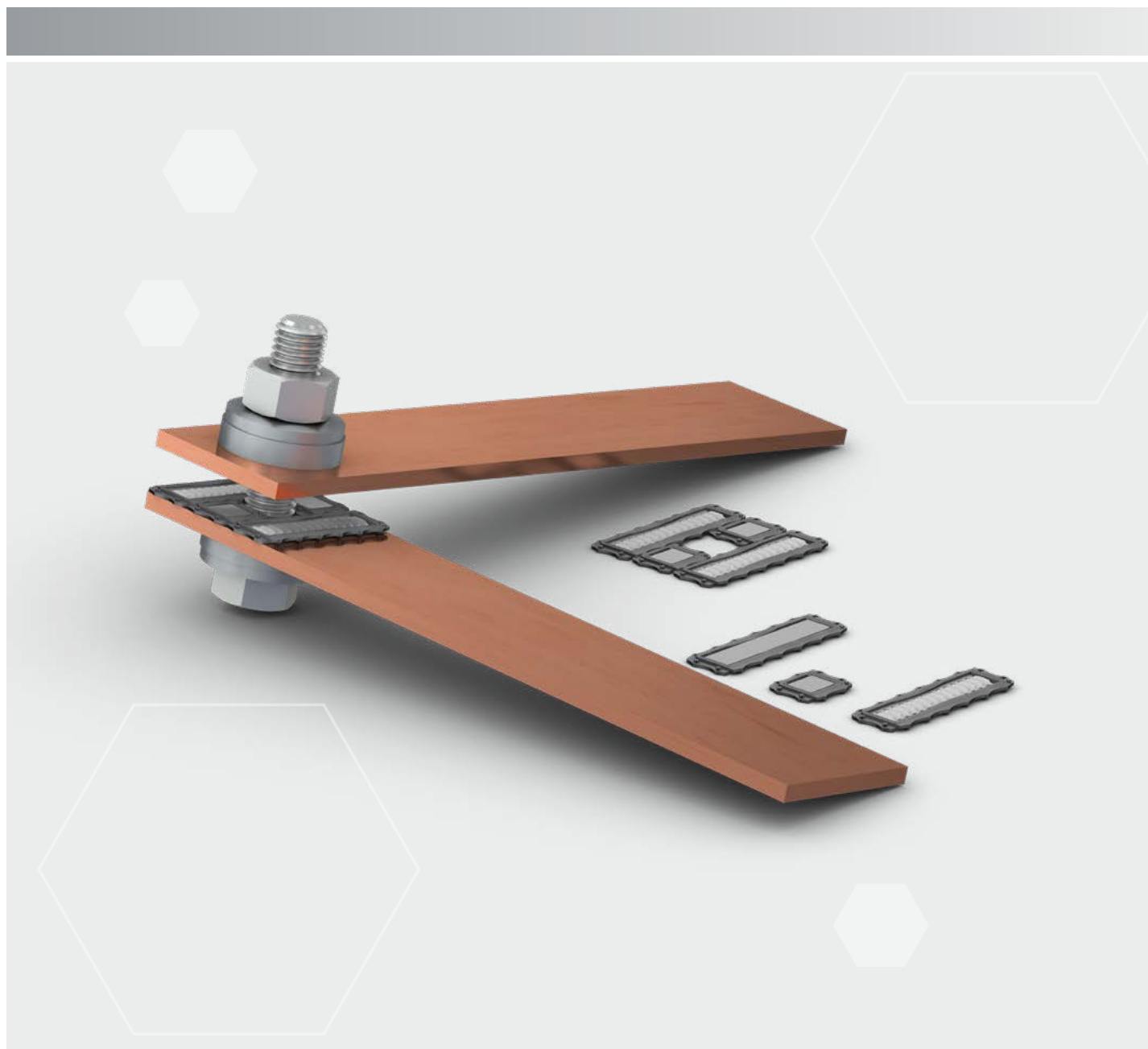


# Connecting element MC-SEALconTACT

MULTILAMTechnology | MULTILAM



## STÄUBLI ELECTRICAL CONNECTORS

## Long-term solutions – Expert connections



**Stäubli Electrical Connectors is a leading international manufacturer of high-quality electrical contacts and connector systems and solutions for industrial applications. We are part of the Stäubli mechatronics group, the technology leader in connection solutions, robotics and textile machinery.**

Stäubli develops, produces, sells and services products for markets with the highest productivity and safety standards. As recognized specialists, our focus is always on solutions and customers. Many new developments got their start here and are now becoming established as worldwide standards.

