VDE Test Report

DIN EN 61914
Cable cleats for electrical installations

Report No. ..... :	317845-TL6-1
VDE File No. ..... :	5014441-5420-0001/317845
Date of issue ..... :	2024-07-12
Laboratory ..... :	**VDE** Prüf- und Zertifizierungsinstitut GmbH
Address ..... :	Merianstrasse 28 63069 Offenbach/Main; Germany
Testing location/ address ..... :	**VDE** Prüf- und Zertifizierungsinstitut GmbH Merianstrasse 28 63069 Offenbach/Main; Germany
Applicant's name ..... :	icotek GmbH & Co. KG
Applicant's address ..... :	Bischof-von-Lipp-Str. 1; 73569 Eschach; Germany
Applied standard(s) ..... :	DIN EN 61914 (VDE 0604-202):2016-11; EN 61914:2016
Procedure(s) ..... :	---
Test Report Form No. ..... :	VDE_Test_Report_DIN_EN_61914_A
Master TRF ..... :	2021-03-18
Test item description ..... :	Cable cleats
Type reference(s) ..... :	MSMC 10-22; MSMC 20-32

Test sample condition ..... :	☒	Non-damaged sample
	Remark:	
Sample entry date ..... :	2024-03-11	
Date (s) of performance of tests ..... :	2024-06-06 – 2024-07-10	

Tested by (Name, Signature) ..... :	O. Gaedicke (Authorization of test report)	
Function ..... :	Testing engineer	
Approved by (Name, Signature) ..... :	P. Hüfner	
Function ..... :	Technical Certification Officer	

Disclaimer:

This test report contains the result of a singular investigation carried out on the product submitted. A sample of this product was tested to found the accordance with the thereafter listed standards or clauses of standards resp.

The test report does not entitle for the use of a VDE Certification Mark and considers solely the requirements of the specifications mentioned below.

Whenever reference is made to this test report towards third party, this test report shall be made available on the very spot in full length.

Summary of testing in case of partial tests:	
Tests performed (name of test and test clause):	Testing location:
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Possible test case verdicts:				
Test case does not apply to the test object :	N/A			
Test object does meet the requirement..... :	P (Pass)			
Test object does not meet the requirement :	F (Fail)			
Not tested (see general remarks)..... :	N/T			
	☒	Complete tests	☐	Partial tests

Final Verdict:	☒	**P**	☐	**F**
Remark ..... :				

Environmental conditions (if applicable)	Ambient temperature	Atmospheric pressure	Relative humidity
Rated values..... :	15-35 °C	860-1060 hPa	30-60 %
Verified values ..... :	Range confirmed	Range confirmed by: Deutscher Wetterdienst (Meteorological service)	Range confirmed

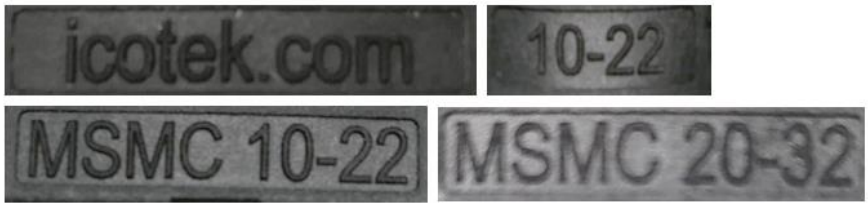
General Remarks:

- This report shall not be reproduced except in full without the written approval of the testing laboratory.
- The test results presented in this report relate only to the item(s) tested.
- ”(see remark #)" refers to a remark appended to the report.
- "(see appended table #)" refers to a table appended to the report.
- Throughout this report a comma is used as the decimal separator.
- Test equipment used is identified in the internal test documents of laboratory.

