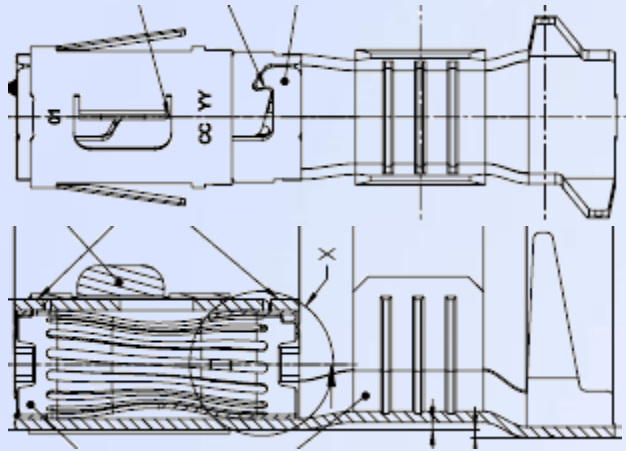
D: 6,00mm
L: 13,15mm

Assembly:
Grid, outer sleeve

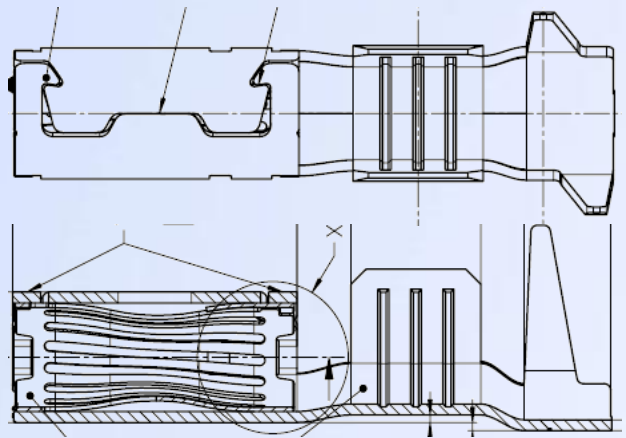
Materials:
Barrel: Cu-FEP (Sn)
Grid: Copper Alloy (Ag)