Our customers depend on our expertise and our active support, even when dealing with unusual challenges. With Stäubli, you're entering into a long-term partnership built on reliability, dedication, and exceptional quality in both products and services.

#### **Pioneering contact technology for increased efficiency**

The entire Stäubli Electrical Connectors product range meets market expectations for high performance, the highest number of mating cycles, and long-lasting reliability for safe, durable operation. Our proven **MULTILAM technology** is ideal for all types of connections in industrial applications. Customers in the **power transmission and**

**distribution** sector rely on our consistent, loss-free transmission performance in all voltage ranges. The **automotive industry** depends on our high-efficiency connections for spot-welding applications in production lines. Harsh conditions in the **transportation sector** require high vibration resistance, maximum reliability, and compact design. These attributes are vitally important for railway and e-mobility applications. The safety

and reliability of our products are essential for **test and measurement technology.**

In the growing field of **alternative energy**, our products have been setting standards since the 1990s. About half of the solar energy generated worldwide is transmitted through safe, long-lasting, high-performance Stäubli connectors.

UNLIMITED POSSIBILITIES FOR CONTACT SOLUTIONS

MULTILAM Technology



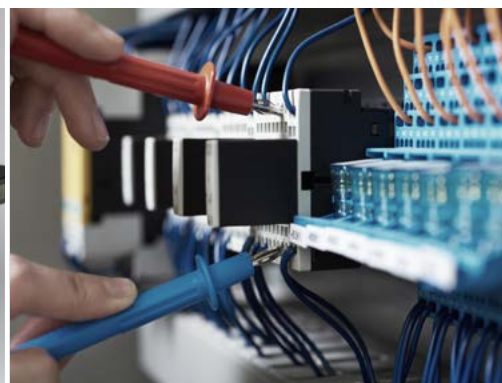
**MULTILAM** are specially formed and resilient contact elements. All Stäubli Electrical Connectors products benefit from the unique and outstanding performance of the **MULTILAM Technology**.

Thanks to their constant spring pressure, MULTILAM louvers ensure continuous contact with the contact surface, resulting in a constantly low contact resistance.

MULTILAM Technology allows to find solutions for connectors within the severest constraints and in certain products for up to 1 million mating cycles.

This makes the MULTILAM Technology the best choice for applications with demanding requirements:

- Reliable and longlife operation due to constantly high performance
- Safe operation under highest environmental demands on temperature, vibration and shock
- Suitable for data and signal contacts as well as high-current connectors
- Automated solutions with a high number of mating cycles

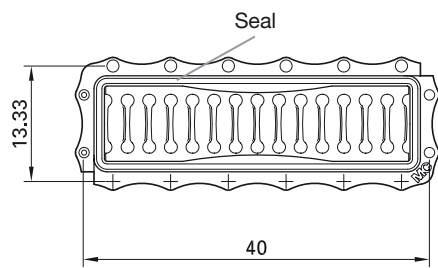


# MC-SEALconTACT

Sealed contact for high current connection of uncleaned busbars.

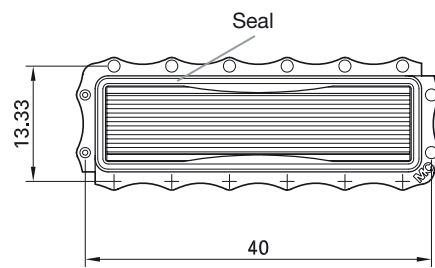
## KM SN

Contact module



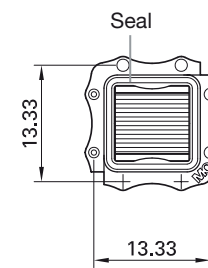
## AM-L SN

Support module, long



## AM-K SN

Support module, short



Order No.	Type	Description	Dimensions <sup>2)</sup>	Weight	MULTILAM	Compression force, min.	Continuous temperature	Rated current	Short-circuit current		
									kA		
									1s	2s	3s
71.1006	KM SN	Contact module <sup>1) 3)</sup>	40 × 13.33 × 1.4	1.26	14 louvres	6	100	800	20	16	14
71.1007	AM-L SN	Support module, long <sup>1) 3)</sup>	40 × 13.33 × 1.4	3.05	–	28	100	–	–	–	–
71.1008	AM-K SN	Support module, short <sup>1) 3)</sup>	13.33 × 13.33 × 1.4	0.8	–	8	100	–	–	–	–

<sup>1)</sup> tin plated

<sup>2)</sup> contact spacing

<sup>3)</sup> plastic frame: polyamide



Assembly instructions MA015

[www.staubli.com/electrical](http://www.staubli.com/electrical)