Conformity statement:

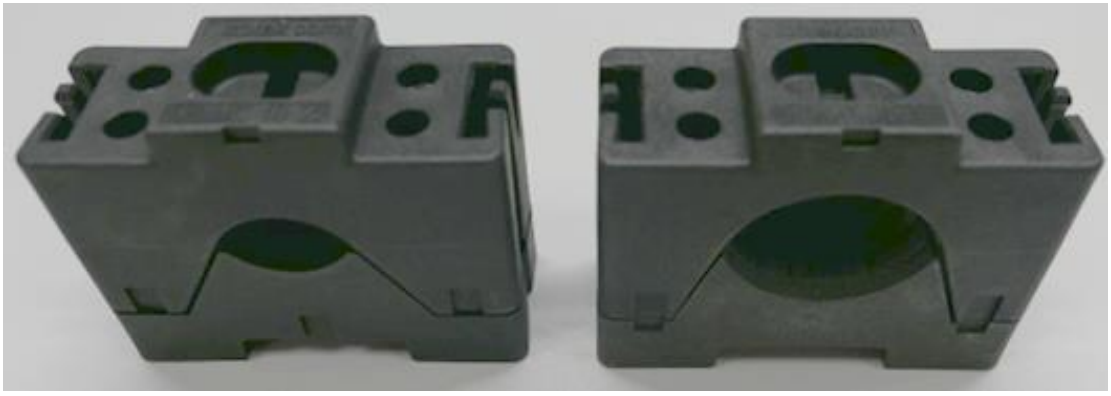
The VDE decision rule for the statement of conformity is in accordance with IEC Guide 115:2023

Copy of marking plate:



Test item particulars: Classification according to clause 6	
According to material:	Composite
Maximum temperature:	+85 °C
Minimum temperature:	-15 °C
Resistance to impact:	2 J
Type of retention:	With lateral retention With axial retention
Resistant to electromechanical forces:	Not declared
Resistant to ultraviolet light:	Not declared
Resistant to corrosion:	High

Foto documentation:



Clause	Prescribed	Observed	Verdict
7	**MARKING AND DOCUMENTATION**		P
7.1	Each cleat and intermediate restraint shall be marked with the manufacturers or responsible vendors name or logo or trademark		P
	The product identification or type name		P
7.2	Marking is durable and clearly legible		P
7.3	The manufacturer or responsible vendor shall provide in their literature:		P
	Classifications according to clause 6		P
	Min. and Max. cable or bundle diameters		P
	Lateral load for cleats		P
	Axial load for cleats		P
	The method of assembly and installation		P
	Peak short-circuit current		N/A
	Initial r.m.s symmetrical short-circuit current		N/A
	Cable outside diameter used in the test in 9.5		N/A
	Max. spacing, D, as shown in Figure 4		N/A
8	**CONSTRUCTION**		P
	The surface shall be free from sharp edges, burrs, flash etc. that are likely damage cables or inflict injury to the installer or user		P
9	**MECHANICAL PROPERTIES**		P
9.1	Cleats and intermediate restraints shall be:		P
	a) Capable of accommodating the declared size or declared range of cable or cable bundle diameter without cracking or breaking, or stripping screw threads		P
	b) Resistant to impact at minimum declared temperature	Test according to 9.2	P
	c) Capable of withstanding the lateral load at the maximum declared temperature	Test according to 9.3	P
	d) Capable of withstanding the axial load at the maximum declared temperature	Test according to 9.4	P
	e) Resistant to electromechanical forces		N/A
9.2	Impact test		P
	Before the test, the samples are assembled onto a solid polyamide or metal mandrel having a diameter equivalent to the max. declared diameter and mounted on a rigid support	See appended table 9.2	P
	For cleats and intermediate restraints taking more than one cable, the appropriate number of mandrels is used		N/A

