Testing of lightning protection systems

according to DIN EN 62305-3 (VDE 0185-305-3) in explosion hazardous areas

Test report No.:	
Date:	

1. General information:			
Location of the building to be tested:			
Name:			
Contact:			
Address:			
Telephone:			
Proprietor of the building to be tested ☐ / customer ☐ :			
Name:			
Contact:			
Address:			
Telephone:		E-Mail:	
Person in charge:		Phone:	
Address of the tester:			
Name:			
Contact:			
Address:			
Telephone:		E-Mail:	
Valid work permit ☐			
Address of the lightning protection system designer:			
Name:			
Contact:			
Address:			
Telephone:		E-Mail:	

2. Details on the building:	
Name of the building/complex:	
Location:	
Use:	
Built in (year):	
Extension (year):	
Building height:	
Building dimensions (circumference):	
Type of construction:	
Roof shape:	
Type of roofing:	

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3. Prerequisites of testing:

Description and drawing of the lightning protection system:	

Lightning protection standards and regulations in effect at the time the building is constructed:

☐ DIN EN 62305-3 (2011-10)	☐ DIN V VDE V 0185-3 (2002-11)	☐ DIN VDE 0185-1 (1982-11)
☐ VDE 0185-305-3 (2006-10)	☐ DIN V VDE V 0185-4 (2002-11)	☐ DIN VDE 0185-2 (1982-11)
☐ VDE 0185-305-3: supplementary sheets 1-5	☐ TGL _____	
☐ VDE 0185-305-4 (2011-10)		
Class of ☐ I ☐ II ☐ III ☐ IV	Determination acc. to:	
Explosion protection document ☐	As of:	
Plan of Ex zones/Drawing No.		

4. Test object:

☐ External LPS	☐ Internal LPS	☐ Complete documentation
☐ Existing documents (implementation and acceptance protocols)		

5. Type of testing:

☐ Technical inspection acc. to German TRBS Part 1 (Technical Regulations for Operational Safety)		
☐ Inspection of planning documents	☐ before implementation	☐ periodic
☐ Test during construction	☐ after modification	

6. Details upon lightning protection system:

6.1 Air-termination systems:

Drawing No.:				
Mesh size:	☐ ≤ 5 m x 5 m	☐ ≤ 10 m x 10 m	☐ ≤ 15 m x 15 m	☐ ≤ 20 m x 20 m
	☐ ≤ 10 m x 20 m	☐ ≤ ____ m x ____ m		
Protective angle:				
Air-termination system:				
Material:	☐ Aluminium	☐ Copper	☐ StSt (V2A)	☐
Roof superstructures (dimensions):				
Other:				

6.2 Down-conductor systems:

Down-conductor (description)				
Material:	☐ Aluminium	☐ Copper	☐ StSt (V2A)	☐
Cross-section (mm):				
Quantity/Test joint/No.:	Quantity:	Test joint:		No.:
Number of down-conductors:				
Other:				

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6.3 Earth-termination system:				
Material:	☐ Steel, hot-dip galvanised	☐ StSt (V4A)	☐ Copper	☐
Type/Design:	Type A: ☐ Horizontal earthing electrode		☐ Vertical earthing electrode	
	Type B: ☐ Foundation earthing electrode according to DIN 18014		☐ Surface earthing electrode	
Other:				

6.4 Separation distance:		
Separation distance calculated:	☐ Yes ☐ No	
Separation distance kept:	☐ Yes ☐ No	
Calculating the separation distance of:		Date:

6.5 Lightning equipotential bonding structure connected to metal installations:			
Piping:	☐ Yes ☐ No	☐ connected, location of connection:	
		Ex-Zone:	
		Non-ignition-sparking connection technology observed:	☐ Yes ☐ No
		Terminal cross section ≥ 16 mm² Cu:	☐ Yes ☐ No
		☐ Connection with Ex FS	
Any scaffolding:	☐ Yes ☐ No	Connection correct	☐ Yes ☐ No
Any framework:	☐ Yes ☐ No	Connection correct	☐ Yes ☐ No
Any cable racks:	☐ Yes ☐ No	Connection correct	☐ Yes ☐ No

6.6 Lightning equipotential bonding structure connected to metal installations:					
Type of system:	☐ TT	☐ TN-C	☐ TN-S	☐ TN-C-S	☐ IT
Lightning current arrester SPD Type 1:	exists:		☐ Yes ☐ No		
	Manufacturer:			Product name:	
	Place of installation:				
	Proper function:		☐ Yes ☐ No		
Other:					

6.7 Lightning equipotential bonding structure connected to IT installations:			
Data communication and telecommunication:			
Measuring and control technology:			
Coaxial conductors:			
Lightning current arrester SPD Type 1 (D1 category)	exists:	☐ Yes ☐ No	
	Manufacturer:		Product name:
	Place of installation:		
	Proper function:	☐ Yes ☐ No	
Special terms of use observed [e.g. Ex(i)]		☐ Yes ☐ No	
Other:			

7. Testing of technical documentation:		
	ok	
☐ Complete and in line with the lightning protection standard	☐ Yes ☐ No	
☐ Complete and in line with the Ex standards and regulations?	☐ Yes ☐ No	