### Applications

- For high current transmission with busbars and plates
- Contacting of unplated, unmachined busbars and plates
- Copper/copper, copper/aluminium (alloy), aluminium (alloy)/aluminium (alloy)
- Indoor and outdoor-installations
- In corrosive atmospheres (e.g. sulphur dioxide (SO<sub>2</sub>), salt laden air (NaCl))
- Suitable for bolted joints in busbars according to DIN
- Contact element is a modular design
- Static connection only

### Features

- Energy-saving and maintenance free
- High-current transmission in hermetically sealed chambers
- No oxidation or corrosion in the chambers. Low loss over long-time use
- The contact will not worsen in an avalanche effect due to heating
- Bars do not need cleaning
- Plating not required
- The torsion spring louver of the MULTILAM permits the contact force as well as the electrical performance of the busbar joint to remain constant even when the compression force drops to 50 % of its initial value
- Economics of the installation: low resistance factor over a long period of time (stable long-term behaviour), minimum energy losses
- Busbar joints do not need any servicing
- High operating reliability
- Substantially prolonged service life
- Easy do-it-yourself assembly

### Notice:

In a corrosive atmosphere and with combinations of different materials, in order to prevent corrosion potential differences should not exceed 350 mV. Silver-tin and silver-aluminium combinations should be avoided in a corrosive atmosphere. Also see Technical Report IEC 60943:1998-01.

MC-SEALconTACT are suitable for unplated or plated connections Cu/Cu, Cu/Al alloys or Al alloys/Al alloys (e.g. AlMgSi0.5, EN-AW6060).

The busbar material and application should be stated in any inquiries or orders for MC-SEALconTACT.

### Attention:

MC-SEALconTACT must not be used in connections with Cu/pure aluminium or pure aluminium/pure aluminium (e.g. with E-Al99.5, EN-AW1350) with or without electroplating. The contact resistance of a connection with MC-SEALconTACT can rise rapidly, resulting in marked heat generation.

# Fundamental principles

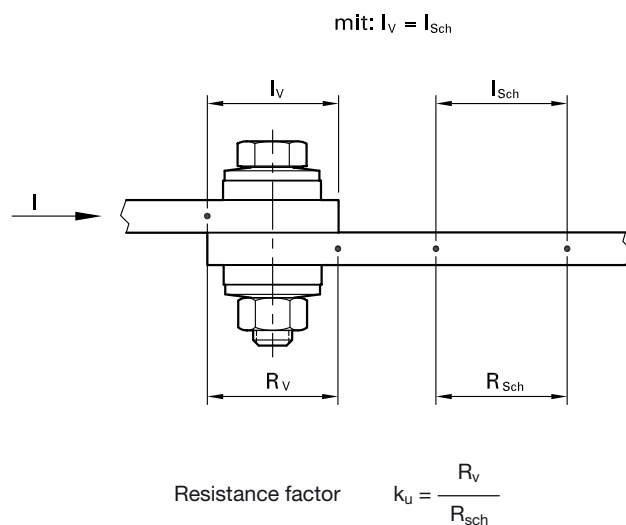
Flat contact surfaces e.g. two overlapping busbar connections do not ensure a reliable current transmission due to the fact that there are very few defined contact points over the surface. These few points heat up at high current. The higher temperature accelerates the oxidation, which in turn impairs the contact points until a contact failure occurs. Both the electrical and mechanical requirements have to be considered when making busbar connections.

MC-SEALconTACT guarantees an optimal current transmission with low, and stable contact resistance.

## MC-SEALconTACT and the Resistance factor

Bolted busbar joints with MC-SEALconTACT provide economical power transmission. A resistance factor  $k_U = 1$ , means that the power loss in the joint is no higher than in an equally long section of busbar (see illustration).

$k_U = 1$  is an excellent joint technically, and therefore economically as well. Joints without MC-SEALconTACT suffer an increasing resistance factor after only a few months. Those made up with MC-SEALconTACT display a constant resistance factor for many years (depending on the application). See diagram page 7.

