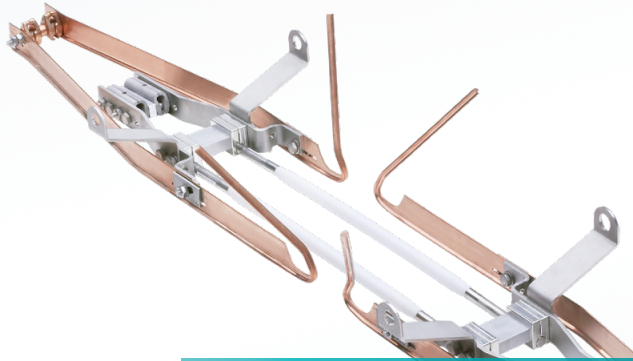


SIEMENS

Ingenuity for life



Lightweight section insulator

Sicat 8WL5545 for overhead contact line systems

[siemens.com/rail-electrification](https://www.siemens.com/rail-electrification)

The lightweight section insulators of the product line Sicat® 8WL5545 are designed for separating overhead contact line systems into individual switch and feeder sections accessible by pantographs and to insulate these sections electrically from each other.

They are used for overhead contact line systems in mass transit and in main-line railways.

Features

- Universally applicable for many national and international contact wire types
- Types for one or two contact wires
- Easy installation due to low weight and simple geometric design
- High service life due to very good arc extinguishing capability
- Low life cycle costs due to use of corrosion resistant materials
- Optimum running behaviour of pantograph due to effective adjusting device

Design

The lightweight section insulators Sicat 8WL5545 consist of the following main components:

- Contact wire dead-end clamps
- Suspension strap
- Runners with arcing horn
- Insulating rod
- Stabilizing strap (depending on type)
- Interception strap

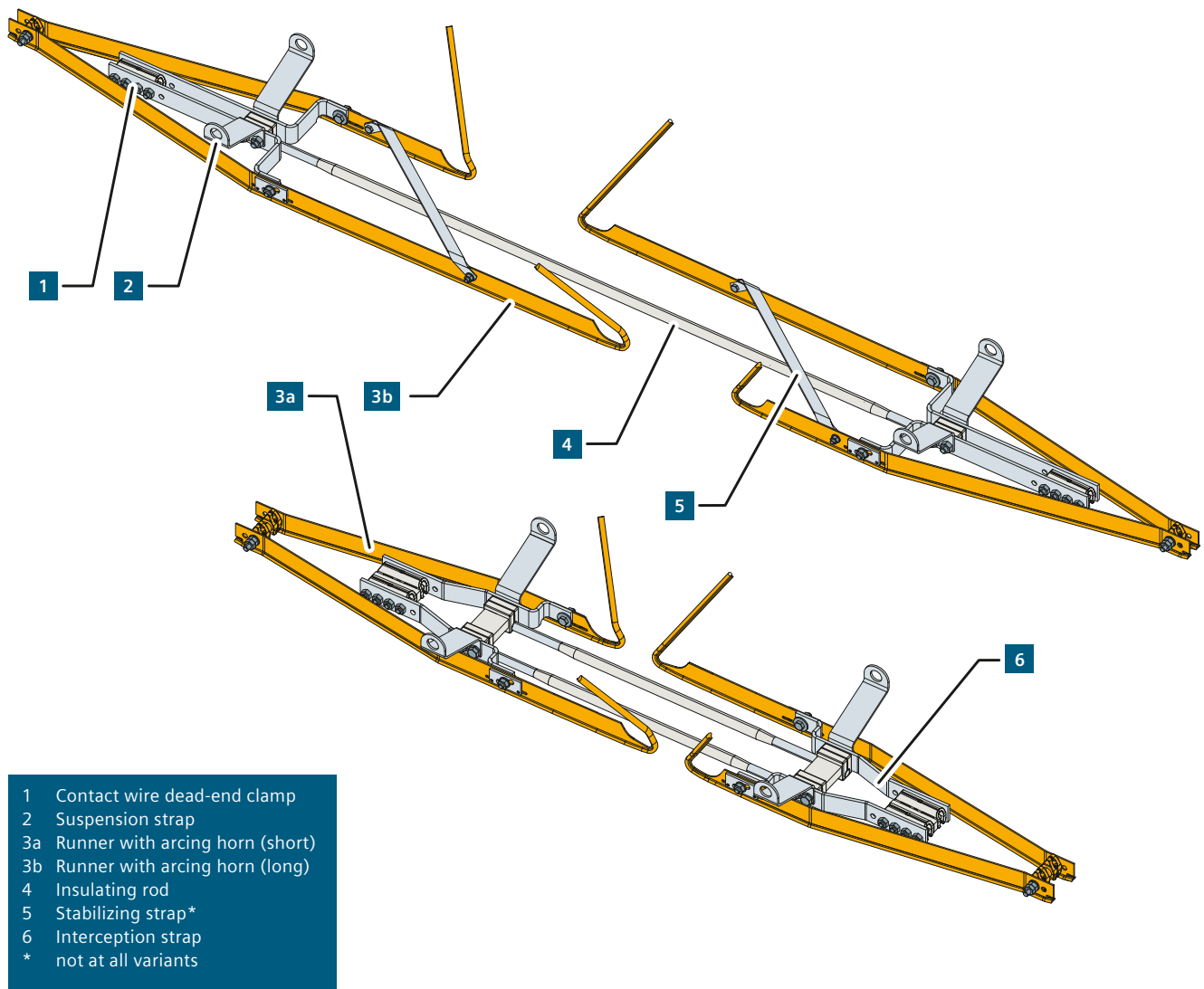
The mounting of the insulating rods at the same height as the contact wire rules out bending torques at the section insulator. The insulating rods are contacted by the pantograph in the area of clearances in air.

