

PD CLC/TR 60079-32-1:2015



BSI Standards Publication

# Explosive atmospheres

Part 32-1: Electrostatic hazards, guidance

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**National foreword**

This Published Document is the UK implementation of CLC/TR 60079-32-1:2015. It is identical to IEC/TS 60079-32-1:2013. It supersedes PD CLC/TR 50404:2003 and PD IEC/TS 60079-32-1:2013, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EXL/31, Equipment for explosive atmospheres.

A list of organizations represented on this committee can be obtained on request to its secretary.

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## Foreword

This document (CLC/TR 60079-32-1:2015) consists of the text of IEC/TS 60079-32-1:2013 prepared by IEC/TC 31 "Equipment for explosive atmospheres".

This document supersedes CLC/TR 50404:2003

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## Endorsement notice

The text of the International Standard IEC/TS 60079-32-1:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60243-1	NOTE	Harmonized as EN 60243-1.
IEC 60243-2	NOTE	Harmonized as EN 60243-2.
IEC 60247	NOTE	Harmonized as EN 60247.
IEC 61340-2-1	NOTE	Harmonized as EN 61340-2-1.
IEC 61340-4-5	NOTE	Harmonized as EN 61340-4-5.
IEC 61340-4-7	NOTE	Harmonized as EN 61340-4-7.
ISO 8028	NOTE	Harmonized as EN ISO 8028.
ISO 8330	NOTE	Harmonized as EN ISO 8330.
ISO 13688	NOTE	Harmonized as EN ISO 13688.
ISO 20344	NOTE	Harmonized as EN ISO 20344.
ISO 20345	NOTE	Harmonized as EN ISO 20345.

**Annex ZA**  
(normative)

**Normative references to international publications  
with their corresponding European publications**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60079-0	-	Explosive atmospheres -- Part 0: Equipment - General requirements	EN 60079-0	-
-	-		+A11	-
IEC 60079-10-1	-	Explosive atmospheres -- Part 10-1: Classification of areas - Explosive gas atmospheres	EN 60079-10-1	-
IEC 60079-10-2	-	Explosive atmospheres -- Part 10-2: Classification of areas - Combustible dust atmospheres	EN 60079-10-2	-
IEC 60079-14	-	Explosive atmospheres -- Part 14: Electrical installations design, selection and erection	EN 60079-14	-
IEC 60079-20-1	-	Explosive atmospheres - Part 20-1: Material characteristics for gas and vapour classification - Test methods and data	EN 60079-20-1	-
IEC 60079-32-2	-	Explosive atmospheres -- Part 32-1: Electrostatic hazards - Tests	-	-
IEC 60093	-	Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials	HD 429 S1	-
IEC 60167	-	Methods of test for the determination of the insulation resistance of solid insulating materials	HD 568 S1	-
IEC 61340-2-3	-	Electrostatics -- Part 2-3: Methods of test for determining the resistance and resistivity of solid planar materials used to avoid electrostatic charge accumulation	EN 61340-2-3	-
IEC 61340-4-1	-	Electrostatics -- Part 4-1: Standard test methods for specific applications - Electrical resistance of floor coverings and installed floors	EN 61340-4-1	-
IEC 61340-4-3	-	Electrostatics -- Part 4-3: Standard test methods for specific applications - Footwear	EN 61340-4-3	-
IEC 61340-4-4	2012	Electrostatics - Part 4-4: Standard test methods for specific applications - Electrostatic classification of flexible intermediate bulk containers (FIBC)	EN 61340-4-4	2012
ISO 284	-	Conveyor belts - Electrical conductivity - Specification and test method	EN ISO 284	-