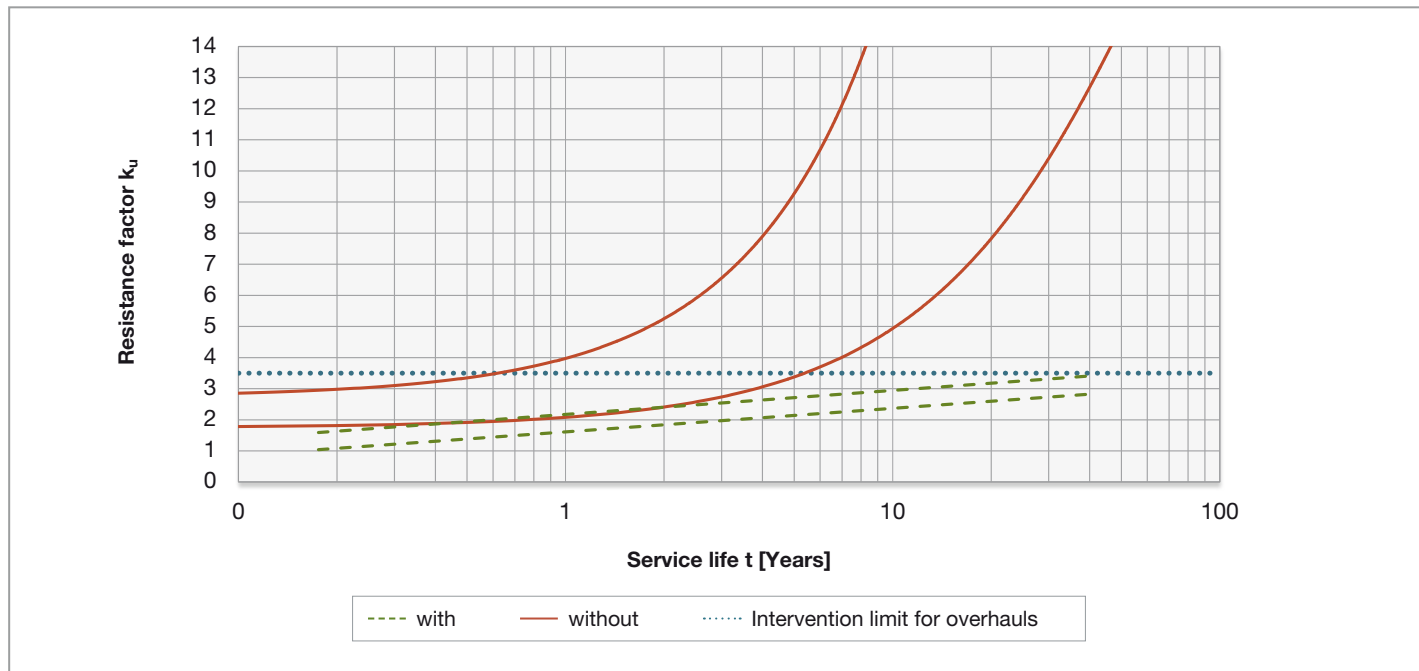


The grooved supporting modules bring the MULTILAM to the optimum deflection height and protect them from destruction. At

least 2 supporting modules must be used. The exact number of supporting modules depends on the application. In the event of

space problems an appropriate slot can be used.

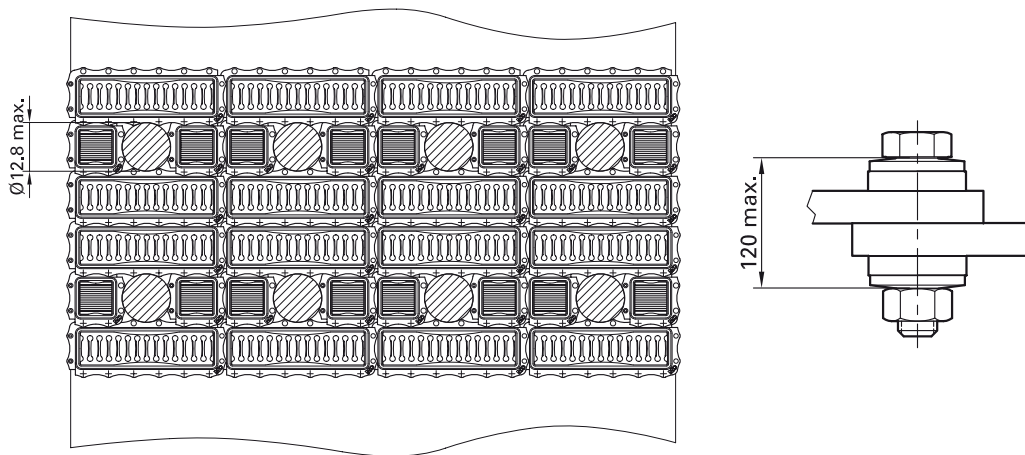
### Long-term resistance factor $k_u(t)$