Due to the modular design it is possible to easily and quickly replace spare parts and accessories.

Variants

Lightweight section insulators are available in different designs. They vary in:

- Number of insulating rods and the resulting maximum operating load
- Length of insulating rods, the corresponding creepage distance and the resulting permitted nominal voltage
- Use of stabilizing straps for stabilization
- Number and distance of contact wires to be connected
- Clearance in air between runners



Design with one insulating rod and for one contact wire (Sicat 8WL5545-3A, above, for 25 kV AC) and with two insulating rods and for two contact wires (Sicat 8WL5545-8AC, below, for 3 kV DC)

Application and use

Lightweight section insulators can be employed for the electrical insulation of the contact line in main tracks, between main tracks and sidings and also for section insulation or, in pairs, as phase lock or separation system.

Depending on the pantographs, overhead contact line types, and suspensions used, the lightweight section insulators can be passed by electric-powered trains running at a maximum speed of up to 200 km/h.

Excellent arc extinguishing capability

Arcing on the section insulators, arising as the result of commutation processes, is quickly and effectively extinguished on lightweight section insulators. This results in combination with the high corrosion resistance in a long service life.



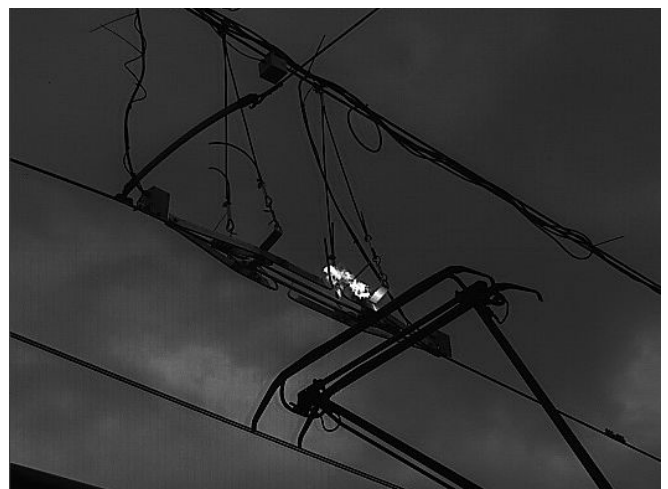
① Time -7 ms : Uninterrupted contact before commutation process