ISO 6297	-	Petroleum products - Aviation and distillate fuels - Determination of electrical conductivity	-
ISO 8031	-	Rubber and plastics hoses and hose assemblies - Determination of electrical resistance and conductivity	EN ISO 8031 -
ISO 9563	-	Belt drives; electrical conductivity of antistatic endless synchronous belts; characteristics and test method	- -
ISO 12100-1	-	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology	EN ISO 12100-1 -
ISO 16392	-	Tyres - Electrical resistance - Test method for measuring electrical resistance of tyres on a test rig	- -
ISO 21178	-	Light conveyor belts - Determination of electrical resistances	EN ISO 21178 -
ISO 21179	-	Light conveyor belts - Determination of the electrostatic field generated by a running light conveyor belt	EN ISO 21179 -
ISO 21183-1	-	Light conveyor belts - Part 1: Principal characteristics and applications	EN ISO 21183-1 -
ASTM D257	-	Standard Test Methods for DC Resistance or Conductance of Insulating Materials	- -
ASTM D2624-07a	-	Standard Test Methods for Electrical Conductivity of Aviation and Distillate Fuels	- -
ASTM D4308-95	-	Standard Test Method for Electrical Conductivity of Liquid Hydrocarbons by Precision Meter	- -
ASTM E2019-03	-	Standard test method for minimum ignition energy of a dust cloud in air	- -
ASTM E582-88	-	Standard test method for minimum ignition energy and quenching distance in gaseous mixtures	- -
ASTM F150	-	Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring	- -
ASTM F1971	-	Standard Test Method for Electrical Resistance of Tires Under Load On the Test Bench	- -
BS 5958-1	-	Code of practice for control of undesirable static electricity - Part 1: General considerations	- -
BS 5958-2	-	Code of practice for control of undesirable static electricity - Part 2: Recommendations for particular industrial situations	- -
BS 7506-2	-	Methods for measurements in electrostatics - Part 2 Test methods	- -
DIN 51412-1	-	Testing of petroleum products; determination of the electrical conductivity - Part 1: laboratory method	- -
DIN 51412-2	-	Testing of petroleum products; determination of the electrical conductivity - Part 2: field method	- -
EN 1081	-	Resilient floor coverings - Determination of the electrical resistance	- -
EN 1149-3	-	Protective clothing - Electrostatic properties - Part 3: Test methods for measurement of charge decay	- -

EN 1149-5	-	Protective clothing - Electrostatic properties - Part 5: Material performance and design requirements	-	-
EN 13463-1	-	Non-electrical equipment for use in potentially explosive atmospheres - Part 1: Basic method and requirements	-	-
EN 1360	-	Rubber and plastic hoses and hose assemblies for measured fuel dispensing systems - Specification	-	-
EN 1361	-	Rubber hoses and hose assemblies for aviation fuel handling - Specification	-	-
EN 14125	-	Thermoplastic and flexible metal pipework for underground installation at petrol filling stations	-	-
EN 14973	-	Conveyor belts for use in underground installations - Electrical and flammability safety requirements	-	-
ISGOTT	-	International Safety Guide for Oil Tankers and Terminals (ISGOTT), fifth edition, International chamber of shipping, 2006	-	-
JNIOOSH TR 42	-	Recommendations for Requirements for Avoiding Electrostatic Hazards in Industry	-	-
NFPA 77	-	Recommended practice on static electricity -	-	-
SAE J1645	-	Surface vehicle recommended practice - Fuel systems and Components - Electrostatic Charge Mitigation	-	-

## CONTENTS

FOREWORD .....	14
INTRODUCTION .....	16
1 Scope .....	17
2 Normative references .....	17
3 Terms and definitions .....	20
4 Nomenclature .....	23
5 General .....	24
6 Static electricity in solid materials .....	25
6.1 General considerations .....	25
6.2 The use of conductive or dissipative materials in place of insulating ones .....	27
6.2.1 General considerations .....	27
6.2.2 Dissipative solid materials .....	27
6.2.3 Earthing of conductive and dissipative items .....	28
6.3 Precautions required when using insulating solid materials .....	29
6.3.1 General .....	29
6.3.2 Restrictions on the size of chargeable insulating surfaces .....	30
6.3.3 Earthed metal meshes .....	31
6.3.4 Insulating coatings on earthed conductive surfaces .....	31
6.3.5 Conductive or dissipative coatings on insulating materials .....	32
6.3.6 Static dissipative agents .....	33
6.3.7 Humidification .....	33
6.3.8 Ionisation / Charge Neutralisation .....	33
6.3.9 Methods to determine the incendiarity of discharges .....	34
6.4 Conveyor belts and transmission belts .....	35
6.4.1 General .....	35
6.4.2 Conveyor belts .....	35
6.4.3 Transmission belts .....	36
7 Static electricity in liquids .....	37
7.1 General considerations .....	37
7.1.1 Occurrence of flammable atmospheres .....	37
7.1.2 Ignition sensitivity and limitations to the scope of advice .....	38
7.1.3 Charging mechanisms .....	39
7.1.4 Charge accumulation and conductivity classifications .....	39
7.1.5 Incendive discharges produced during liquid handling operations .....	40
7.2 Summary of precautions against ignition hazards during liquid handling operations .....	41
7.2.1 Earthing and avoidance of isolated conductors .....	41
7.2.2 Restricting charge generation .....	41
7.2.3 Avoidance of a flammable atmosphere .....	42
7.2.4 Promoting charge dissipation .....	42
7.3 Tanks and Containers .....	42
7.3.1 General .....	42
7.3.2 Conductive tanks and containers .....	43
7.3.3 Tanks and containers made entirely of dissipative material .....	56