### Application examples

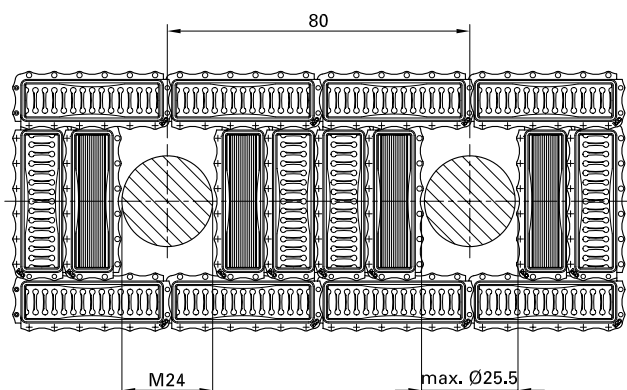
Standard MC-SEALconTACT 40 mm × 40 mm	
Tightening torque with lubricated bolts	60 Nm
Thread diameter	M12
Maximum clamping length for screws of property class 8.8 or more	120 mm

### Busbars DIN 43673-6-160-13,5



If possible design the busbars and plates to suit the standard MC-SEALconTACT elements.

# Fundamental principles



## Notice 1

With existing configurations not initially designed for the standard MC-SEALconTACT, the

- Tightening torque
- Thread diameter
- Bolt length
- Bolt spacings

are to be defined according to the compression force of the contact and support

modules (page 4).

## Notice 2

1. The relevant DIN or other national standards should be referred to, in particular the current loading of the busbars.
2. The assembly instructions are to be observed.

## Customer:

ABB, Semiconductors, Switzerland

## Application:

Outdoor permanent contact (AlCu) to a reactance coil.



Assembly instructions MA015

[www.staubli.com/electrical](http://www.staubli.com/electrical)



# Technical Papers on MC-SEALconTACT, 1995:

Long-term Behaviour of Bare, Bolted Busbar Joints with and without the Contact Element, MC-SEALconTACT. Use of the contact ele-

ment, MC-SEALconTACT, reduces electrical losses, prolongs service life and enhances the reliability of the entire installation.

## Test arrangement

- AlCu connections, uncleaned, cleaned
- Al, 40 mm × 10 mm
- E Al Mg Si 041, bare, DIN 1725
- Cu, 40 mm × 10 mm, Cu ETP, bare, DIN 1787