② Time 0 ms: Demolition arc is ignited



③ Time 6 ms: Arc is burning



④ Time 27 ms: Arc is extinguished

8WL5545-7A in a 750 V DC overhead contact line for trams, current at trespassing: 1,300 A (running direction from left to right)

Selection criteria and technical data

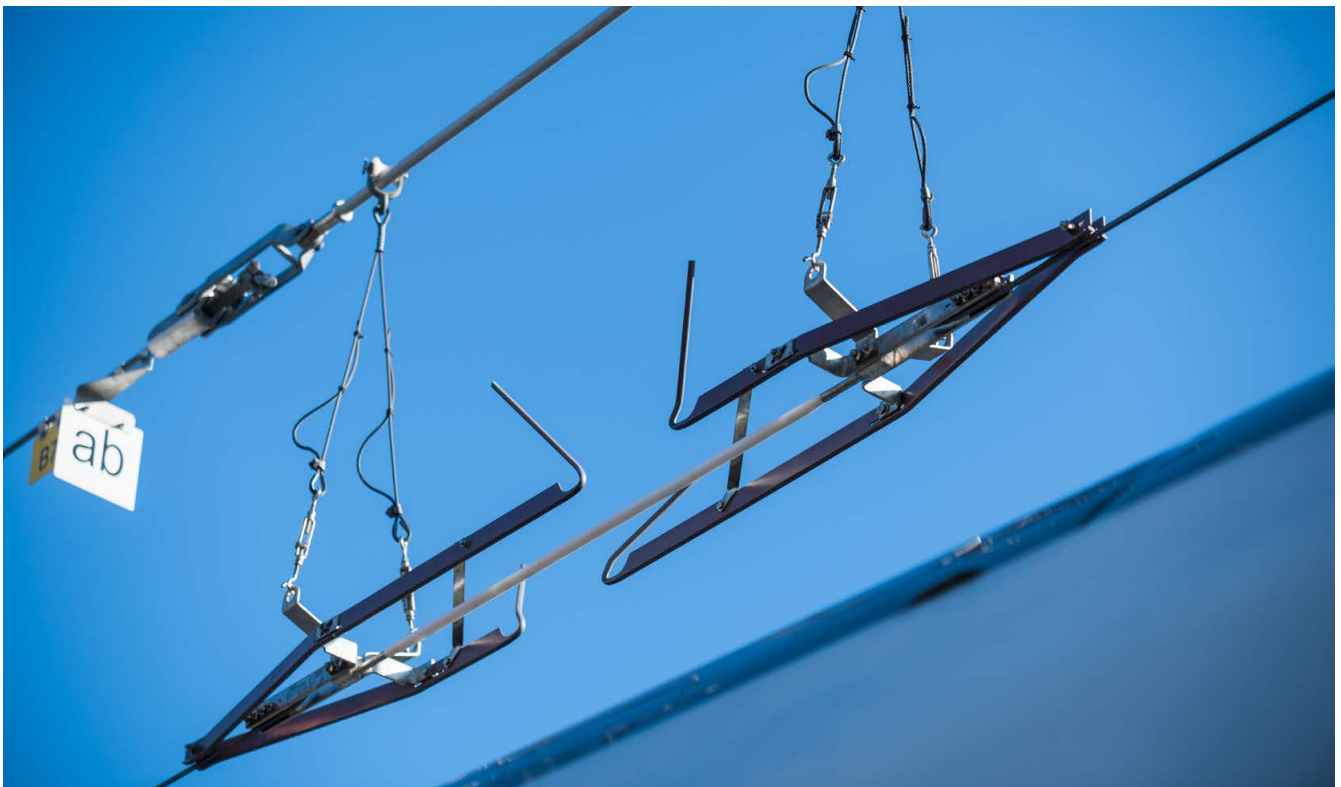
General technical data

General technical data			
Nominal voltage		[kV DC] [kV AC]	up to 3 up to 25
Maximum running speed		[km/h]	200
Contact wire cross-sections to be clamped*	acc. to EN 50149	AC-80 to 150, Cu-ETP / CuAg0.1 / CuMg0.5 BC-100 to 150, Cu-ETP / CuAg0.1 / CuMg0.5	
	acc. to British Standard 23	Ri161, Cu-ETP	
	acc. to Chinese Standard	CTHA-85 to 150, CuAg0.1 CTMH-110 to 150, CuMg0.5	

* further contact wire cross-sections on request

Materials

Components	Material
Contact wire dead-end clamps, straps, suspension straps, standard parts	stainless steel