Clause	Prescribed	Observed	Verdict
	Each sample is placed in position on the steel base as shown in Figure1.		P
	The impact is applied at the weakest point and the direction of impact is radial to the centre of the mandrel		P
	After the test, the samples shall show no signs of desintegration nor shall there be any cracks or damage, visible to normal or corrected vision, that are likely to impair normal use	See appended table 9.2	P
9.3	Lateral load test		P
	The cleat is mounted on a test rig as shown in Figure 2, or a similar arrangement. For the purpose of applying the load, a rigid mandrel is positioned within the cleats aperture. The mandrel size is the minimum for which the cleat is designed	See appended table 9.3	P
	For metallic cable cleats, the declared load is applied gradually and held for a period of (60+5) min		N/A
	For non-metallic and composite cleats, the declared load is applied gradually and held for a period of (60+5) min		P
	Movement of the mandrel shall be less than 50% of the mandrel diameter	See appended table 9.3	P
9.4	Axial load test		P
	The test is carried out using a mandrel with an overall diameter equivalent to the minimum declared cable diameter for which the cleat is designed	See appended table 9.4	P
	In case of non-circular cables, a profile is to be used simulating the outer cable dimension		N/A
	The cleat is mounted on a rigid mounting surface and assembled in the test rig as shown in Figure3, or a similar arrangement		P
	For metallic cable cleats, the declared load is applied gradually and held for a period of (5+1) min		N/A
	For non-metallic and composite cleats, the declared load is applied gradually and held for a period of (5+1)min		P
	After the test, the displacement of the mandrel with respect to the cleat shall not be more than 5 mm	See appended table 9.4	P
9.5	Test for resistance to electromechanical force		N/A
9.5.1	A short-circuit test is carried out using the manufacturers or responsible vendors declared values of peak short-circuit current (ip) and initial r.m.s symmetrical short-circuit current (Ik)		N/A

Clause	Prescribed	Observed	Verdict
	Typical assemblies are showm in Figure 4 using unarmoured single core 600V / 1000V stranded copper conductor cable with outer dimension of (35±5) mm or (50±5) mm		N/A
	Arrangement of the cables is as shown in Figure 5 or Figure 6		N/A
	The test set-up is subjected to a three phase short circuit of duration of not less than 0,1s		N/A
9.5.2	For cable cleats and intermediate restraints classified in 6.4.4		N/A
	They comply with the following requirements:		N/A
	- there shall be no failure that will affect the intended function of holding the cables in place		N/A
	- they shall be intact with no missing parts		N/A
	- there shall be no visible cuts or damage to the outer sheath of the cable		N/A
9.5.3	For cable cleats and intermediate restraints classified in 6.4.5		N/A
	Products classified under 6.4.5 shall comply with 9.5.2		N/A
	After a second short-circuit application a voltage withstand test is performed by applying a minimum test voltage of 2,8 kV d.c. or 1,0 kV a.c. for (60 +5) s according to the provisions of IEC 60060-1:2010, clause 5 or 6		N/A
	The cables shall meet the requirements of the voltage withstand test without failure of the insulation		N/A
10	**FIRE HAZARDS**		P
10.1	Flame propagation		P
	Non-metallic and composite cable cleats and intermediate restraints shall have adequate resistance to flame propagation		P
	Using an arrangement as shown in Figure 7		P
	Needle flame test as specified in IEC 60695-11-5 with following additional information:		P
	- the flame shall be applied to the outer surface of the sample		P
	- the time of application shall be 30s		P
	- the underlying layer shall consist of three layers of tissue		P
	- there shall be a single application of the flame		P
	The sample be deemed to have passed the test if:		P
	- 30 s after the test flame is removed, there is no flaming of the sample		P

Clause	Prescribed	Observed	Verdict
	- there is no ignition of the tissue paper		P
10.2	Smoke emission		P
	The smoke emissions from cleats and intermediate restraints need not be considered because of their small size and quantity in normal use		P
10.3	Smoke toxicity		P
	The smoke toxicity from cleats and intermediate restraints need not be considered because of their small size and quantity in normal use		P
11	**ENVIRONMENTAL INFLUENCES**		N/A
11.1	Resistance to ultraviolet light		N/A
	Cleats and intermediate restraints classified according to 6.5.1.2 shall be subjected to ultraviolet light conditioning according to the following requirements		N/A
	The samples are to be exposed for 700 h to Xenon-arc, Method A, Cycle 1 in accordance with ISO 4892-2:2006.		N/A
	There shall be continuous exposure to light and intermittent exposure to water spray. The cycle shall consist of 102 min without water spray and 18 min with water spray		N/A
	Following the exposure the sample shall be held for a minimum of 30 min under ambient conditions		N/A
	After UV exposure, the samples shall show no signs of desintegration nor shall there be any cracks or damage. The samples shall then be subjected to impact test as described in 9.2		N/A
	Comply with the impact test requirements		N/A
11.2	Resistance to corrosion		P
11.2.1	Metallic or composite cleats and intermediate restraints shall have adequate resistance to corrosion		P
	Products made of non-ferrous metals, cast-iron, malleable-iron or stainless steel containing at least 16% chromium need not be tested and are assumed to meet the high classification		N/A
	Stainless steel containing at least 13% chromium is assumed to meet the low classification and need only be tested where declared in accordance with 6.5.2.2		N/A
	Where corrosion protection is provided by a layer of zinc equal to or greater than that specified in Table 4, measured of the zinc layer is required.		N/A
	Mean zinc layer thickness		N/A

Clause	Prescribed	Observed	Verdict
	Minimum zinc layer thickness		N/A
	The presence of a coating on screws, bolts etc. shall be determined by inspection		P
	Cut edge, a punched hole and the threaded surface of a tapped hole of a part formed from galvanized stock of thickness 2.5 mm or less is not required to be coated		N/A
11.2.2	Salt spray test		N/A
	The samples shall be assembled onto a polyamide 66 mandrel with a diameter equal to the smallest cable diameter		N/A
	Salt spray test according to ISO 9227 for the duration specified in table 4		N/A
	After the parts have been dried for a minimum of 10 min in a heating cabinet at a temperature of (100 ±5) °C any traces of rust on sharp edges and a yellowish film may removed by rubbing		N/A
	The samples shall have passed the test if there is no visible red rust		N/A
12	**ELECTROMAGNETIC COMPATIBILITY**		P
12.1	Electromagnetic emission		P
	Products covered by this standards are, in normal use, passive in respect of electromagnetic emission		P
12.2	Inductive heating		N/A
	The manufacturer or responsible vendor of cleats made from ferromagnetic materials that may complete an electrical and magnetic circuit around the cable, shall issue a warning that the cleats shall not be used on single core cables in a.c. circuits		N/A

9.2	TABLE: Impact test		
	Test temperature (°C) ..... :	-15 °C	—
	Impact energy (J) ..... :	2 J	—
	Mass (kg) ..... :	0,5 kg	—
	Height (mm) ..... :	400 mm	—
	Material of test mandrel ..... :	Steel	—

Specimen	Diameter of the test mandrel (mm)	No signs of disintegration No visible cracks or damage (P/F)	Verdict
MSMC 10-22	22 mm	P	P
MSMC 20-32	32 mm	P	P

Supplementary information:

9.3	TABLE: Lateral load test			
	Test temperature (°C) ..... :	+85 °C		—
	Material of test mandrel ..... :	Steel		—

Specimen	Diameter of the test mandrel (mm)	Lateral load at the maximum declared temperature (N)	Maximum allowed movement of the mandrel (mm)	Verdict
MSMC 10-22	10 mm	1000	5 mm	P
MSMC 20-32	20 mm	1000	10 mm	P

Supplementary information:

9.4	TABLE: Axial load test			
	Test temperature (°C) ..... :	+85 °C		—
	Material of test mandrel ..... :	Steel		—

Specimen	Diameter of the test mandrel (mm)	Axial load at the maximum declared temperature (N)	Maximum allowed movement of the mandrel (mm)	Verdict
MSMC 10-22	10 mm	110	5 mm	P
MSMC 20-32	20 mm	190	5 mm	P

Supplementary information:

Measurement devices	
General	
Measuring tape	No. 204 0722
Steel ruler	No. 204 0494
Digital calliper	No. 204 0691
Stop-watch	No. 160 0224
Mechanical properties	
Balance	No. 230 0418
Digital torque meter	No. 521 0330
Impact test	
Climatic chamber	No. 516 0330
Test device	No. 521 0279
Load tests	
Climatic chamber	No. 516 0306
Temperature logger	No. 130 2270
Test device	No. 521 0502
Load cell	No. 521 0504
Fire hazard	
Needle flame test device	No. 522 0270

End of Test Report