7.3.4	Tanks and containers with insulating surfaces .....	56
7.3.5	Use of liners in containers .....	60
7.4	High viscosity liquids.....	61
7.5	High charging equipment .....	61
7.5.1	Filters, water separators and strainers .....	61
7.5.2	Pumps and other equipment .....	62
7.6	Gauging and sampling in tanks .....	63
7.6.1	General .....	63
7.6.2	Precautions during gauging and sampling.....	63
7.7	Pipes and hose assemblies for liquids.....	64
7.7.1	General .....	64
7.7.2	Pipes .....	64
7.7.3	Hoses and hose assemblies .....	67
7.8	Special filling procedures .....	73
7.8.1	Aircraft fuelling .....	73
7.8.2	Road tanker deliveries .....	74
7.8.3	Retail filling stations .....	75
7.8.4	Mobile or temporary liquid handling equipment.....	79
7.9	Plant processes (blending, stirring, mixing, crystallisation and stirred reactors) .....	79
7.9.1	General .....	79
7.9.2	Earthing.....	79
7.9.3	In-line blending.....	79
7.9.4	Blending in vessels or tanks .....	80
7.9.5	Jet mixing .....	80
7.9.6	High speed mixing .....	81
7.10	Spraying liquids and tank cleaning .....	81
7.10.1	General .....	81
7.10.2	Tank cleaning with low or medium pressure water jets (up to about 12 bar).....	81
7.10.3	Tank cleaning with low conductivity liquids .....	82
7.10.4	Tank cleaning with high pressure water or solvent jets (above 12 bar).....	82
7.10.5	Steam cleaning tanks .....	82
7.10.6	Water deluge systems .....	83
7.11	Glass systems .....	83
7.11.1	General .....	83
7.11.2	Precautions to be taken for low conductivity liquids .....	83
8	Static electricity in gases .....	84
8.1	General.....	84
8.2	Grit blasting .....	84
8.3	Fire extinguishers .....	85
8.4	Inerting .....	85
8.5	Steam cleaning .....	85
8.6	Accidental leakage of compressed gas .....	85
8.7	Spraying of flammable paints and powders .....	86
8.7.1	General .....	86
8.7.2	Earthing.....	86
8.7.3	Plastic spray cabinets .....	86