## Tests

### Long-term testing

- indoors
- outdoors

### Ageing tests (Accelerated time tests)

- Relaxation of bolt force
- Temperature shock
- Salt mist

## Conduct of tests

### Technical University Dresden

Department of High Voltage and High Current Engineering

### Fachhochschule für Technik und Wirtschaft Berlin

Department of Electrical Engineering / Cable and Connection Technology

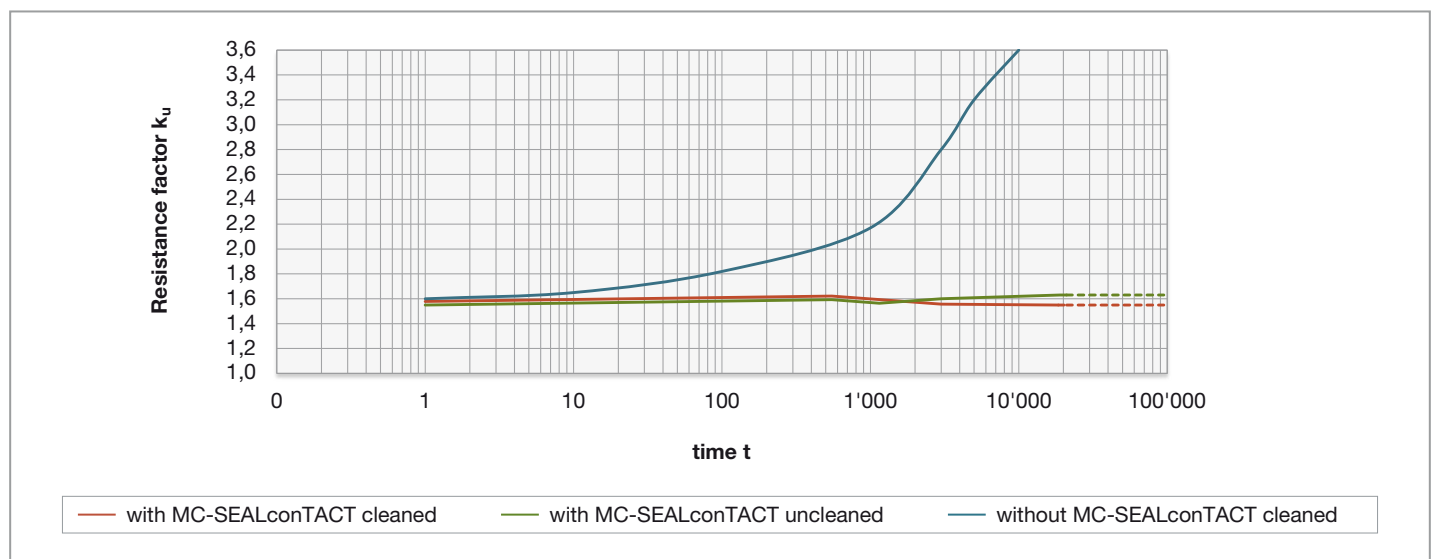
## Test results

### Long-term testing

#### Indoors

I = 800 A, T<sub>v</sub> = 90 °C

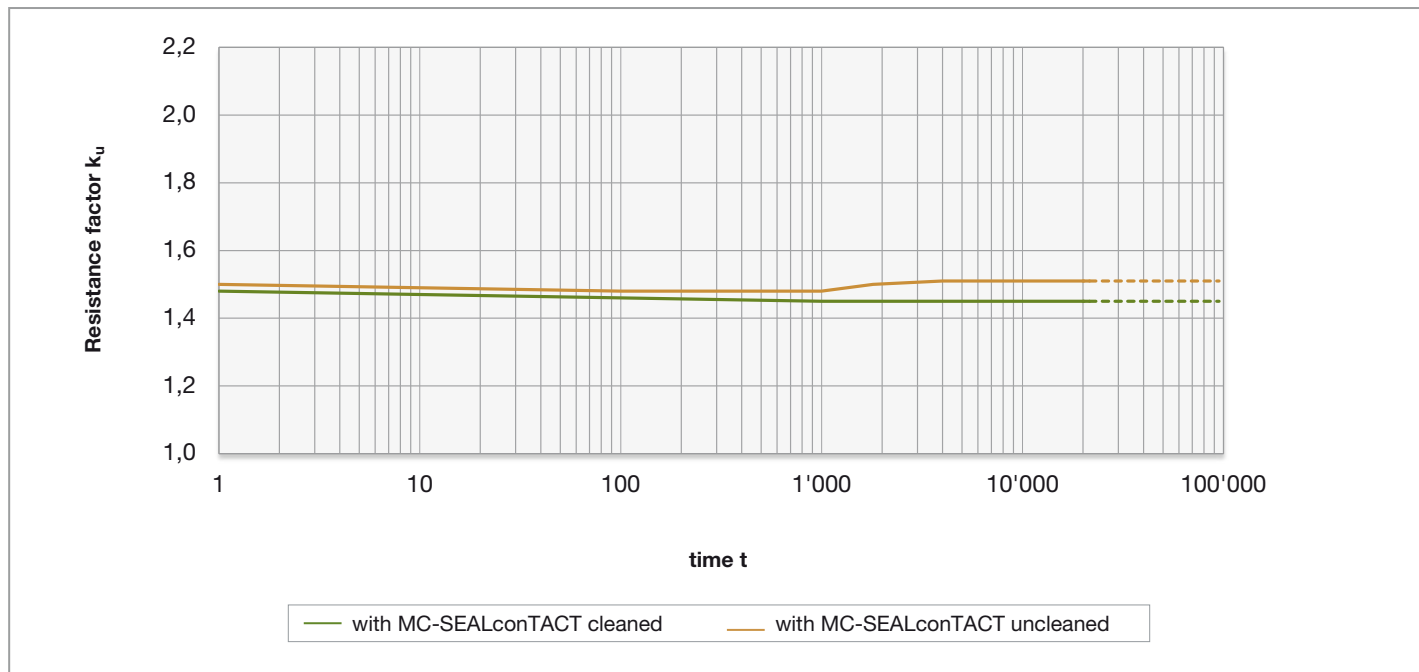
Duration t = 19,787 hours (approx. 27 months)



**Outdoors**

I = 535 A;  $\Delta T_v = 10$  K

Duration t = 21,530 hours (approx. 29 months)

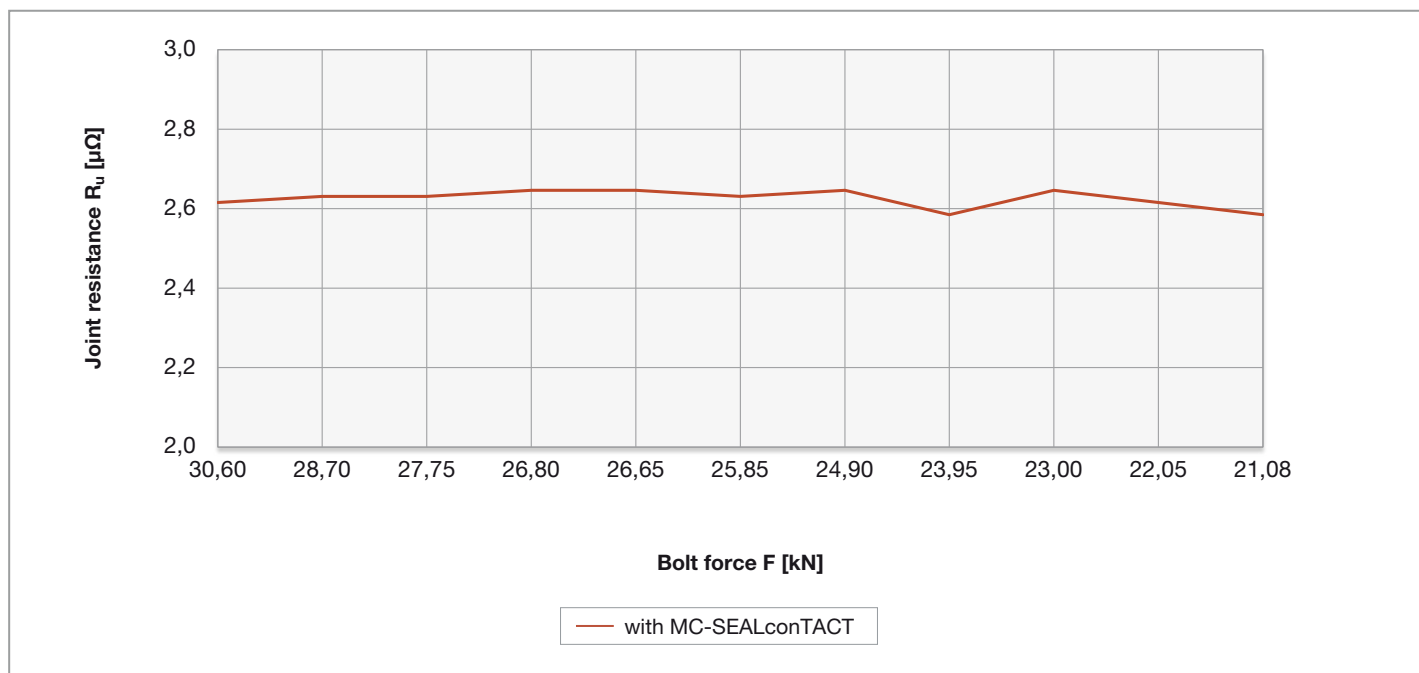


**Ageing tests (Accelerated time tests)**

**Relaxation of bolt force**

Duration t = 1,000 hours

Ambient temperature; Average value from 4 test samples

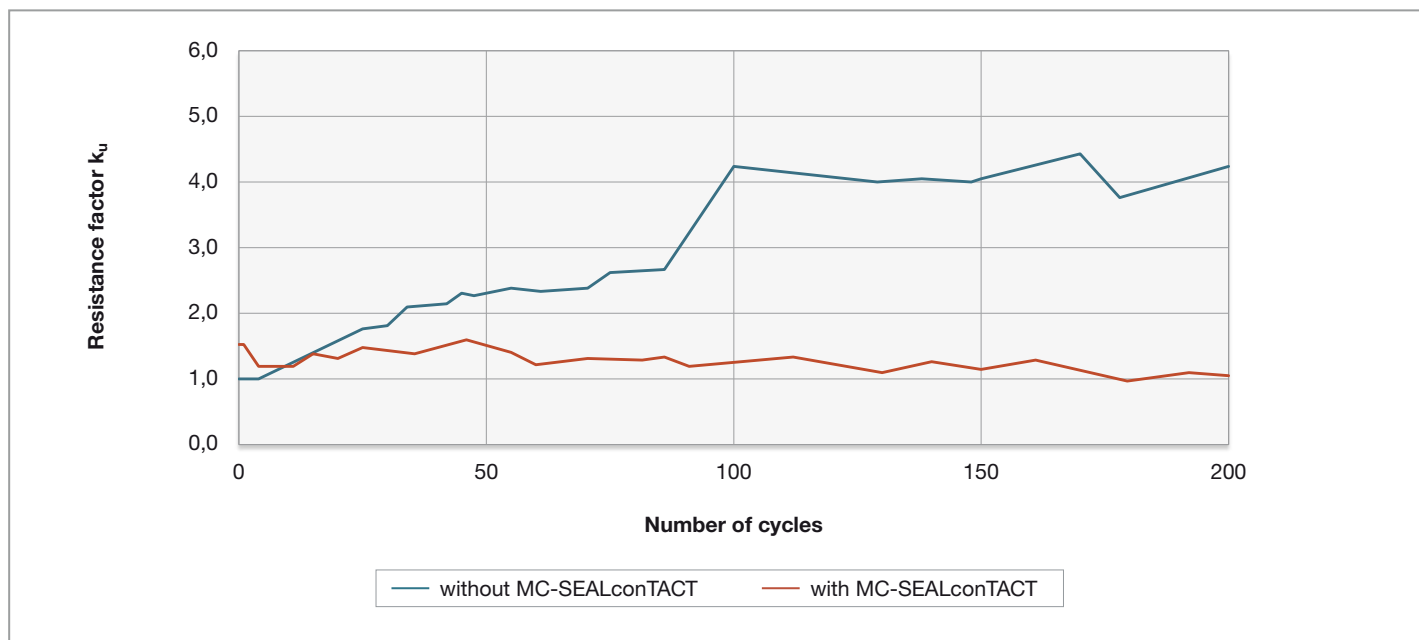


**Temperature shock**

Temperature range +180 °C...-40 °C, 200 cycles

1 cycle: 30 min. +180 °C, 30 min. -40 °C

Average value from 10 test samples



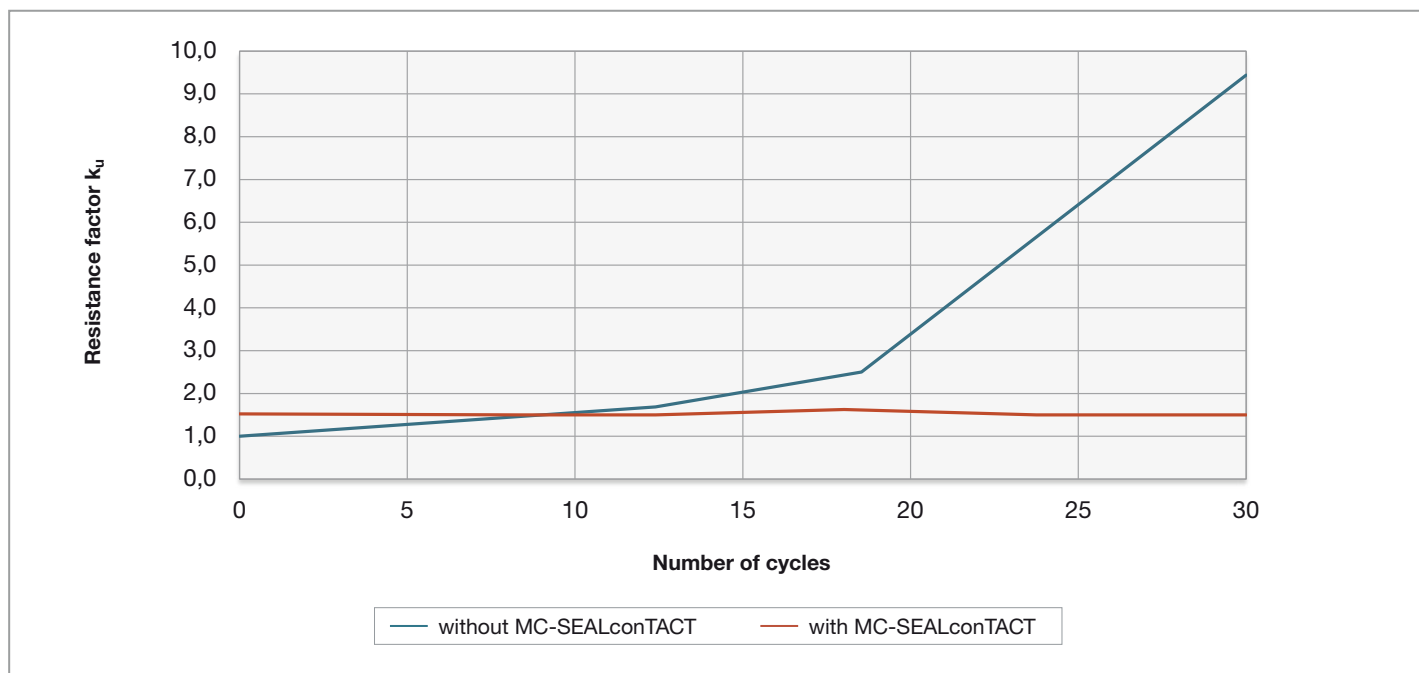
**Salt mist**

IEC 68, Part 2 – 52

Degree of corrosiveness 2, 30 cycles

1 cycle: 24 hours

Average value from 10 test samples





■ Stäubli Units    ○ Agents

# Global presence of the Stäubli Group

[www.staubli.com](http://www.staubli.com)