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8. Testing on site:

	ok	
Condition of the external LPS:		
8.1 ☐ Installation of all conductors and system components	☐ Yes ☐ No	
8.2 ☐ Installation and condition of the air-termination system	☐ Yes ☐ No	
8.3 ☐ Installation and condition of the down-conductors	☐ Yes ☐ No	
8.4 ☐ Earth-termination system		
– All earth connections	☐ Yes ☐ No	
– Components affected by corrosion	☐ Yes ☐ No	
8.5 ☐	☐ Yes ☐ No	
8.6 ☐	☐ Yes ☐ No	
Condition of the internal LPS:		
8.7 ☐ Correct installation of all lightning current (SPD Type 1) and surge arresters (SPD Type 2)		
– Power supply system	☐ Yes ☐ No	
– Information technology system	☐ Yes ☐ No	
8.8 ☐ Damage or activation of the lightning current arrester	☐ Yes ☐ No	
8.9 ☐ Interruption of SPD back-up fuses	☐ Yes ☐ No	
8.10 ☐ Ignition type of protection arrester or installation housing observed	☐ Yes ☐ No	
8.11 ☐ Continuous lightning equipotential bonding for new supply connections inside the building which have been installed since the last inspection	☐ Yes ☐ No	
8.12 ☐ Equipotential bonding connections inside the building	☐ Yes ☐ No	
Separation distance:		
8.13 ☐ Separation distance between LPS and installations	☐ Yes ☐ No	
Complements:		
8.14 ☐ Changes which require additional protection measures	☐ Yes ☐ No	
8.15 ☐	☐ Yes ☐ No	
8.16 ☐	☐ Yes ☐ No	
8.17 ☐	☐ Yes ☐ No	
8.18 ☐ Non-ignition-sparking ensured	☐ Yes ☐ No	

9. Measuring details:

Measuring method:	
Measuring devices:	
Inventory no.	
Weather conditions:	

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10. Measuring:

Electrical conductivity of connections which are not visibly installed (test current recommended ≥ 200 mA)

Recommended value < 1 ohm)

10.1	☐ Air-termination systems	☐ Yes ☐ No	
10.2	☐ Down-conductors	☐ Yes ☐ No	
10.3	☐ Earth conductors	☐ Yes ☐ No	
10.4	☐ Equipotential bonding conductors	☐ Yes ☐ No	
10.5	☐	☐ Yes ☐ No	
10.6	☐	☐ Yes ☐ No	

10.7 Electrical conductivity of metal installations:

Piping:	Scaffolding:	Framework:	Cable racks:
Ω	Ω	Ω	Ω

10.8 Measuring the transition resistances R at all measuring points in order to determine the electrical conductivity of the earth conductors:

Test joint No.:	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Value in ohm:									
Test joint No.:	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Value in ohm:									
Test joint No.:	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Value in ohm:									

10.9 Measuring the transition resistances R at all measuring points in order to determine the electrical conductivity of conductivity of down conductors and air-termination systems:

Test joint No.:	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Value in ohm:									
Test joint No.:	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Value in ohm:									
Test joint No.:	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Value in ohm:									

10.10 Measuring the earthing electrode resistance R_A of individual earthing electrodes when test joint is open:

Test joint No.:	1	2	3	4	5	6	7	8	9
Value in ohm:									
Test joint No.:	10	11	12	13	14	15	16	17	18
Value in ohm:									
Test joint No.:	19	20	21	22	23	24	25	26	27
Value in ohm:									

Soil composition:	☐ sandy soil	☐ gravel	☐ boggy soil, marshy ground, humus soil
	☐ stony	☐ concrete	☐ loamy soil, clay soil, farmland
Soil state:	☐ dry	☐ humid	☐ frozen

10.11 Measuring the earthing electrode resistance of the entire system when test joints are closed _____ Ω	
Visual inspection of the uncovered earthing electrode	☐ Yes ☐ No
Location of the uncovered earthing electrode:	
Condition of earth-termination system	☐ Yes ☐ No

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11. Total earthing resistance of the system:

Type of measurement:	☐ without protective equipotential bonding conductor	Ω
	☐ with protective equipotential bonding conductor	Ω

12. Test report:

The LPS has no defects: ☐ Yes ☐ No

	see No.	Notes
The test revealed the following defects:		

Recommendation:	

13. Time limits for required inspections:

According to German Health and Safety at Work Regulations BetrSichV § 3 (3), it is up to the employer (entrepreneur) to specify time limits for inspections. Based on relevant and objective arguments the inspector has to make suggestions for the time limit until next inspection.

13.1 Visual inspections:

Note:
For a permanently effective lightning protection, the external lightning protection measures should be inspected at least every 6 months. So any changes, extensions or mechanical effects that might impair its protective effect can be detected early and can be removed as soon as possible.

Necessity of visual inspections was pointed out to the operator: ☐ Yes ☐ No

13.2 Complete inspection of the internal and external lightning protection measures:

Inspector suggests following date for the next complete inspection of internal and external lightning protection:

Note 1: According to the German Hazardous Substances Ordinance (article 7 (7)) and the German Ordinance on Industrial Safety and Health (section 3 (5.2)) a maximum time limit of 3 years must not be exceeded.

Note 2: Suggestions for periodical inspections are made in the information annex E of DIN EN 62305-3 (VDE 0185-305-3), section E.7 and in Table E.2

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Number of pages test report:		
Number of pages drawings:		
Number of photos for the test report:		
Number of pages in total assets:		
Enclosures of the test report / Drawing No.		

Notes for the proprietor of the system:
☐ The proprietor has to remedy the defects.
☐ Check if additional internal lightning protection measures are necessary
☐ In case of structural alteration or lightning strike, immediately contact the revision service.
☐

Company

Place

Date

Signature of the tester

Company

Place

Date

Signature of the person in charge