8.8	Vacuum cleaners, fixed and mobile .....	86
8.8.1	General .....	86
8.8.2	Fixed systems.....	86
8.8.3	Portable systems .....	87
8.8.4	Vacuum trucks.....	87
9	Static electricity in powders .....	87
9.1	General.....	87
9.2	Discharges, occurrence and incendivity .....	88
9.3	Procedural measures .....	89
9.3.1	General .....	89
9.3.2	Humidification.....	89
9.3.3	Hoses for pneumatic transfer .....	89
9.3.4	Ionisation.....	89
9.4	Bulk materials in the absence of flammable gases and vapours .....	90
9.4.1	General .....	90
9.4.2	Equipment and objects made of conductive or dissipative materials.....	90
9.4.3	Equipment and objects made of insulating materials .....	90
9.4.4	Dust separators .....	91
9.4.5	Silos and Containers.....	91
9.5	Additional requirements for bulk material in the presence of flammable gases and vapours.....	97
9.5.1	General .....	97
9.5.2	Measures for resistivity greater equal 100 MΩ m .....	97
9.5.3	Measures for resistivity less than 100 MΩ m .....	97
9.5.4	Filling of bulk material into a container.....	98
9.6	Flexible intermediate bulk containers (FIBC).....	99
9.6.1	General .....	99
9.6.2	Additional precautions when using FIBC .....	101
10	Static electricity when handling explosives and electro-explosive devices.....	102
10.1	Explosives manufacture, handling and storage.....	102
10.1.1	General .....	102
10.1.2	First degree protection.....	102
10.1.3	Intermediate protection .....	102
10.1.4	Second degree protection .....	102
10.2	Handling of electro-explosive devices .....	103
10.2.1	General .....	103
10.2.2	Earthing.....	103
10.2.3	Precautions during storage and issue .....	104
10.2.4	Precautions during preparation for use .....	104
11	Static electricity on people.....	104
11.1	General considerations .....	104
11.2	Static dissipative floors .....	105
11.3	Dissipative and conductive footwear .....	105
11.4	Supplementary devices for earthing of people .....	106
11.5	Clothing .....	106
11.6	Gloves .....	106
11.7	Other Items.....	106
12	Electrostatic shock .....	106

12.1	Introduction.....	108
12.2	Discharges relevant to electrostatic shocks.....	109
12.3	Sources of electrostatic shock.....	109
12.4	Precautions to avoid electrostatic shocks.....	110
12.4.1	Sources of electrostatic shocks.....	110
12.4.2	Reported shocks from equipment or processes.....	110
12.4.3	Shocks as a result of people being charged.....	110
12.5	Precautions in special cases.....	111
12.5.1	Pneumatic conveying.....	111
12.5.2	Vacuum cleaners.....	111
12.5.3	Reels of charged film or sheet.....	111
12.5.4	Fire extinguishers.....	112
13	Earthing and bonding.....	112
13.1	General.....	112
13.2	Criteria for the dissipation of static electricity from a conductor.....	113
13.2.1	Basic considerations.....	113
13.2.2	Practical criteria.....	113
13.3	Earthing requirements in practical systems.....	115
13.3.1	All-metal systems.....	115
13.3.2	Metal plant with insulating parts.....	116
13.3.3	Insulating materials.....	117
13.3.4	Conductive and dissipative materials.....	118
13.3.5	Earthing via intrinsic safety circuits.....	118
13.3.6	Earthing of ships.....	118
13.4	The establishment and monitoring of earthing systems.....	118
13.4.1	Design.....	118
13.4.2	Monitoring.....	119
Annex A (informative)	Fundamentals of static electricity.....	120
A.1	Electrostatic charging.....	120
A.1.1	Introduction.....	120
A.1.2	Contact charging.....	120
A.1.3	Contact charging of liquids.....	120
A.1.4	Charge generation on liquids flowing in pipes.....	121
A.1.5	Charge generation in filters.....	124
A.1.6	Charge generation during stirring and mixing of liquids.....	124
A.1.7	Settling potentials.....	124
A.1.8	Breakup of liquid jets.....	124
A.1.9	Contact charging of powders.....	124
A.1.10	Charging by induction.....	125
A.1.11	Charge transfer by conduction.....	125
A.1.12	Charging by corona discharge.....	125
A.2	Accumulation of electrostatic charge.....	125
A.2.1	General.....	125
A.2.2	Charge accumulation on liquids.....	126
A.2.3	Charge accumulation on powders.....	127
A.3	Electrostatic discharges.....	128
A.3.1	Introduction.....	128
A.3.2	Sparks.....	128
A.3.3	Corona.....	129