Technical details 4mm – RADSOK R8S



With Locking-Sprig



W/O Locking-Sprig

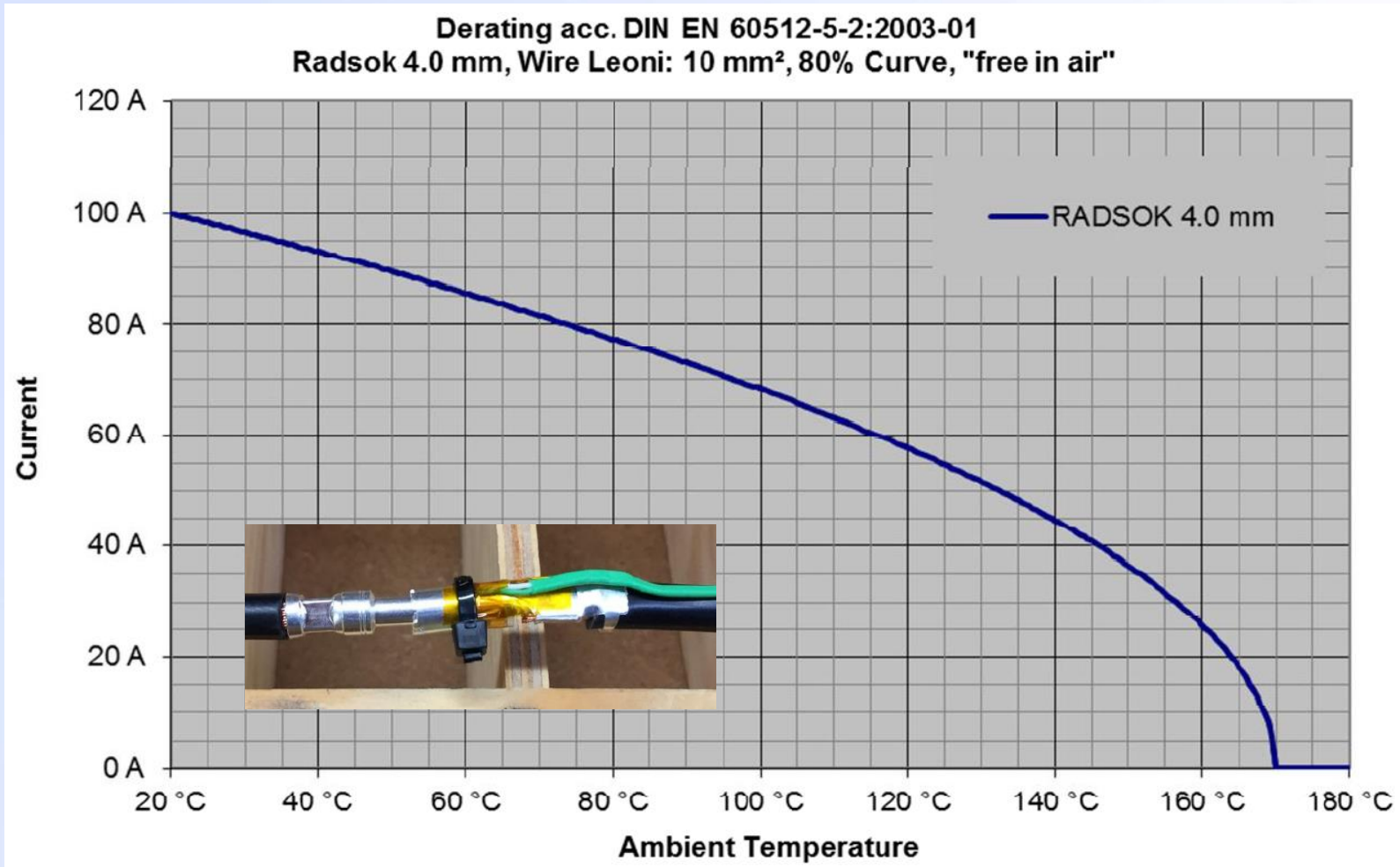
D: 6,00mm
L: 27,65 mm



Assembly:
Grid, outer sleeve

Materials:
Barrel: Cu-FEP (Sn)
Grid: Copper-Alloy (Ag)
Locking Spring: stainless steel

Technical details 4mm (B-samples) – RADSOK R8S



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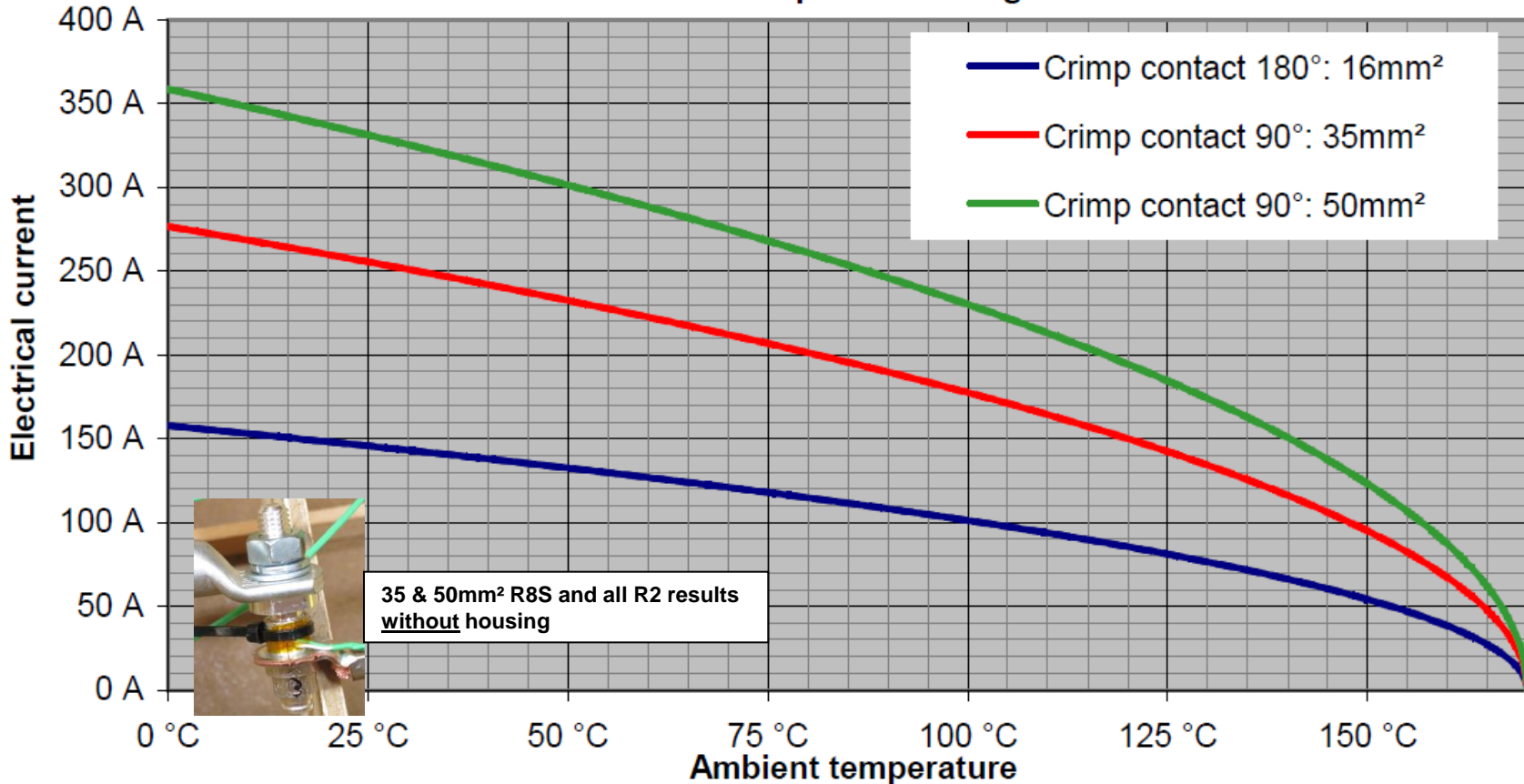
8mm RADSOK R8S



Deratings



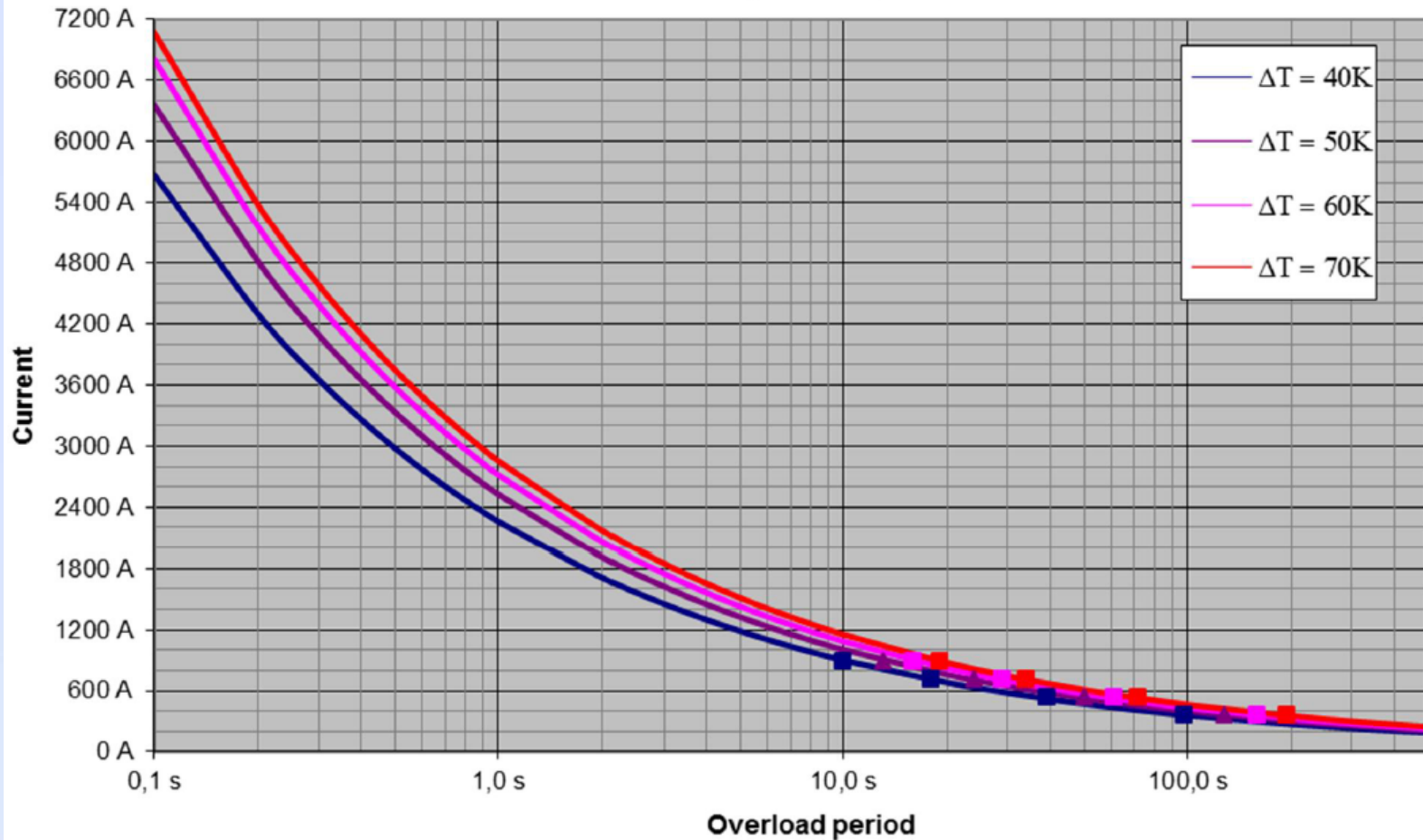
Current derating acc. to DIN EN 60512-5-2
Radsok R8S 8mm: compared derating results



Dynamic Deratings – 8mm RADSOK Crimp Contact R8S 35mm²



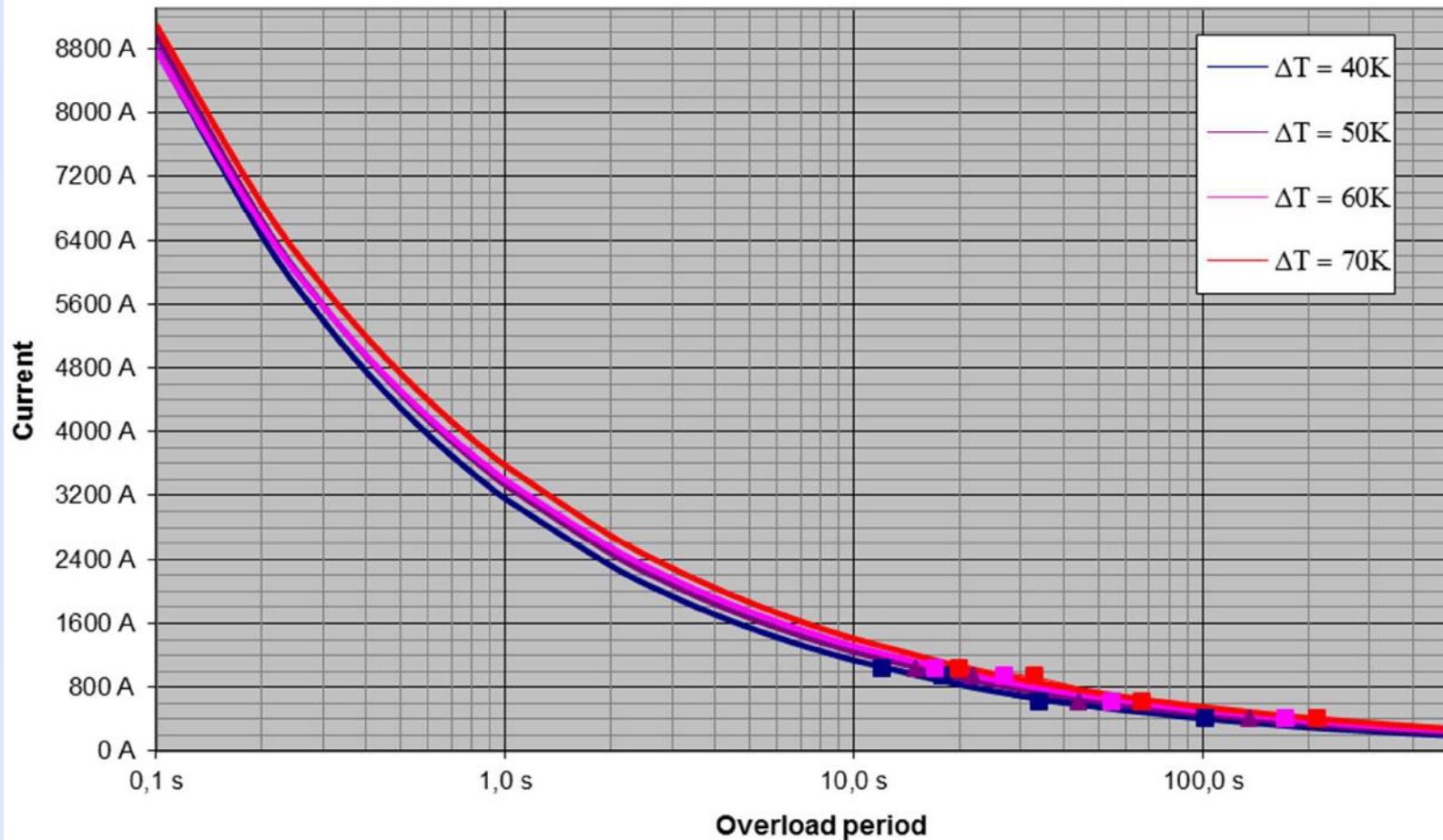
VW 75174:2010-04, PG14 Thermal time constant without housing, "free in air"
8mm RADSOK NG crimp to 35qmm wire H+S



Dynamic Deratings – 8mm RADSOK Crimp Contact R8S 50mm²



VW 75174:2010-04, PG14 Thermal time constant without housing, "free in air"
8mm RADSOK RNG crimped to H+S 50qmm wire

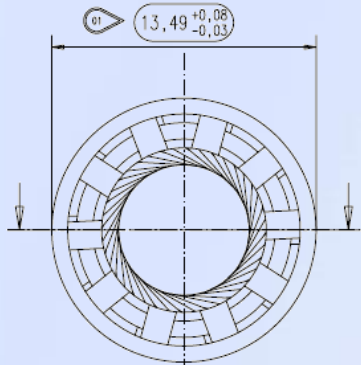


Differences –

RADSOK ↔ RADSOK R8S



RADSOK

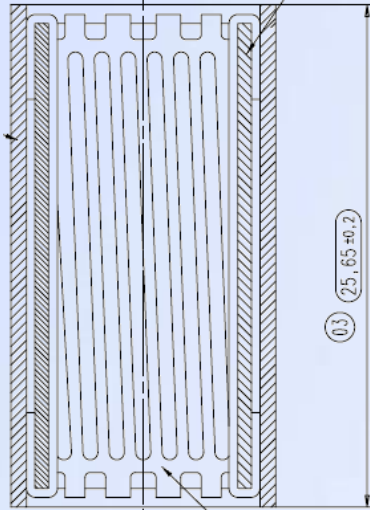


D: 13,49mm
L: 25,65mm

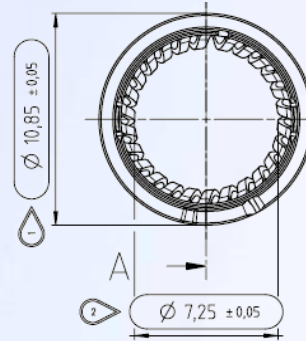
Assembly:
Grid, inner barrel,
outer barrel

Materials:
Barrel: Cu-ETP
Grid: CuCoBe

Weight:
15,1 g



RADSOK R8S

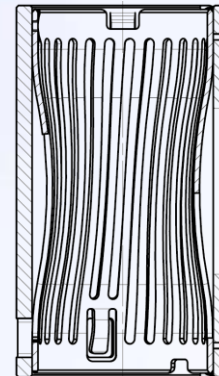


D: 10,85mm
L: 19,00mm

Assembly:
Grid, outer sleeve

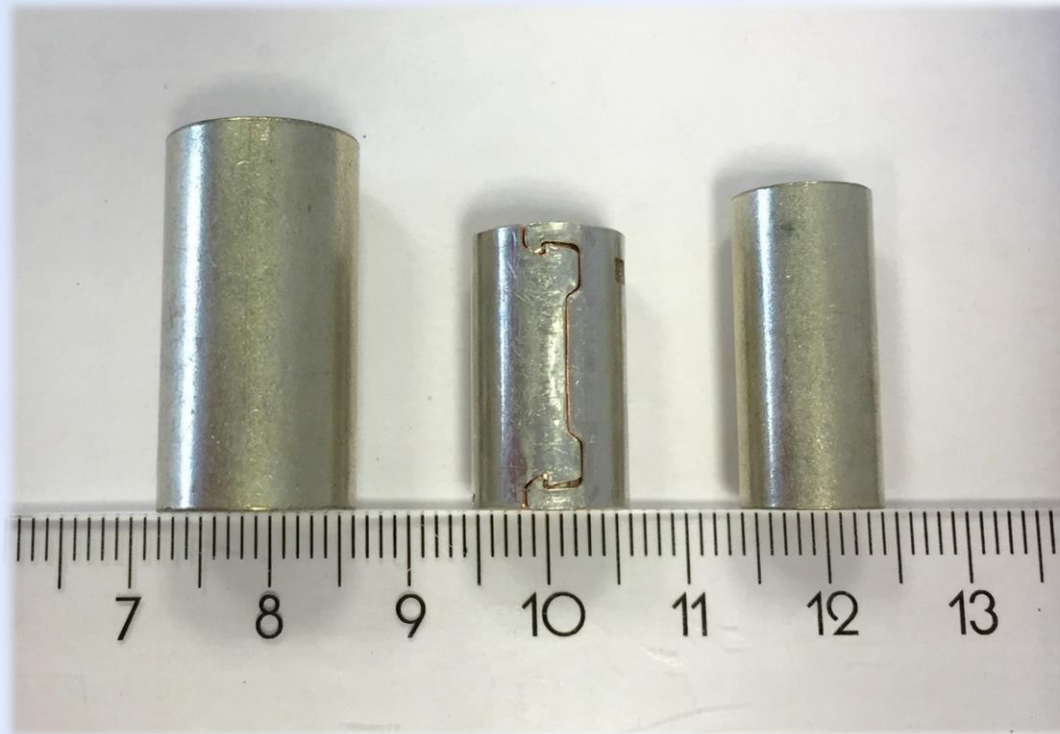
Materials:
Barrel: Cu-OF (Sn)
Grid: Copper Alloy (Ag)

Weight:
5,3 g



Comparison:

Current 8mm RADSOK ↔ 8mm RADSOK R8S



current
8mm
RADSOK

RADSOK R8S
8mm

current
6mm
RADSOK

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14mm RADSOK R8S

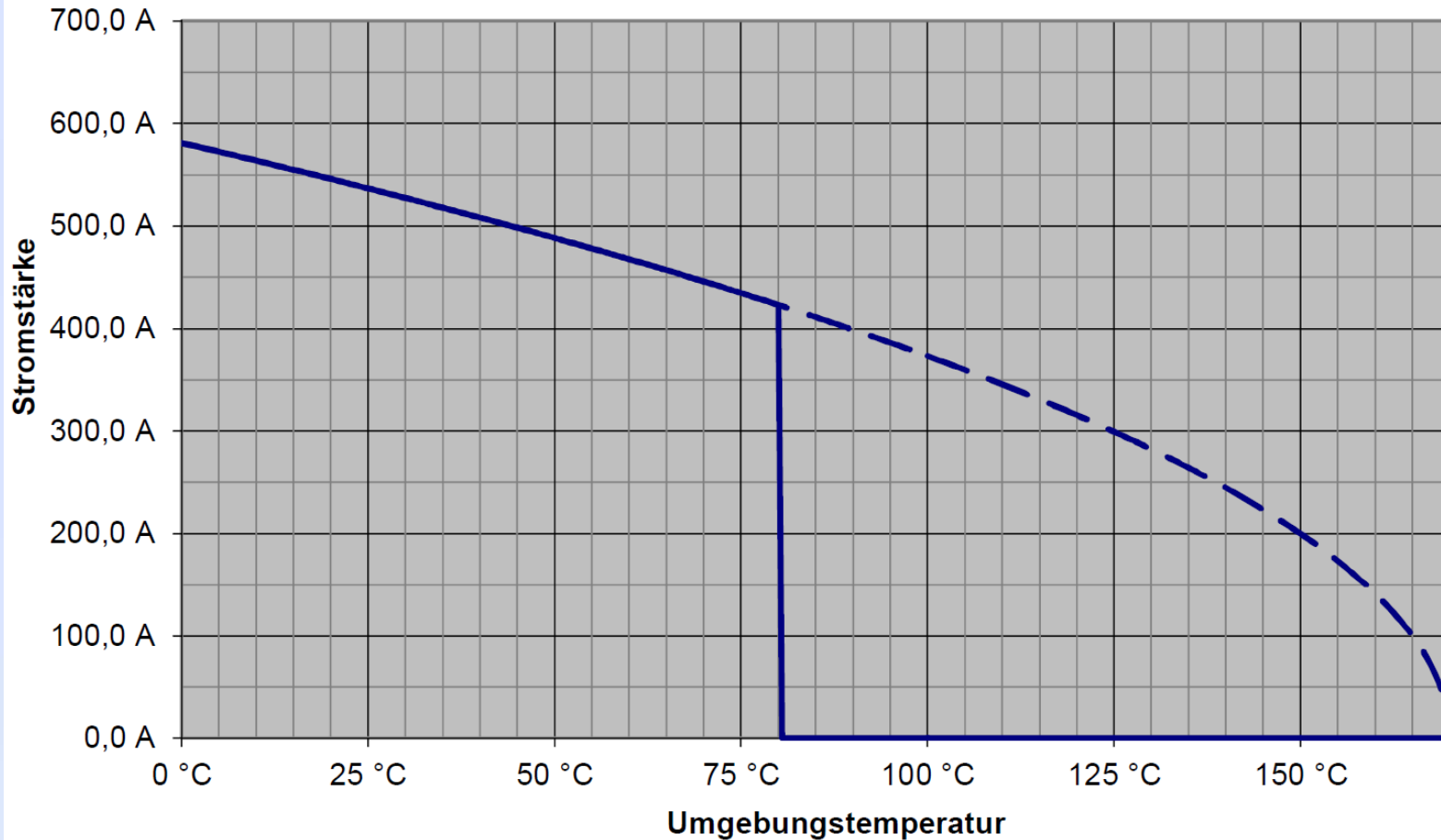


Deratings –

14mm RADSOK R8S (B-samples) laser welded with 120mm² crossection



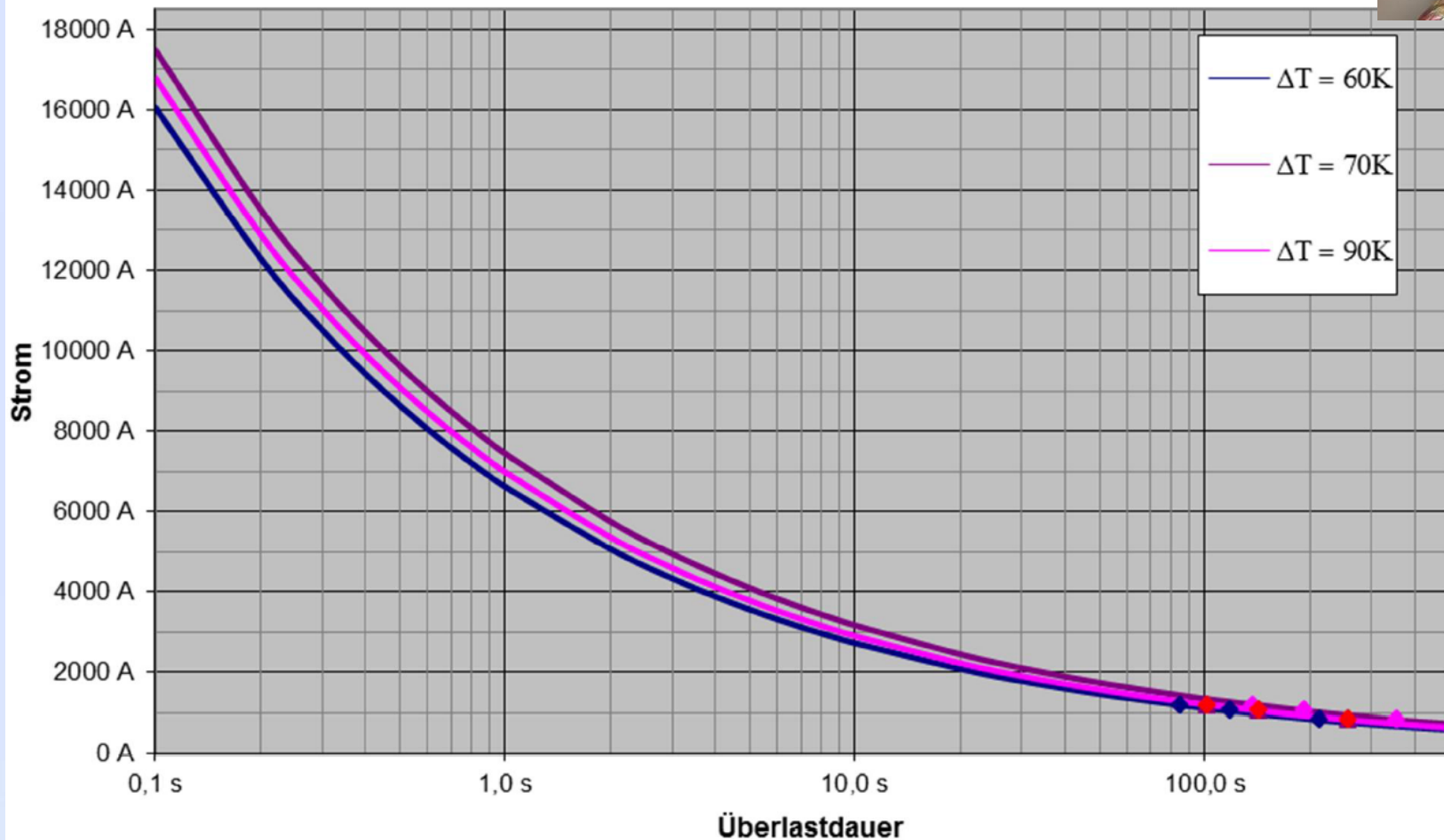
Strombelastbarkeit nach DIN EN 60512-5-2
Radsok 14mm, 120mm² Leitung, geschweißte Litzen



Dynamic Deratings – 14mm RADSOK R8S laser welded with 120mm² crossection



LV 214, PG14 Thermische Überlast ohne Gehäuse, "frei in Luft"
14 mm RADSOK NG mit 120mm² Kupfergeflecht Leitung

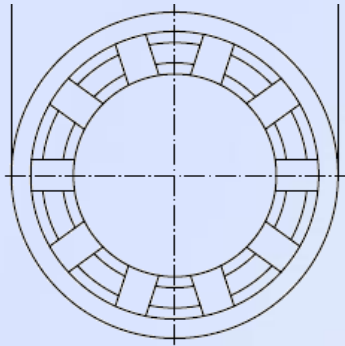


Technical details 14mm –

RADSOK ↔ RADSOK R8S



RADSOK R2

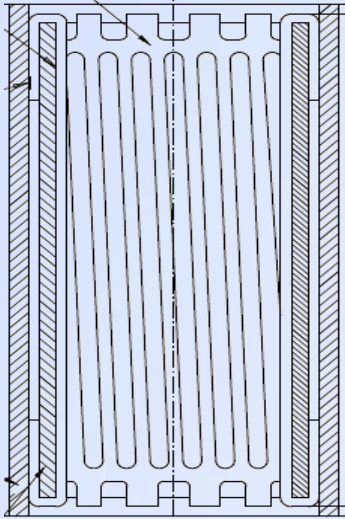


D: 22,69mm
L: 34,00mm

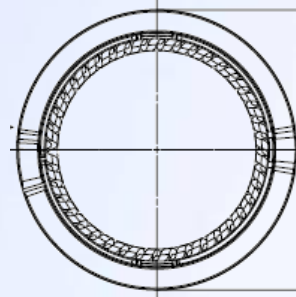
Assembly:
Grid, outer sleeve

Materials:
Barrel: Cu-ETP (Ag)
Grid: CuBe (Ag)

Weight:
53,6 g



RADSOK R8S



D: 18,65mm
L: 25mm

Assembly:
Grid, outer sleeve

Materials:
Barrel: Cu-OF (Sn)
Grid: Copper Alloy (Ag)

Weight:
20,4 g