Clamping fittings	stainless steel aluminium copper-nickel wrought alloy
Insulating rods	glass-fiber reinforced plastic PTFE
Runners, arcing horns	copper



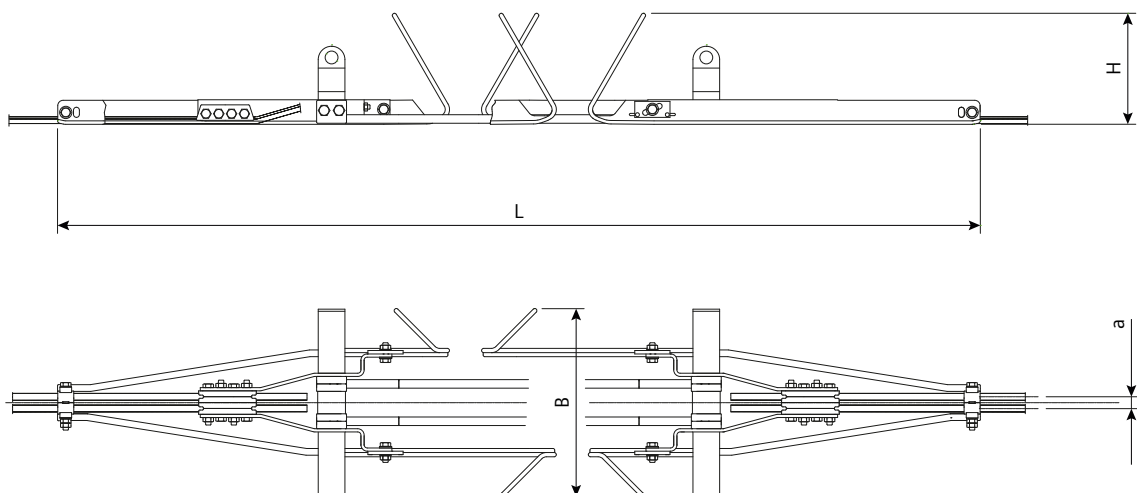
Example of use: Lightweight section insulator 8WL5545-3A with suspension 8WL5545-6A in project Banedanmark, Denmark

Lightweight section insulators for nominal voltage up to 3 kV DC

Type		8WL5545-7A	8WL5545-8A	8WL5545-8AC
Length L	[mm]	approx. 1,725	approx. 1,725	approx. 1,725
Width B	[mm]	340	366	375
Height H	[mm]	208	208	208
Weight	[kg]	13.0	13.8	15.1
Maximum permissible operating load	[kN]	30	30	30
Minimum failing load	[kN]	90	90	90
Creepage distance	[mm]	450	450	450
Clearance in air	[mm]	60	60	60
Number of insulating rods		2	2	2
Number of contact wires		1	2	2
Distance of contact wires a	[mm]	–	28	40

Lightweight section insulators for nominal voltage up to 25 kV AC

Type		8WL5545-2A	8WL5545-3A	8WL5545-4A	8WL5545-4AC	8WL5545-4AD
Length L	[mm]	approx. 2,490	approx. 2,490	approx. 2,490	approx. 2,490	approx. 2,690
Width B	[mm]	472	450	450	539	539
Height H	[mm]	238	238	238	242	242
Weight	[kg]	16.4	14.1	15.9	16.5	17.1
Maximum permissible operating load	[kN]	30	15	30	30	30
Minimum failing load	[kN]	90	45	90	90	90
Creepage distance	[mm]	1,200	1,200	1,200	1,200	1,400
Clearance in air	[mm]	220	220	220	300	300
Number of insulating rods		2	1	2	2	2
Number of contact wires		2	1	1	1	1
Distance of contact wires a	[mm]	28	–	–	–	–



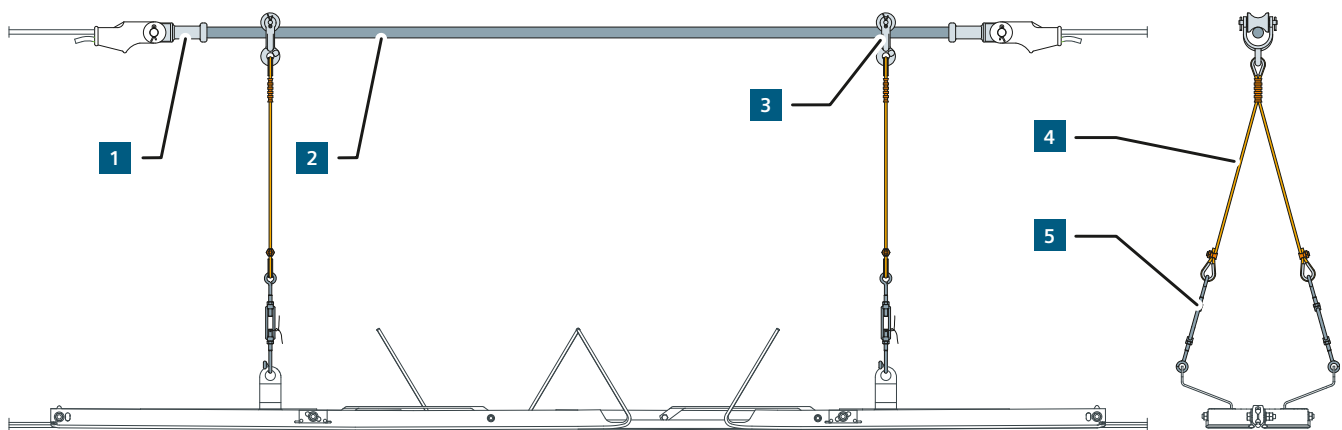
Dimensions at lightweight section insulator

System integration

Suspensions 8WL5545-5A / -6A for catenaries

- Special catenary wire insulator for simultaneous insulation of catenary wire and suspension
- Flexible suspension of the section insulator on the insulating rod compensates length differences between contact wire and catenary wire
- Exact adjusting of height and inclination of lightweight section insulator due to adjustable wire suspension

The suspensions are not supplied with the lightweight section insulator and has to be ordered separately.

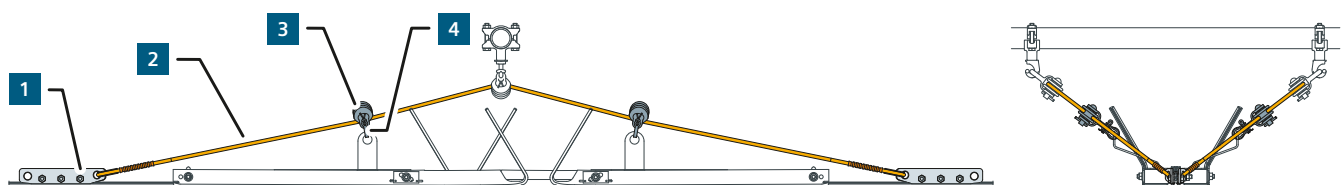


- | | |
|---------------------------------|----------------|
| 1 End fitting of insulating rod | 4 Dropper wire |
| 2 Insulating rod of suspension | 5 Turnbuckle |
| 3 Rod pulley | |

Suspension 8WL5575-8B for trolley-type contact line

- Insulating rope suspension
- Positioning of lightweight section insulators at supports of trolley-type contact line

The suspension is not supplied with the lightweight section insulator and has to be ordered separately.



- | | |
|------------------|---------------|
| 1 Clamp strap | 3 Rope pulley |
| 2 Synthetic wire | 4 Shackle |

Technical data suspensions

Type		8WL5545-5A	8WL5545-6A	8WL5545-6AD	8WL5575-8B
For section insulator 8WL5545-..		-7A / -8A / -8AC	-2A / -3A / -4A / -4AC	-4AD	-7A / -8A / -8AC
Use		Catenary	Catenary	Catenary	Trolley-type contact line
Nominal voltage	[kV]	3 DC / 15 AC	25 AC	25 AC	1,5 DC
Weight	[kg]	6.13	6.63	6.73	3.8
Length	[mm]	1,600	2,000	2,200	2,530

Materials

Components 8WL5545-5A / -6A	Material
End fittings, turnbuckles, thimbles, pins	stainless steel
Insulating rod	glass-fiber reinforced plastic, silicone
Rod pulleys	polyamide, copper-tin alloy
Dropper wire	bronze, strength grade II
Crimped connectors	electrolytic copperr

Components 8WL5575-8B	Material
Straps, thimples, crimped connectors	electrolytic copperr
Synthetic wire	Minoroc wire
Rope pulleys	Polyamide, copper aluminium alloy
Shackles, bolts, nuts	stainless steel
Clamp straps	copper-nickel wrought alloy

Tests and standards

The lightweight section insulators have been subjected to the following tests:

- Mechanical load-time test
- Tensile load test
- Pulse rated voltage test, dry
- Power-frequency flashover voltage test, wet
- Power-frequency withstand voltage test, wet
- Short-circuit test (arcing fault)

according to the following standards:

Mechanical tests:

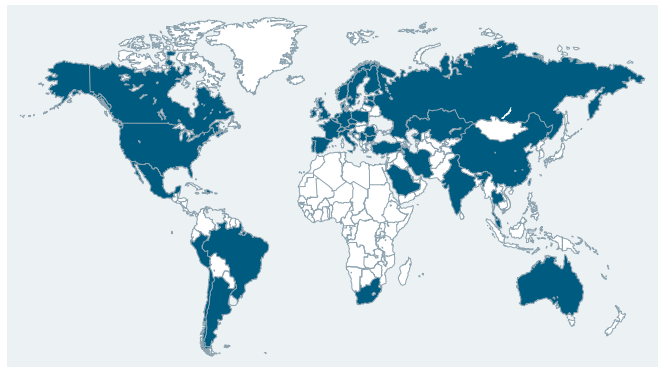
- DIN VDE 0216:1986
- EN 50119:2001

Electrical tests:

- IEC 61109:1992
- IEC 60071-1:1993
- IEC 60383-1:1993
- IEC 60060-1:1989

References

Since the market introduction in 2001 worldwide more than 5,500 Sicat 8WL5545 type lightweight section insulators have been delivered and are proved in field (Status as of September 2017).



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Sicat 8WL5545 / Product information
No. A6Z08110337685 / Version 3.3.0

Siemens Mobility GmbH
Otto-Hahn-Ring 6
81739 Munich
Germany

For further information please contact:

Siemens Mobility GmbH
Turnkey Projects & Electrification
Rail Electrification
Mozartstraße 33b
91052 Erlangen
Germany

electrification.mobility@siemens.com
www.siemens.com/rail-electrification

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