A.3.4	Brush discharges .....	129
A.3.5	Propagating brush discharges.....	130
A.3.6	Lightning like discharges .....	130
A.3.7	Cone discharges.....	131
A.4	Measurements for risk assessment .....	131
Annex B (informative)	Electrostatic discharges in specific situations .....	133
B.1	Incendive discharges involving insulating solid materials .....	133
B.1.1	General .....	133
B.1.2	Sparks from isolated conductors .....	133
B.1.3	Brush discharges from insulating solid materials.....	133
B.1.4	Propagating brush discharges from insulating solid materials .....	133
B.2	Incendive discharges produced during liquid handling.....	134
B.2.1	General .....	134
B.2.2	Calculated maximum safe flow velocities for filling medium- sized vertical axis storage tanks .....	134
B.3	Incendive discharges produced during powder handling and storage .....	136
B.3.1	General .....	136
B.3.2	Discharges from bulk powder.....	136
B.3.3	Discharges from powder clouds .....	136
B.3.4	Discharges involving insulating containers and people.....	136
B.3.5	The use of liners in powder processes .....	136
B.3.6	Spark discharges in powder processes .....	137
B.3.7	Brush discharges in powder processes .....	137
B.3.8	Corona discharges in powder processes.....	137
B.3.9	Propagating brush discharges in powder processes.....	137
Annex C (informative)	Flammability properties of substances.....	139
C.1	General.....	139
C.2	Effect of oxygen concentration and ambient conditions .....	139
C.3	Explosive limits for gases and liquids .....	139
C.4	Inerting .....	139
C.5	Flash point.....	140
C.6	Minimum ignition energies.....	140
C.7	Combustible powders.....	143
C.8	Biofuels.....	143
Annex D (informative)	Classification of hazardous areas.....	144
D.1	Concept of zoning .....	144
D.2	Classification .....	144
D.3	Explosion groups .....	144
D.3.1	General .....	144
D.3.2	Group I .....	144
D.3.3	Group II .....	145
D.3.4	Group III .....	145
Annex E (informative)	Classification of equipment protection level .....	146
Annex F (informative)	Flow chart for a systematic electrostatic evaluation .....	147
Annex G (informative)	Tests .....	149
G.1	General.....	149
G.2	Surface resistance .....	149
G.2.1	General .....	149

	G.2.2	Principle .....	149
	G.2.3	Apparatus .....	149
	G.2.4	Test sample .....	150
	G.2.5	Procedure .....	151
	G.2.6	Acceptance criteria .....	151
	G.2.7	Test report .....	151
G.3		Surface resistivity .....	151
G.4		Leakage resistance .....	152
	G.4.1	General .....	152
	G.4.2	Principle .....	152
	G.4.3	Apparatus .....	152
	G.4.4	Test sample .....	152
	G.4.5	Procedure .....	153
	G.4.6	Acceptance criteria .....	153
	G.4.7	Test report .....	153
G.5		In-use testing of footwear .....	153
	G.5.1	General .....	153
	G.5.2	Principle .....	153
	G.5.3	Apparatus .....	153
	G.5.4	Procedure .....	154
	G.5.5	Acceptance criteria .....	154
	G.5.6	Test report .....	154
G.6		In-use testing of gloves .....	154
	G.6.1	General .....	154
	G.6.2	Principle .....	154
	G.6.3	Apparatus .....	155
	G.6.4	Procedure .....	155
	G.6.5	Acceptance criteria .....	155
	G.6.6	Test report .....	155
G.7		Powder resistivity .....	155
	G.7.1	General .....	155
	G.7.2	Principle .....	155
	G.7.3	Apparatus .....	156
	G.7.4	Procedure .....	156
	G.7.5	Acceptance criteria .....	157
	G.7.6	Test report .....	157
G.8		Liquid conductivity .....	157
	G.8.1	General .....	157
	G.8.2	Principle .....	157
	G.8.3	Apparatus .....	157
	G.8.4	Procedure .....	158
	G.8.5	Acceptance criteria .....	158
	G.8.6	Test report .....	158
G.9		Capacitance .....	159
	G.9.1	General .....	159
	G.9.2	Principle .....	159
	G.9.3	Apparatus .....	159
	G.9.4	Test sample .....	159
	G.9.5	Procedure for moveable items .....	159

G.9.6	Procedure for installed items .....	160
G.9.7	Acceptance criteria .....	160
G.9.8	Test report.....	160
G.10	Transferred charge .....	161
G.10.1	General .....	161
G.10.2	Principle .....	161
G.10.3	Apparatus .....	161
G.10.4	Test sample.....	162
G.10.5	Procedure.....	162
G.10.6	Acceptance criteria .....	163
G.10.7	Test report.....	163
G.11	Ignition test.....	164
G.11.1	General .....	164
G.11.2	Apparatus .....	164
G.11.3	Procedure.....	167
G.11.4	Acceptance criteria .....	167
G.11.5	Test report.....	167
G.12	Measuring of charge decay .....	168
G.12.1	General .....	168
G.12.2	Principle .....	168
G.12.3	Apparatus .....	168
G.12.4	Test sample.....	169
G.12.5	Procedure.....	169
G.12.6	Acceptance criteria .....	170
G.12.7	Test report.....	170
G.13	Breakthrough voltage .....	170
G.13.1	General .....	170
G.13.2	Principle .....	170
G.13.3	Apparatus .....	170
G.13.4	Test procedure .....	171
G.13.5	Acceptance criteria .....	171
G.13.6	Test report.....	171
Bibliography.....		173
Figure 1 – Flow diagram: Assessment of bulk material with $\rho \leq 1 \text{ M}\Omega \text{ m}$ .....		93
Figure 2 – Flow diagram: Assessment of bulk material with $1 \text{ M}\Omega \text{ m} < \rho \leq 10 \text{ G}\Omega \text{ m}$ .....		94
Figure 3 – Flow diagram: Assessment of bulk material with $\rho > 10 \text{ G}\Omega \text{ m}$ .....		95
Figure 4 – Difference between earthing and bonding .....		112
Figure 5 – Hazardous earthed conductor in contact with a flowing insulator .....		117
Figure A.1 – Equivalent electrical circuit for an electrostatically charged conductor.....		126
Figure B.1 – Calculated maximum safe filling velocities for medium sized tanks (see 7.3.2.2.5.2) .....		135
Figure F.1 – Flowchart for a systematic electrostatic evaluation.....		148
Figure G.1 – Test sample with applied electrodes .....		150
Figure G.2 – Measuring cell for powder resistivity .....		156
Figure G.3 – Measuring cell for liquid conductivity .....		158
Figure G.4 – Ignition probe .....		166

Figure G.5 – Perforated plate of ignition probe.....	167
Figure G.6 – Example of an arrangement for measurement of charge decay.....	169
Figure G.7 – Electrodes for measuring breakthrough voltage of sheets.....	171
Table 1 – Boundary limits at (23 ± 2) °C and (25 ± 5) % RH for the characterisation of solid materials and examples for the classification of objects.....	26
Table 2 – Maximum allowed isolated capacitance in Zones with explosive atmosphere.....	29
Table 3 – Restriction on size of insulating solid materials in hazardous areas.....	31
Table 4 – Maximum acceptable transferred charge.....	35
Table 5 – Requirements for conveyor belts.....	36
Table 6 – Requirements for transmission belts.....	37
Table 7 – Conductivities and relaxation times of some liquids.....	40
Table 8 – Precautions for filling large conductive tanks with low conductivity liquids.....	45
Table 9 – Filling rate limits for filling medium-sized vertical-axis tanks through schedule 40 pipes.....	51
Table 10 – Velocity and filling rate limits for loading low conductivity liquids into short (N=1), fixed horizontal axis tanks via schedule 40 pipes.....	52
Table 11 – Vehicles and compartments suitable for high-speed loading for ADR compliant vehicles.....	53
Table 12 – Influence of the sulphur content on middle distillate vd limits for road tankers.....	54
Table 13 – Velocity and filling rate limits for road tankers based on schedule 40 pipes; rates for hoses will be similar.....	54
Table 14 – Velocity and filling rate limits for loading rail tankers.....	55
Table 15 – Classification of end-to-end hose resistances for control of hazards from static electricity and stray current.....	68
Table 16 – ISO 8031 classification of hose grades.....	70
Table 17 – Hybrid grades of hoses and hose assemblies.....	71
Table 18 – Hose selection Table for flammable liquid service.....	72
Table 19 – Use of the different types of FIBC.....	100
Table 20 – Inner liners and FIBC: combinations that are permissible and not permissible in hazardous atmospheres.....	101
Table 21 – Determination of requirement for electrostatic dissipative protective clothing and other items of personal protective equipment.....	107
Table 22 – Summary of maximum earthing resistances for the control of static electricity in hazardous areas.....	114
Table A.1 – Charge build up on powders.....	125
Table A.2 – Values of capacitances for typical conductors.....	129
Table C.1 – Typical MIE intervals with examples.....	141
Table C.2 – Minimum ignition energy MIE and minimum ignition charge MIQ.....	142
Table G.1 – Volume concentrations of flammable gas mixtures.....	165

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### EXPLOSIVE ATMOSPHERES –

#### Part 32-1: Electrostatic hazards, guidance

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC/TS 60079-32-1, which is a technical specification, has been prepared by IEC Technical Committee 31: Equipment for explosive atmospheres, and IEC Technical Committee 101: Electrostatics.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
31/1033/DTS	31/1076/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60079 series, under the general title *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

transformed into an International standard,  
reconfirmed,  
withdrawn,  
replaced by a revised edition, or  
amended.

A bilingual version of this publication may be issued at a later date.

## INTRODUCTION

This IEC Technical Specification is based on CENELEC TR 50404:2003, *Code of practice for the avoidance of hazards due to static electricity* and a number of other documents:

- from the UK: BS 5958, Parts 1 & 2:1991, *Control of undesirable static electricity*,
- from Germany: TRBS 2153:2009, *Preventing risks of ignition due to electrostatic charges*,
- from Shell International Petroleum: *Static electricity – Technical and safety aspects*,
- from the US: NFPA 77, *Recommended Practice on Static Electricity (2007)*,
- from Japan: JNIOOSH TR42, *Recommendations for Requirements for Avoiding Electrostatic Hazards in Industry (2007)*,
- from ASTM, EUROPIA, IEC, International chamber of shipping, ISO etc.

It gives the best available accepted state of the art guidance for the avoidance of hazards due to static electricity.

This document is mainly written for designers and users of processes and equipment, manufacturers and test houses. It can also be used by suppliers of equipment (e.g. machines) and flooring or apparel when no product family or dedicated product standard exists or where the existing standard does not deal with electrostatic hazards.

A second part, IEC 60079-32-2, *Electrostatic Hazards, Tests*, is under development.

## EXPLOSIVE ATMOSPHERES –

### Part 32-1: Electrostatic hazards, guidance

#### 1 Scope

This part of IEC 60079 gives guidance about the equipment, product and process properties necessary to avoid ignition and electrostatic shock hazards arising from static electricity as well as the operational requirements needed to ensure safe use of the equipment, product or process. It can be used in a risk assessment of electrostatic hazards or for the preparation of product family or dedicated product standards for electrical or non-electrical machines or equipment.

The hazards associated with static electricity in industrial processes and environments that most commonly give problems are considered. These processes include the handling of solids, liquids, powders, gases, sprays and explosives. In each case, the source and nature of the electrostatic hazard are identified and specific recommendations are given for dealing with them.

The purpose of this document is to provide standard recommendations for the control of static electricity, such as earthing of conductors, reduction of charging and restriction of chargeable areas of insulators. In some cases static electricity plays an integral part of a process, e.g. electrostatic coating, but often it is an unwelcome side effect and it is with the latter that this guidance is concerned. If the standard recommendations given in this document are fulfilled it can be expected that the risk of hazardous electrostatic discharges in an explosive atmosphere is at an acceptably low level.

If the requirements of this document cannot be fulfilled, alternative approaches can be applied under the condition that at least the same level of safety is achieved.

Basic information about the generation of undesirable static electricity in solids, liquids, gases, explosives, and also on people, together with descriptions of how the charges generated cause ignitions or electrostatic shocks, is given in the annexes and in IEC/TR 61340-1.

This Technical Specification is not applicable to the hazards of static electricity relating to lightning or to damage to electronic components.

This Technical Specification is not intended to supersede standards that cover specific products and industrial situations.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IEC 60079-10-1, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres*