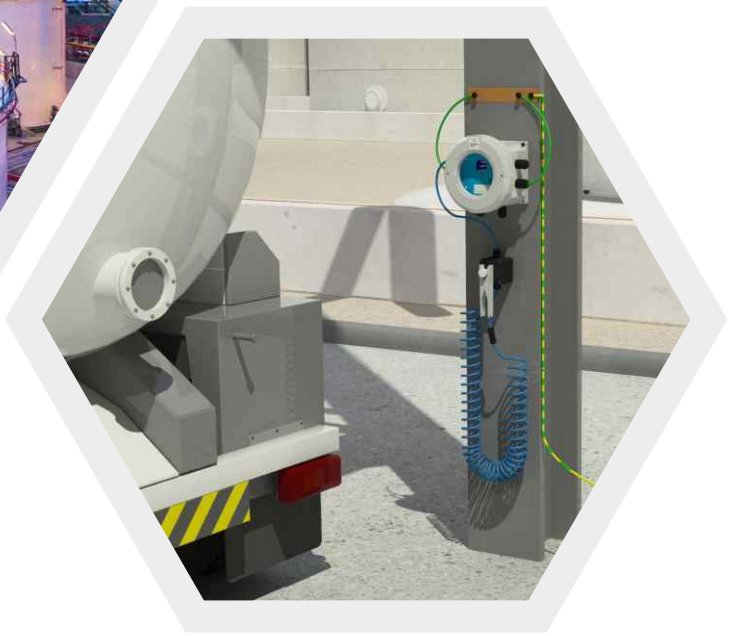




NewsonGale
HOERBIGER Safety Solutions

Leading the way
in hazardous area
static control



Grounding & Bonding Applications

Controlling static electricity in hazardous areas

Issue 4

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Newson Gale
HOERBIGER Safety Solutions

Headquartered in Nottingham in the heart of the United Kingdom, we develop and manufacture a range of hazardous area hardware solutions dedicated to mitigating the accumulation of static electricity on process equipment.

Newson Gale® is a company committed to mitigating the ignition hazards of static electricity.

ATEX IECEx C SP US SIL 2 INMETRO

Controlling static electricity in hazardous areas

This Grounding and Bonding Handbook highlights some of the processes that can be susceptible to static charge accumulation.



Various guidelines referred to in the Handbook can provide more detail on these processes. It should be noted, however, that not all processes at risk of electrostatic discharges can be highlighted in a single document. For professional advice on electrostatic hazard identification please refer to specialist consultants or internal hazardous process experts within your company. Newson Gale does not provide such services and focuses solely on providing customers with grounding and bonding hardware solutions for applications that have been identified at site.

If you want to discuss a particular application or product feel free to

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Full details are also provided on the back cover.

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Static electricity as a hazard

Static electricity can be described in a number of different ways, but it is, essentially, electricity stuck in one place. In a normal electrical circuit, charges that form an electrical current move through a closed circuit in order to do something beneficial, like power a computer or the lighting in your house. In these circuits, the charge always returns to the source from which it has been supplied. Static electricity is different. Because it is not part of a closed circuit static electricity can accumulate on plant equipment ranging from road tankers to flexible intermediate bulk containers.

Although static electricity is generally regarded as a nuisance, in the hazardous process industries it can become an ignition source. Discharges of static electricity have been identified as the ignition source in a broad range of processes. It is as potent as sparks resulting from mechanical and electrical sources, and yet, it is often underestimated, either due to a lack of awareness of the risks it poses or because of neglect and/or complacency.

Legislation concerning static electricity in hazardous area process industries

The ignition risk posed by static electricity is addressed in European and North American legislation. In Europe Annex II of the ATEX Directive 2014/34/EU within Section 1.3.2 states - “Hazards arising from static electricity:- Electrostatic charges capable of resulting in dangerous discharges must be prevented by means of appropriate measures”. Thus, “electrostatic discharges” are a known potential ignition source and must be considered as part of the explosion risk assessment.

In the US, the Code of Federal Regulations that addresses hazardous location activities, 29 CFR Part 1910 “Occupational Safety and Health Standards”, states that all ignition sources potentially present in flammable atmospheres, including static electricity, shall be mitigated or controlled.

Section 10.12 of Canada’s Occupational Health and Safety Regulations (SOR/86-304) states that if a substance is flammable and static electricity is a potential ignition source that the employer “shall implement the standards set out in the United States National Fire Protection Association, Inc. publication NFPA 77, Recommended Practice on Static Electricity.”



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Industry Codes of Practice

NFPA 77 “Recommended Practice on Static Electricity” is one of a number of industry codes of practice that addresses the ignition hazards of static electricity. In recognition of the ignition risks posed by static electricity these publications are produced and edited by committees of technical experts that participate in the hazardous process industries. The following publications are dedicated to helping QHSE professionals and plant engineers identify and control electrostatic ignition sources.

All information provided is in line with NFPA 77 “Recommended Practice on Static Electricity” and IEC TS 60079-32-1 “Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance”. This information is readily available in the public domain; contact www.NFPA.org and www.IEC.ch.

In providing this advice, Newson Gale is not undertaking to render professional or other services for or on behalf of any person or entity, nor undertaking to perform any duty owed by any person or entity to someone else. Anyone using this information should rely on his or her own judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance.

Leading the way in hazardous area static control



Publisher	Title	Metal Grounding Circuits	FIBC Type C
International Electrotechnical Commission	IEC TS 60079-32-1: Explosive Atmospheres, Electrostatic Hazards - Guidance	10 Ω	1 x 10^8 Ω
National Fire Protection Association	NFPA 77: Recommended Practice on Static Electricity	10 Ω	1 x 10^7 Ω
American Petroleum Institute	API RP 2003: Protection against Ignitions Arising out of Static, Lightning and Stray Currents	10 Ω*	N/A
American Petroleum Institute	API 2219: Safe Operation of Vacuum Trucks in Petroleum Service	10 Ω	N/A
International Electrotechnical Commission	IEC 61340-4-4: Electrostatic classification of Flexible Intermediate Bulk Containers	N/A	1 x 10^8 Ω

Table 1: List of industry codes of practice designed to prevent ignitions caused by static electricity
* API RP 2003 States that 10 Ω is 'satisfactory'

NOTE : Always check for and read the latest version of the International Standards and/or Recommended Practices

The basics of the hazard

When a high resistivity liquid, gas or powder becomes electrostatically charged during process operations, it could charge electrically isolated conductive plant, equipment and materials that are in direct contact with it, or in close proximity to it.

It is scenarios where the hidden increase in the voltage of the charged object presents the static ignition risk. This is because static sparks are caused by the rapid ionisation of the atmosphere between the charged object and objects that are at a lower voltage. When the voltage of the object hits a critical level that exceeds the breakdown voltage of the medium present in the gap between the charged object, *C1*, and uncharged object, *C2*, ionisation occurs, which presents a conductive path for the charges to pass through the gap in the form of a spark.

The total energy available for discharge is based on the voltage (*V*) of the object and its capacitance (*C*) based on the formula shown below:

$$V = \frac{Q}{C}$$

Where:

V = voltage of charged object (Volts)

Q = total quantity of charge on the object (Coulombs)

C = capacitance of charged object (Farad)

Source: NFPA 77, 6.3.1

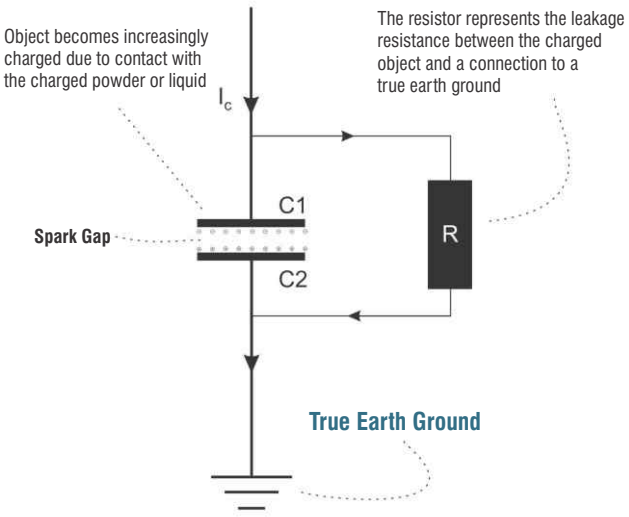


Figure 1: Basic model of why objects can accumulate static electricity.
Ref: IEC TS 60079-32-1, Figure A.1



Real world scenarios

As described in Figure 1 the objective of grounding is to mitigate electrostatic voltage increase during the process. Charge accumulation is likely to occur if there is a high enough resistance present between the equipment and general mass of earth.

Connections to the mass of the earth should be provided by high integrity earth grounds present on the site. These high integrity earth grounds will normally be providing paths to ground for lightning and electrical fault currents, and should be suitable for dissipating static electricity (ref: NFPA 77, 7.4.1.3.1).

The performance and condition of high integrity grounding points are the responsibility of the site owner and need to be verified on a regular basis by a site appointed competent electrical person.

Tables 2a and 2b detail Minimum Ignition Energy (MIE) of some common liquids and powders used in process industries. If an object becomes isolated and the static voltage increases on it then the charge on the object can quickly achieve a value above the products MIE and therefore be capable of igniting these flammable materials.

But what can cause equipment to become isolated? Table 3a and 3b provides examples of equipment that can become isolated and the reasons for it.

Examples of Minimum Ignition Energies

The Minimum Ignition Energy (MIE) is the lowest energy required to ignite flammable materials. Table 2 highlights various materials and their MIE values.

Liquid / Gas	MIE
Methanol	0.14 mJ
MEK	0.53 mJ
Ethyl Acetate	0.46 mJ
Acetone	1.15 mJ
Benzene	0.20 mJ
Toluene	0.24 mJ

Table 2a: List of flammable liquids and gases and their corresponding Minimum Ignition Energies

Powder	MIE
Magnesium Stearate	03 mJ
Polyethylene	10 mJ
Aluminium	50 mJ
Cellulose Acetate	15 mJ
Sulphur	15 mJ
Polypropylene	50 mJ

Table 2b: List of combustible powders and their corresponding Minimum Ignition Energies

Examples of Capacitance of various items

Item	Capacitance (pF)
Tank Car	1000
Automobile	500
Person	100 - 300
Oil/Solvent drum	10 - 100
Metal scoop	10 - 20
Needle electrode	1
Dust particle	10^{-7}

Table 3a: Examples of Capacitance
IEC TS 60079-32-1: Table A.2
NFPA 77: Table A.3.3.5

Causes of Capacitance

Objects	What causes capacitance?
Portable drums	Protective coatings, product deposits, rust
Road Tankers	Rubber tyres
Piping	Rubber and plastic seals, anti-vibration pads and gaskets
Rail Tankers	Grease, vibration pads isolating tank from rails. Rails isolated from loading gantry
Hoses	Broken internal helixes and bonding connectors
FIBC	Non-conductive fabric / damaged static dissipative threads
People	Human bodies
Scoops	Material of construction

Table 3b: Equipment at risk of static charge accumulation and what can cause electrical isolation.

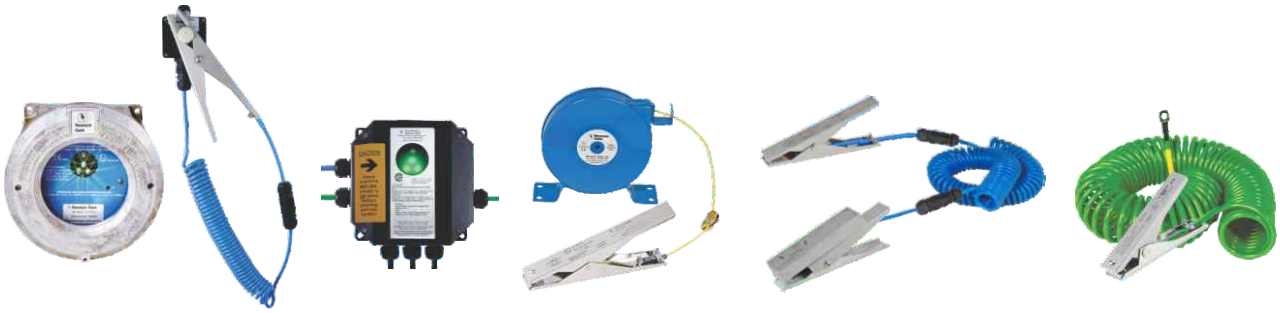
Grounding and Bonding Applications

The following pages identify the most common processes that require static grounding and bonding.

References from the various industry codes of practice listed in the Contents page of this Handbook are provided alongside a brief explanation of the electrostatic ignition hazard behind individual processes.

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Operator Training

Operator training is essential and should not be overlooked. Operators working in EX/HAZLOC areas should be trained on the basics of static electricity as a potential ignition source as they are, ultimately, the day-to-day users of the grounding and bonding equipment that has been specified and installed at the site.

They should be trained on the intended function and correct use of the grounding equipment and where the use of the grounding equipment fits within the standard operating procedures of the company. As a basic minimum for most application scenarios (e.g. grounding a metal drum) they should follow the principle of making grounding connections as the first step in the process and to not remove the ground connection until the process is complete.

Operators should be trained to avoid scenarios where, for example, if grounding systems interlocked with the process have their grounding connections removed during the process, thereby initiating an emergency shutdown of the process (e.g. switching off a pump), there could still be movement of material after the machine has stopped, thereby carrying the risk of continued static charge generation.

If operators notice that equipment has been changed or damaged (e.g. fraying cable connections) they should be encouraged to report this to the relevant person at the location (line manager, local QSHE, maintenance personnel) and not use the equipment until a competent person has deemed the equipment safe and appropriate for use.

Not providing training risks incorrect use of the grounding equipment and/or not following company standard operating procedures with respect to static electricity controls.

General Requirements

Where asset owners deem it necessary to provide static grounding for equipment of metallic construction this can be achieved by connecting the equipment to a verified true earth ground.

The true earth ground provided by the site owner should have a low resistance connection to the general mass of the earth. Verified grounds that provide earthing of electrical circuits and lightning protection circuits are more than adequate for static electricity (NFPA 77, 7.4.1.3.1).

For the resistance between the object that is being grounded via the verified true earth ground (e.g. installed bus-bar network) less than 10 Ohms is generally regarded as the benchmark for metal to metal circuits. This recommendation is based on the idea that indicators of loose connections and corrosion will show electrical resistances higher than 10 Ohms. (NFPA 77, 7.4.1.3.1 and IEC TS 60079-32-1).

Options ranging from basic clamps to grounding systems can be specified. Systems with ground status indicators can provide operators with the benefit of a visual indication of a 10 Ohm or less connection to the metal object to be grounded. An additional control can be the use of a grounding system with an interlock function. This would require a permissive output from the grounding system's contact with the site owner's process that is controlling the initiation of the process. This supports the principle of *"clamp on first – off last"*, so that grounding of the equipment is the first step in the process.

When the grounding system establishes a 10 Ohm or less connection between the equipment and verified true earth ground the ground status indicators switch from red to flashing green. Such a grounding system will monitor the resistance between the object requiring grounding and the site verified true earth ground to 10 Ohms or less. It should be emphasized that the grounding system is establishing a circuit between the object to be grounded and the site's verified true earth ground network. It is not verifying if the true earth ground network has a connection to the general mass of the earth.

It is the site owner's responsibility to verify that the ground network has a low enough resistance connection to the general mass of earth based on their national electrical earthing and lightning protection standards.

As with any item of equipment it is essential that the grounding system is installed in accordance with the instruction manual. If the system is not installed in accordance with the instruction manual and the hazardous area certificate, hence the safe operation of the system and the warranty are both invalidated.

Ground connections should never be removed when the process is underway and should never be attached if the operator has not followed the *"clamp-on-first"* principle, e.g. where the process has started before the grounding clamp has been attached as this could lead to a static discharge.

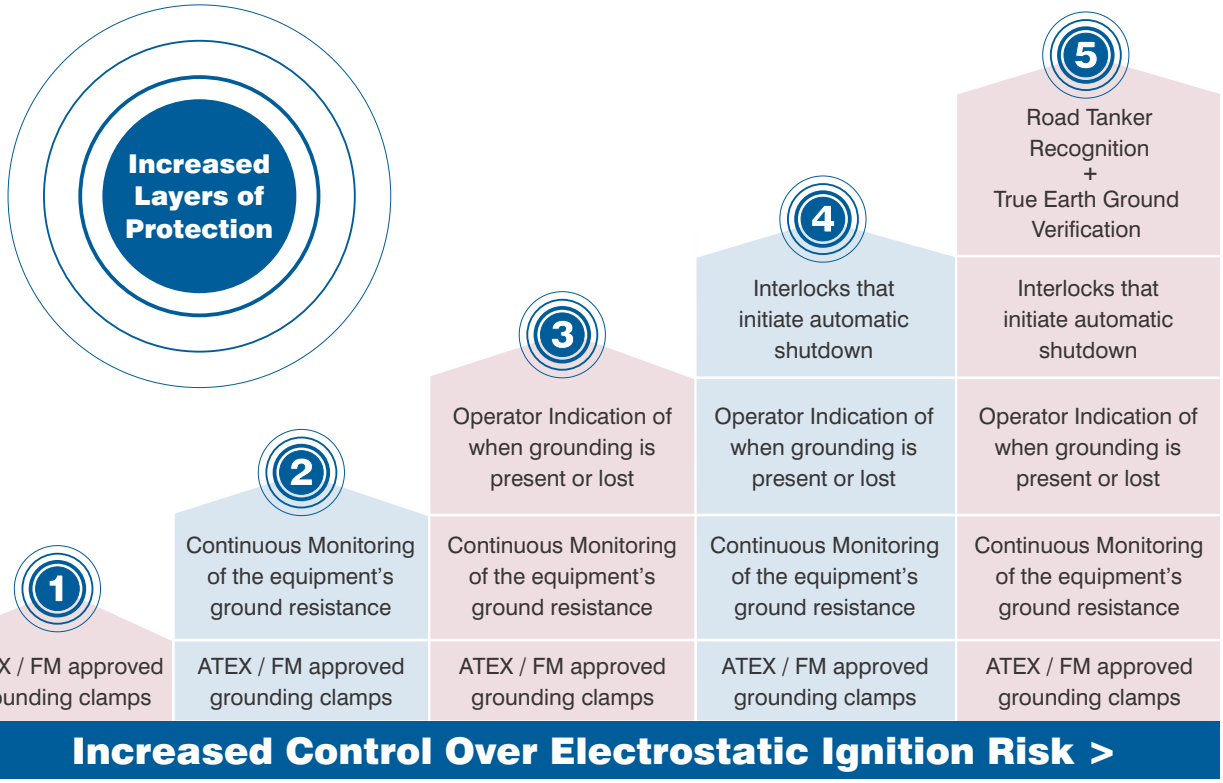
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Increased Layers of Protection





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Earth-Rite® Range Static ground monitoring & interlock systems

The Earth-Rite range of static grounding and interlock systems provide an optimum level of control for mitigating against the risk of static charge accumulation.

All Earth-Rite systems feature electronics that continuously monitor the ground path resistance between the grounded object and a verified grounding point, operator displays with LED indicators and internal relays that can be interlocked with the liquid or powder transfer equipment.

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Earth-Rite® II RTR™

Road tanker truck flammable product transfer



Earth-Rite® II PLUS™

Filling, mixing and blending of flammable / combustible materials in drums, IBCs, totes, portable containers, mobile Tanks and railcars



Earth-Rite® II FIBC

Filling or discharging Type C FIBCs in flammable or combustible atmospheres



Earth-Rite® II MGV

Truck mounted static earthing verification



Earth-Rite® MULTIPOINT II

Multiple grounding of potentially isolated conductive components of manufacturing and processing systems



Earth-Rite® OMEGA II

Compact panel mounted static grounding module



Earth-Rite® DGS

Dual grounding system

Grounding a road tanker with system interlocks and indication

When an ungrounded road tanker is being filled/emptied with a liquid or powder, the road tanker could accumulate enough static to pose a discharge risk.

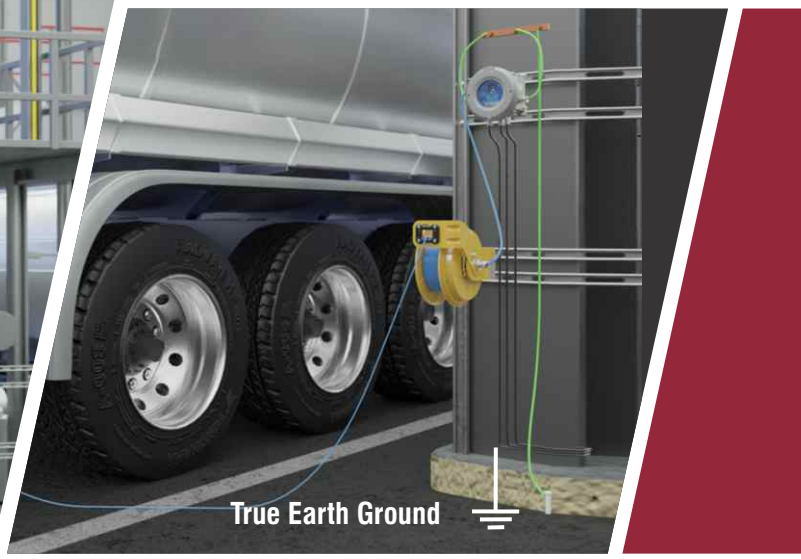
To counteract this risk, it is important to ensure that the road tanker does not have the capacity to accumulate static electricity. The most practical and comprehensive way of achieving this is to make sure that the road tanker is at earth potential, especially before the transfer process starts.

This is because the general mass of the Earth has an infinite capacity to balance charges which in turn minimises the accumulation of static in the road tanker, and mitigates the generation and presence of voltages on the road tanker.

Using a grounding system can increase the safety and efficiency of the loading/unloading process by reducing the need to physically measure the bond between the earth bar and the road tanker to ensure it is in good condition.

Having a simple display coupled with education of the drivers/operators that they must attach the grounding clamp as the primary function ensures repeatable reliability of use. When using a grounding system to ground and monitor the road tanker, a permissive state can clearly be indicated to the driver/operator by GREEN flashing LEDs whilst utilising interlock relays can assist in improving the safety of the loading/unloading process.





IEC TS 60079-32-1, 7.3.2.3.3
"Precautions for road tankers" states:

1) Earthing and bonding

a) The bonding resistance between the chassis, the tank and the associated pipes and fittings on the truck should be less than 1 MΩ. For wholly metallic systems, the resistance should be 10 Ω or less and if a higher value is found further investigations should be made to check for possible problems of e.g. corrosion or loose connection.

b) An earthing cable should be connected to the truck before any operation (e.g. opening man lids, connecting pipes) is carried out. It should provide a resistance of less than 10 Ω between the truck and the gantry's designated earthing point and should not be removed until all operations have been completed.

c) It is recommended that the earth cable required in b) be part of a static earth monitoring system that continuously monitors the resistance between the truck and a designated earthing point on the gantry and activates interlocks to prevent loading when this resistance exceeds 10 Ω.

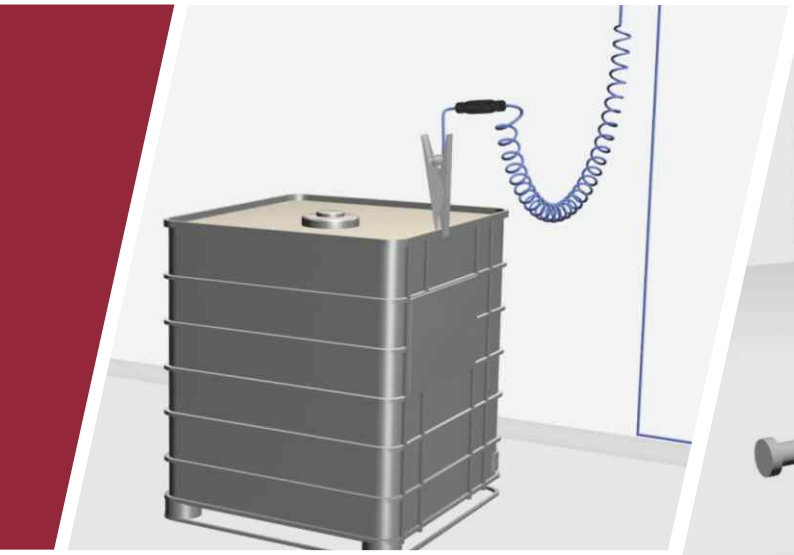
Grounding railcars, IBCs and drums with system interlocks and indication

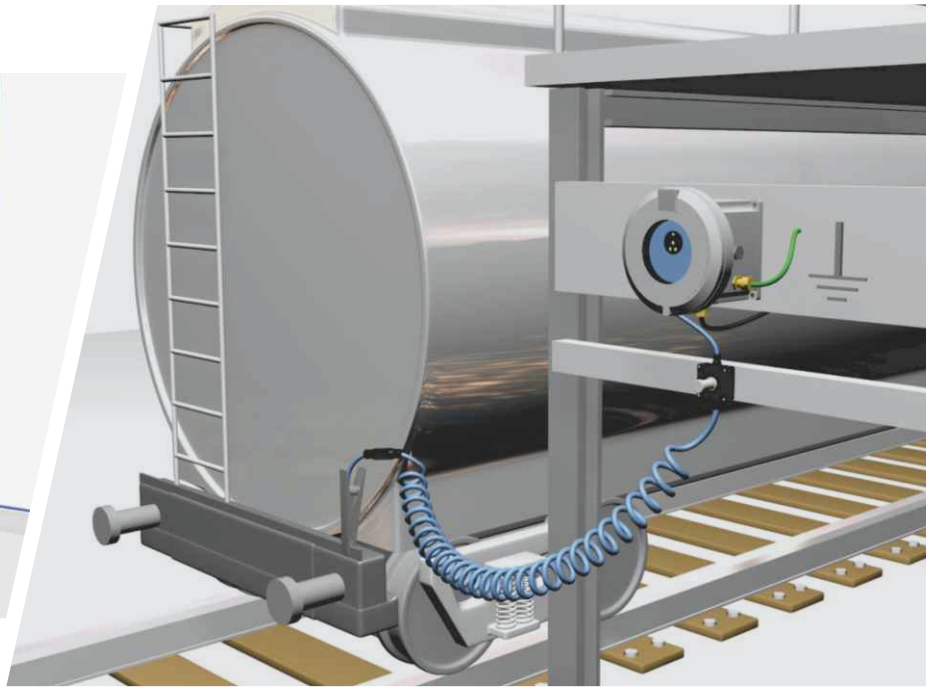
Isolated conductive metal objects like railcars, LACT units, skids and IBCs that come into contact with electrostatically charged liquids can accumulate high levels of electrostatic charge.

If an ungrounded object is allowed to accumulate electrostatic charges, the voltage present on the object rises dramatically in a very short space of time. Because the object is at a high voltage, it seeks to find ways of discharging this excess energy and the most efficient way of doing this is to discharge the excess charge in the form of a spark.

Grounded objects that are in close proximity to charged objects are potential targets for electrostatic discharges.

If the transfer system is not grounded, the electrostatic voltage of objects like railcars can build up to hazardous levels in a short time period.





IEC TS 60079-32-1, 13.3.1.4
"Movable metal items" states:

Where such situations are expected, the object should be earthed by an alternative means (e.g. earthing cable). A connection resistance of 10 Ω between the cable and the item to be earthed is recommended. Earthing and bonding need to be continuous during the period that charge build-up could occur and cause electrostatic hazards.

NFPA 77, 12.4.1 & 12.4.2.
"Railroad Tank Cars" states:

In general, the precautions for railroad tank cars are similar to those for tank vehicles specified in Section 12.2*.

*Section 12.2:

Many tank cars are equipped with non conductive bearings and nonconductive wear pads located between the car itself and the trucks (wheel assemblies). Consequently, resistance to ground through the rails might not be low enough to prevent accumulation of a static charge on the tank car body. Therefore, bonding of the tank car body to the fill system piping is necessary to protect against charge accumulation.

*Table 12.2:

Tank trucks should be bonded to the fill system, and all bonding and grounding should be in place prior to starting operations. Ground indicators, often interlocked with the filling system, frequently are used to ensure bonding is in place.

Earth-Rite® II PLUS™

Dual grounding of two independent plant items

There are times when one or two plant items need to be grounded simultaneously and both of their grounding connections monitored to less than 10 Ohms.

This feature is commonly used to ground trucks and tank cars during transloading operations or to ground up to two trucks or tank cars that are being loaded/unloaded at dedicated loading rack installations. If these vessels encounter electrostatically charged liquids and powders, they have the potential to accumulate hazardous levels of electrostatic charge that has the capability of discharging static sparks with energies far in excess of the minimum ignition energies of a vast range of combustible gases, vapours and dusts.

Interlocking the grounding system with the process equipment being used enhances the safety and operating procedure before the process starts. If the ground is lost the system can shut down the process for one or both of the channels.

Interlocking the grounding system with strobes provides personnel working in the surrounding area with a clear view of when the grounded process is underway and protected.





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Vehicle drive-offs

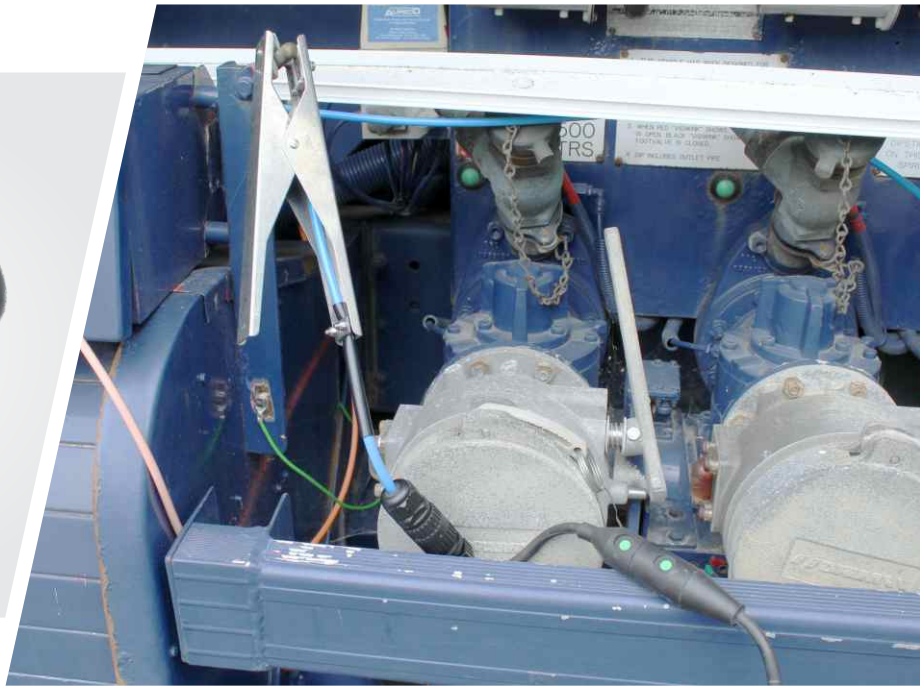
Road tanker drivers must be educated to attach the grounding clamp and system to the designated earth point on the road tanker as soon as they leave the cab and before they start any other operation or product transfer (do not attach hoses, lower legs, etc).

After the product transfer and all other activities have been completed the driver can remove the earthing clamp and put it back on the earthing system stowage point before driving off.

Occasionally this simple process of removing and stowing the clamp and cable by the driver fails to be completed and the road tanker is driven off with a risk of damage to the clamp, cable or reel. This type of incident could also prevent further use of the grounding equipment.

Fitting an in-line break away connector into the grounding clamp and cable assembly enables the male half of the connector to separate from the clamp if the road tanker is driven off prematurely.





Truck mounted static ground verification with system interlocks and indication

Normally, road tankers (tank trucks) load/unload at a fixed point in a factory. However, vacuum trucks can work anywhere from main roads/highways to refineries/chemical plants and require a different grounding solution.

Continuity between all metal parts on the vacuum truck is essential. Every metal item must be bonded to the chassis and tank with caution towards paint, coatings and hose trays.

The most crucial aspect of safety concerning vacuum trucks is the education of the operator that on arrival at site they attach the grounding clamp first and get a GREEN flashing LED that clearly shows that the truck is grounded before any other operations are started e.g. attaching hoses.

The second most crucial part is to remove the clamp after all other operations have been completed and equipment packed away - clamp on first and clamp off last.

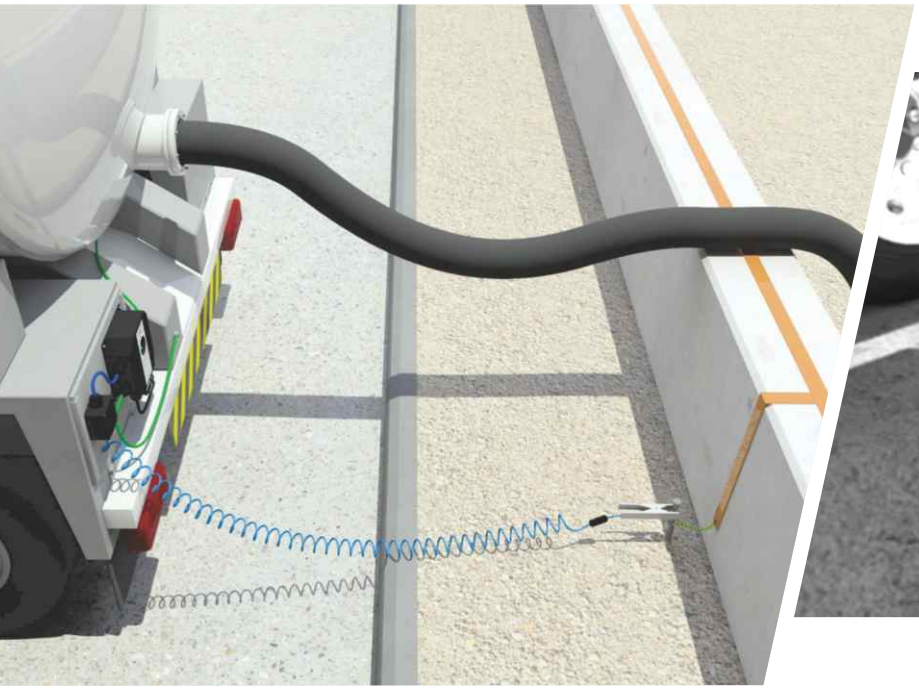
A lot of users fit a simple hand wound or retractable cable reel and clamp to protect vacuum trucks and road tankers. The advantage to installing a monitored grounding system will alert users of the following dangers:

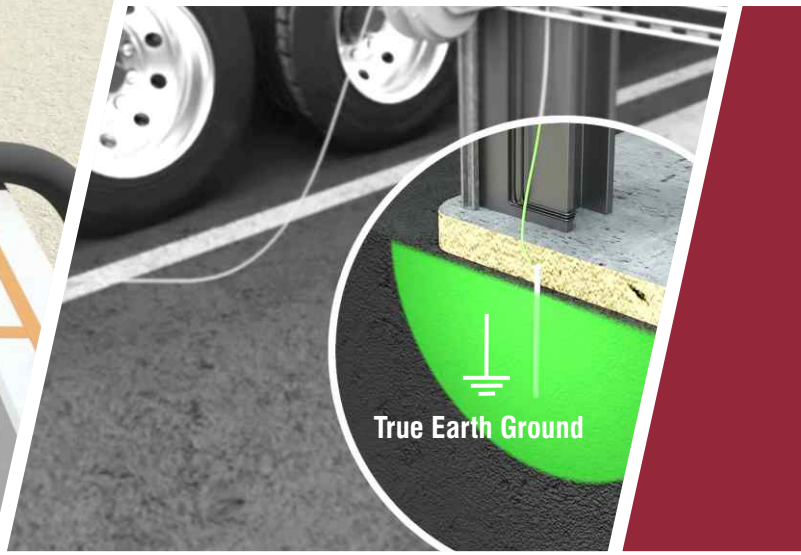
> The grounding system will provide a visual indication of a GOOD or BAD ground connection.

> The grounding system will provide true earth verification e.g. is the system connected to an earth that is capable of dissipating static electricity.

> The grounding system is a monitored circuit and will automatically shut down the product transfer if the ground connection is lost. However, the product itself would need to stop moving in order to prevent any further charge generation.

The grounding system complies with International Standards e.g. <10 Ohms metal to metal loop resistance between the teeth of the clamp and the chassis/tank of the vacuum truck.





The installation of a truck mounted grounding system requires an experienced EX/HAZLOC electrical engineer who will be able to complete a satisfactory installation that complies with EX/HAZLOC approval requirements and code.

Most importantly read the manual and install the EX/HAZLOC truck mounted grounding system as per the manufacturer's instructions and the approval control drawings for the best operational results and safety.

The side and rear of the vacuum truck are the typical positions where the grounding system can be sited. This allows the driver to see the GOOD or BAD grounding signal whilst using the other controls of the truck. The side and rear of the vacuum truck are usually Ex zoned areas.

Always choose a grounding system with an intrinsically safe (ia) signal out to the clamp for the upmost safety.

Depending on construction, grounding clamps supplied by an intrinsically safe (ia) signal can go anywhere in a hazardous area/location (Zone 0 / Class I, Div. 1).

Depending on construction, grounding clamps supplied by an intrinsically safe (ib) signal can only go into a hazardous area/location (Zone 1, 2 / Class I, Div. 2).

A high intensity coloured light can be placed on the top of the truck and interlocked with the grounding system. This supplements the grounding system and allows the driver and all other team members to clearly see the condition of the grounding system and react accordingly.

If the vacuum truck often visits a remote loading site then it is good idea to get a verified grounding point installed and checked regularly by a responsible person. Rods in the ground are normally a good way of providing this designated grounding point.

If the vacuum truck rarely visits the remote loading site then a fully featured truck mounted grounding system will be required to let the driver test metallic objects installed in the earth near to the transfer point to see if any are suitable for use as a grounding point and therefore protect the product transfer, plant and personnel.

There are a number of International standards and Industry recommendations that relate to the safe use of vacuum trucks and static electricity.

Always check to make sure that you are consulting the latest version of the International Standards and or Recommended Practises.

IEC TS 60079-32-1, Explosive atmospheres
Part 32-1: Electrostatic hazards, guidance

8.8.4 Vacuum trucks

Vacuum trucks should be connected to a designated site earth before commencing any operations. In areas where site earths are not present, i.e. where portable earthing rods are required, or there is doubt regarding the quality of site earths, the resistance to earth should be verified prior to any operation. When the truck is connected to a verified earth, the connection resistance between the truck and verified earth should not exceed 10 Ohms for pure metallic connections or 1 Meg-Ohm for all other connections. This requirement should be verified with a truck mounted earthing system or portable ohmmeter. The electrostatic suitability of the hoses used should also be verified in accordance with 7.7.3 or 9.3.3.

ADR Volume 2 - Concerning the International Carriage of Dangerous Goods by Road

Chapter 4.5 Use of Vacuum Operated Waste Tanks and: 6.9.2.14.3

All components of the shell shall be electrically connected to each other and to the metal parts of the service and structural equipment in contact with each other shall not exceed 10 Ohms.

Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

API Recommended Practice 2219, Sections 3.2, 3.7, 5 to 5.5.3

Protection against Ignitions Arising Out of Static, Lightning, and Stray Currents
API Recommended Practice 2003

Recommended Practice on Static Electricity
NFPA77, Section 12.3 Vacuum Trucks

WJTA - Water Jet Technology Association
(USA & Canada)
Vacuum Truck Safety Practices
Recommended Practices for Industrial Vacuum Services

SIR - Stichting Industriële Reining (Holland & Belgium)

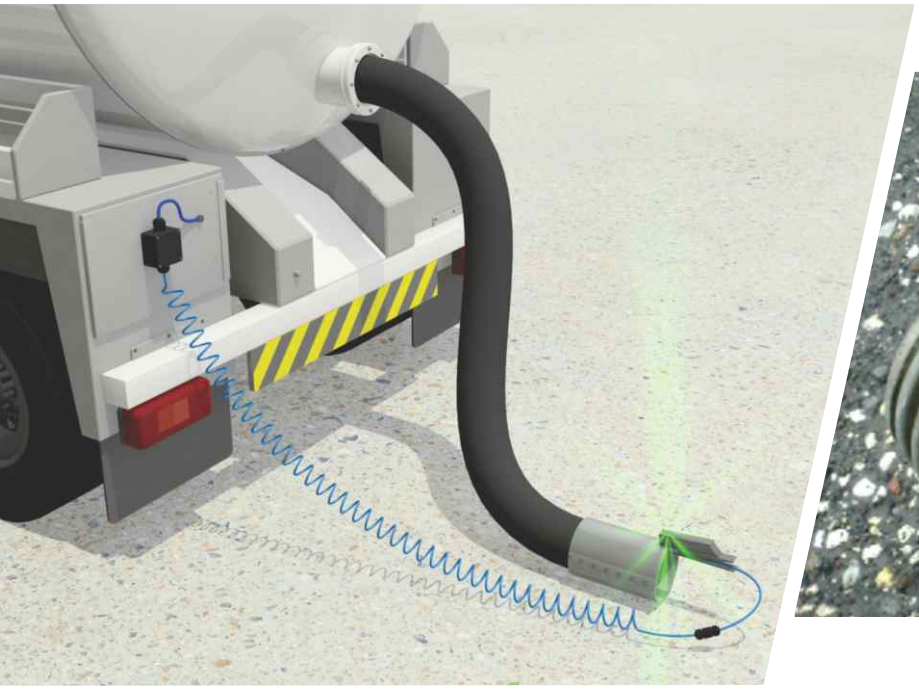
Hose testing and electrical continuity testing with visual indication

Hoses play an important role in hazardous area operations and owing to their direct interaction with moving liquids and powders can be at risk of becoming electrostatically charged. At no point in its structure should the metal components of a hose be permitted to accumulate static electricity.

Examples of metal components that have the potential to accumulate static charge are couplings and metal wire helixes.

Periodic resistance testing of hoses with meters by a responsible person (experienced electrician) helps identify potentially faulty hoses so that they can be removed from service.

Another option is to supply drivers with an easy to use hose continuity tester that provides an LED indicator to indicate a PASS or FAIL test of the hose. It should be emphasised that drivers must be suitably trained as being competent to use such testers.





IEC TS 60079-32-1

7.7.3.3.1 “End-to-end electrical bonding (continuity).”
End-to-end electrical bonding is usually provided by reinforcing helix wires embedded in the hose wall, or braided metal sheaths bonded to conductive end couplings. It is important that each bonding wire or reinforcing helix is securely connected to the end couplings.

Connections between bonding wires and couplings should be robust and the resistance between the end couplings should be tested periodically. The frequency and type of testing will depend on the application and should be determined in consultation with the manufacturer.

*IEC TS 60079-32-1, Table 16 of 7.7.3.4 “Practical hose classifications” recommends a maximum end-to-end resistance of 100 Ohms for conductive hoses.

There a number of International guidelines that relate to the safe use of hoses and static electricity.

Always check to make sure that you are consulting the latest version of the International Standards and or Recommended Practises.

IEC TS 60079-32-1 - Section/s: 7.7.3 to 7.7.3.5

API RP 2219 - Section: 5.3 “Conductive and Non-conductive Hose”

Grounding interconnected plant assemblies and piping with system interlocks and indication

Powder processing operations can generate large quantities of electrostatic charge via the movement of powder. The most common cause behind the electrostatic charging of powder processing equipment is “tribo-electrification”.

In pharmaceutical operations, equipment like powder conveying systems, micronizers, blenders and sieve stacks all make up multiple component assemblies that can accumulate high levels of electrostatic charge should any of the components be isolated from a true earth ground.

Regular disassembly for cleaning and maintenance can result in bonding connections being missed or not being made correctly when the equipment is reassembled.

Regular flexing, vibration and corrosion can also degrade assembly connections so it is imperative to ensure that no parts in the assembly become isolated from a true earth ground.

Powder processing equipment presents more of a challenge compared to standard applications as there are many metal parts that can make up larger assemblies that are potentially electrically isolated from each other. It is therefore important to ensure that multiple components that come into contact with charged powders have a means of being monitored for static grounding protection purposes.

This application scenario is not limited to powder processing equipment. Multiple grounding points in liquid processing applications (e.g. multiple drum filling / railcar loading) can be managed with a single grounding system.



NFPA 77, 15.3.1 & 15.3.2
“Mechanisms of Static Electric Charging” states:

Contact static electric charging occurs extensively in the movement of powders, both by surface contact and separation between powders and surfaces and by contact and separation between individual powder particles.

Charging can be expected any time a powder comes into contact with another surface, such as in sieving, pouring, scrolling, grinding, micronizing, sliding and pneumatic conveying.

IEC TS 60079-32-1, 13.4.1 “The establishment and monitoring of earthing systems” states:

Where the bonding/earthing system is all metal, the resistance in continuous earth paths typically is less than 10 Ω. Such systems include those having multiple components. A greater resistance usually indicates that the metal path is not continuous, usually because of loose connections or corrosion. An earthing system that is acceptable for power circuits or for lightning protection is more than adequate for a static electricity earthing system.

Protecting Type C FIBC against static electricity

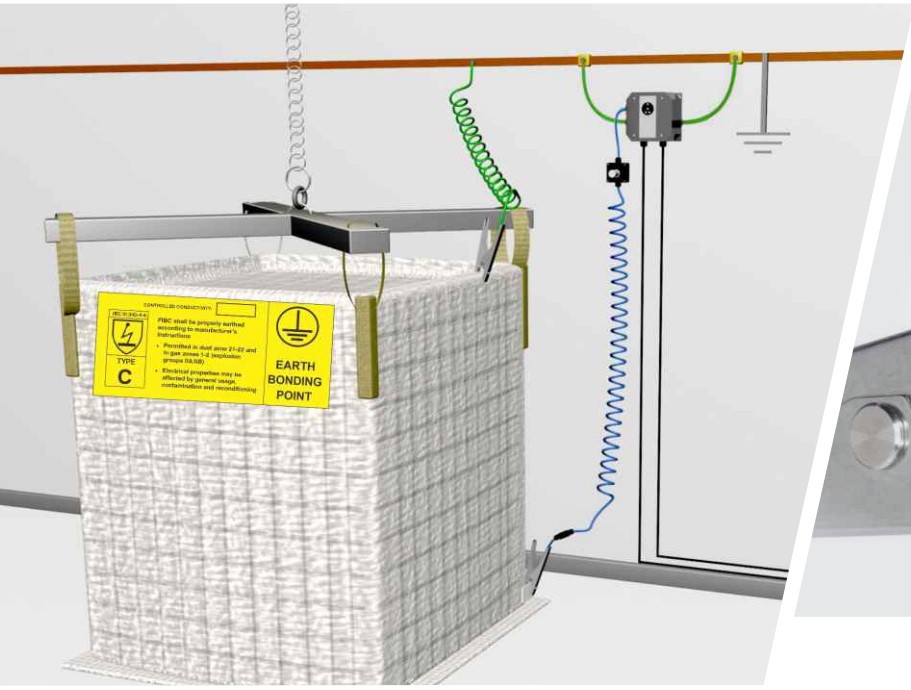
Type C FIBCs are made from conductive fabric or plastic sheet, or interwoven with conductive threads or filaments and designed to mitigate the occurrence of electrostatic discharges, brush discharges and propagating brush discharges.

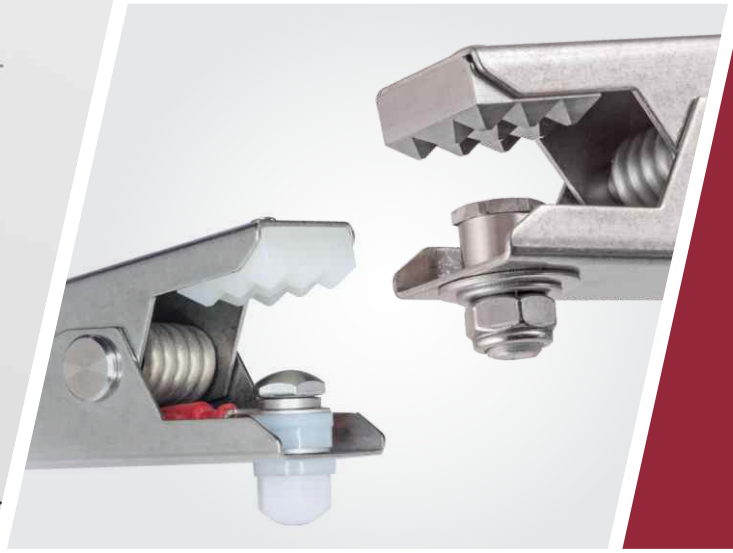
Type C FIBC bags should be provided with grounding tabs (usually sited at the top and bottom of the bag) that are electrically connected to the conductive material or thread and are intended to be connected to a ground point when the FIBC is filled or emptied to ensure static electricity does not accumulate on the bag.

Grounding Type C bags can be achieved with either passive (single pole clamp and cable) or through active means (monitoring systems). A grounding system can indicate if the resistance of the static dissipative threads are within the correct resistance range (100 Meg-Ohm or 10 Meg-Ohm). It does not validate the general condition of the bag, it checks to see if the interwoven conductive threads embedded in the material of the bag are in good electrical contact with the ground connection points.

Type C bags may also be supplied with inner liners. Electrical continuity between the liner and threads of the FIBC are not verified by grounding systems.

The suitability and general condition of the Type C bag is the site owner's responsibility.





The primary standard/s for the electrostatic classification of Type C bags are as follows:

BS EN 61340-4-4 "Electrostatics
Part 4-4: Standard test methods for specific applications – Electrostatic classification of flexible intermediate bulk containers (FIBC)" :

Foreword

a) In light of experimental evidence, the maximum resistance to ground for Type C FIBC, and corresponding resistance limits for inner liners used in Type C FIBC has been increased from 1.0 x 10^7 Ohms to 1.0 x 10^8 Ohms (100 Meg-Ohm)

7.3.1. Type C FIBC
"Resistance to groundable point of less than
1.0 x 10^8 Ohms (100 Meg-Ohm)

NFPA 77, Recommended Practice on Static Electricity

16.6 Flexible Intermediate Bulk Carriers (FIBC's)
16.6.6.3, "Type C FIBC"
The resistance between the conductive elements in the FIBC and the grounding tabs should be less than 1.0 x 10^7 (10 Meg-Ohm)

Panel mounted grounding with system interlocks

There are applications where electrical contractors may need to provide a static grounding solution as part of a specialised instrumentation/automation project. To satisfy the requirements of bespoke projects designers are often limited by standard “off-the-shelf” static grounding solutions that cannot be customised to provide a good “fit” for their specific application design requirements. A suitable design trade-off is to specify static grounding relays that can monitor a range of resistance values.

Although installations of this type are limited by not having ground status indication provided at the point of grounding, the normal application for such relays is to monitor the ground status of permanent fixed equipment connections or rotating machinery and using an internal relay to provide outputs to PLCs or customised HMI panels or panel mounted indication.

Due to the design of bearings, etc. a good method of providing ground continuity is to use a non-hazardous area mounted ground monitoring relay to test the ground connection to the drum or impeller via a pair of carbon brushes or a slip ring, acting on the shaft.

Relays that have a range of resistance settings are normally mounted on DIN rails inside electrical panels installed in non-hazardous areas.

Using a compact panel mounted static grounding module that can monitor a range of resistances with an output relay to interlock with control circuits or motor starters can assist with improving the safety of processes.





Dual core static ground monitoring and interlock systems

The Newson Gale static grounding systems Bond-Rite and Earth-Rite are complimented by our range of 2 core grounding clamps and Cen-Stat spiral cables.

The static grounding clamps are based upon a pair of sharp and incredibly hard tungsten carbide teeth and a torsion spring with very strong clamping force.

ATEX FM APPROVED



The Tungsten Carbide teeth and torsion spring combination ensure our clamps bite through connection inhibitors like paint, rust, product deposits and ensure a low resistance connection to the metallic object that needs to be grounded.

The low resistance measurement (less than 10 Ohms) to a verified ground is made by passing an Intrinsically Safe (ia) signal through the clamps so they can be used in any hazardous area or location (up to and including Zone 0, 20 / Class I, Div. 1).

The 2 core grounding clamps have ATEX and Factory Mutual approvals for use in these hazardous areas and locations.



Dual Core Large Sized Static Earthing Clamp



Dual Core Surface Mount Connector



Dual Core Medium Sized Static Earthing Clamp



Dual Core Magnetic Static Earthing Clamp

Grounding closed topped drums and containers

When flammable or combustible products are being handled and processed in hazardous areas it is essential to specify certified equipment that will protect personnel from sources of electrostatic ignition.

Grounding clamps are typically designed around torsion or compression springs. The spring type grounding clamps are ideal for many different applications. However, attaching a spring based grounding clamp to a flat or curving surface is not normally possible e.g. the body of a drum, totes or Ex IBCs.

The dual core, 2 pole static grounding clamps ensure positive contact with the equipment to be grounded. One of the 2 core grounding clamps is based upon the pair of sharp and incredibly hard tungsten carbide teeth and the strong torsion spring is replaced by an equally strong pair of Neodymium magnets.

With the power of magnetism together with tungsten carbide teeth provides a strong low resistance connection (≤10 Ohms) to any ferrous metal objects that are flat and/or round, allowing closed top drums to be filled with the cover fitted complete with extract connection, whilst still grounding and monitoring the ferrous metal drum.

The Newson Gale magnetic clamp has been rigorously assessed to IECEx standards to ensure they are capable of dissipating static electricity from potentially charged equipment. This is especially significant when the equipment can be covered in coatings, product deposits or rust that is capable of preventing the clamp from making low resistance electrical contact with the equipment to be grounded.





Assembly operators tasked with earthing mobile equipment can install the surface mount connector to ensure a positive contact with the process equipment to be grounded.

A dedicated earthing point on site allows the easy-to-use screw thread connector. The ‘plug and play’ connector can interface with all Newson Gale dual core systems to provide earth monitoring capability on a wide range of mobile processes and equipment where generic earthing clamps cannot be used.

The conical shape design aids in the reduction of powder deposit build up over time and aids in clean down operations.

The static grounding connector is approved and certified to ensure it is capable of dissipating static charges from potentially charged equipment.

Dual Core CLAMPS

Passive vs active grounding

Simple passive grounding has been used throughout industry as a low-cost safety measure and protection against fires and explosions caused by static electricity but is it as safe as you think?

Passive Grounding

Passive grounding clamps and cables are suitable if the metallic object to be grounded has a bright clean surface. This allows even a poorly designed passive grounding clamp to make a low resistance connection to the metal object.

However, not every industrial environment can use a bright clean metal surface, as mild steel usually needs painting to prevent rust and corrosion. This is clearly a physical barrier between the metal surface and the passive grounding clamp.

Paint is the number one enemy of successful and reliable passive grounding. The other main enemy is the product itself causing a barrier between the metal and the clamp with passive grounding, even bright clean stainless steel can be affected by product coatings.





Active Grounding

So, what is the alternative to passive grounding clamps and cables? Well, it is active grounding clamps and cables. When you use passive grounding clamps how do you know that you have made a good low resistance connection to the metal object and the local site ground point? You do not, you just cross your fingers!

Active grounding clamps contain intrinsically safe circuits that measure the resistance from between the teeth of the clamp and the local site ground point to less than 10 Ohms.

This metal-to-metal resistance level of less than 10 Ohms is enshrined in International Standards, Guidance and/or Recommended Practices (IEC TS 60079-32-1, NFPA 77 and API RP 2003).

This less than 10 Ohms connection with an active grounding clamp is confirmed to the user by a high intensity flashing green LED. So use of active grounding clamps and cables, takes the guess work out of safety, allowing you to uncross your fingers and most importantly be safe.

Bond-Rite® Range

Self testing clamps with visual indication and monitoring

The **Bond-Rite**® range provides a “middle ground” between earthing systems and basic clamps.

Bond-Rite provides operators with a 10 Ohms (or less), connection to a verified earth*. This 10 Ohm (or less) connection is indicated via a continuously flashing green LED indicator. Equipment specifiers have the option of specifying an LED indicator mounted earthing clamp or utilising a wall mounted indicator station. All Bond-Rites continuously monitor the resistance between the object requiring static earthing protection and the site verified earth for the duration of the operation.

**Bond-Rite EZ can be used to bond or ground metal items.*

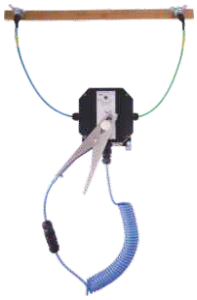
ATEX IECEx





Bond-Rite® CLAMP

Self-testing earthing clamp with visual indication



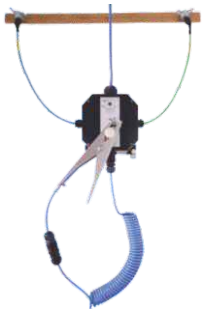
Bond-Rite® REMOTE

Self-testing earthing clamp with mounted monitoring module



Bond-Rite® EZ

Self-testing earthing clamps with visual indication



Bond-Rite® REMOTE (EP)

Externally powered self-testing earthing clamp

If you want to discuss a particular application or product feel free to

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Full details are also provided on the back cover.

Grounding and bonding drums and containers with visual indication

A static grounding system with visual indication is the best solution for simple day to day manufacturing processes where there isn't interlocking capability.

Operators are unable to confirm a good earth connection before the process begins if using a simple grounding clamp and cable assembly.

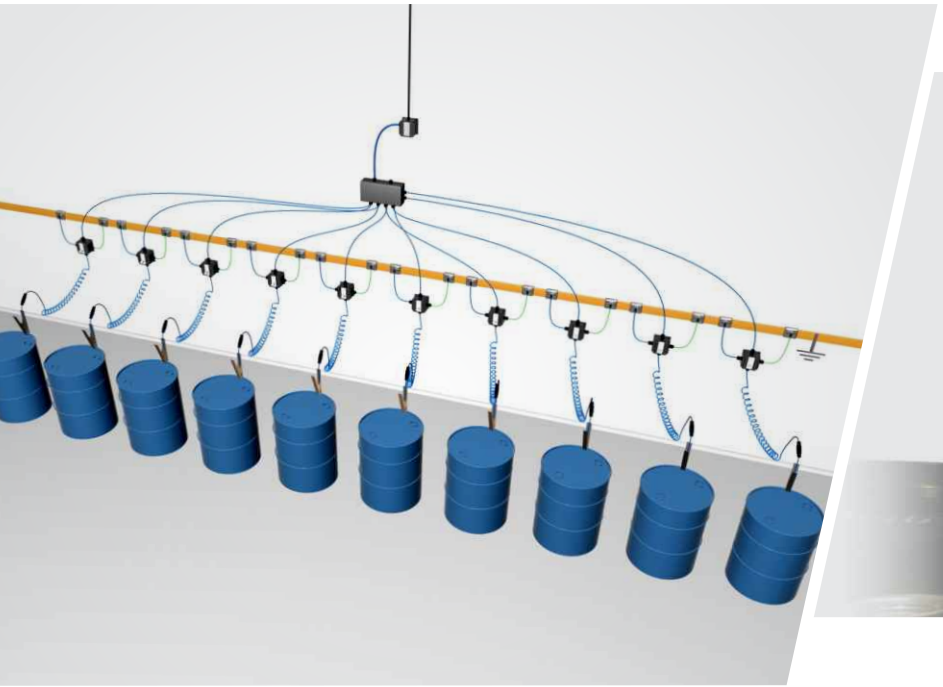
Grounding systems with visual indication (high intensity flashing Green LED) are intrinsically safe (Ex ia) and monitor the resistance between the metallic object that they are attached to and the true earth ground connection (or they can bond metal plant items together such as drums, IBCs or tank trucks).

This flashing green LED provides the operator and their colleagues with confidence that the process is reliably grounded and continuously monitored to 10 Ohms (or less) before the process starts.

Bond-Rite REMOTEs with visual indication can be battery or mains powered depending on the duration of use each day (<6 hours battery OR >6 hours mains powered).

The visual indication can be hand-held or wall-mounted, the clamp is normally made from stainless steel and the wall mounted version from either GRP or stainless steel to suit the process.

Bond-Rites can be used with retractable cable lengths from 3 m up to 30 m to suit the process and application.





IEC TS 60079-32-1, 13.3.1.4 “Movable metal items” states:

Portable conductive items (e.g. trolleys equipped with conductive rollers, metal buckets etc.) are earthed through their contact with dissipative or conductive floors.

However, in the presence of contaminants like dirt, or paint on the contact surface of either the floor or the object the leakage resistance to earth may increase to an unacceptable value resulting in possible hazardous electrostatic charge on the object. Where such situations are expected, the object should be earthed by an alternative means (e.g. earthing cable). A connection resistance of 10 Ω between the cable and the item to be earthed is recommended.

NFPA 77, 7.4.1.3.1, “Bonding and Grounding” states:

Where the bonding/grounding system is all metal, resistance in continuous ground paths typically is less than 10 Ohms. Such systems include those having multiple components. Greater resistance usually indicates that the metal path is not continuous, usually because of loose connections or corrosion.

Cen-Stat™ Range

Single core static earthing clamps and cables, personnel safety equipment

The **Cen-Stat**™ range of ATEX and FM approved static earthing clamps are designed to operate in the harshest EX/HAZLOC areas.

The certifications achieved by our Cen-Stat range of clamps and cables benchmark their ability to establish and maintain good electrical contact with equipment requiring static earthing and bonding protection.

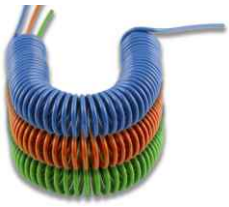
ATEX IECEx FM APPROVED





Static Earthing Clamps

Static earthing clamps



Cen-Stat™ Cable

Hytrel® anti-static coated cable



Static Earthing Reels

Static earthing retractable cable reels

Testers



Sole-Mate™ II

Static Dissipative Footwear Test Station



Personnel Grounding Strap

Personnel Grounding

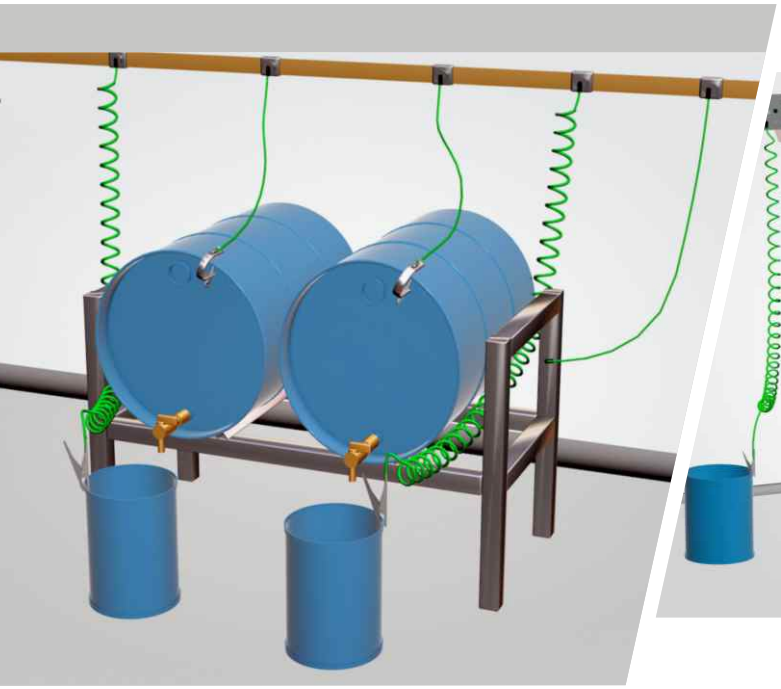
Grounding drums and containers

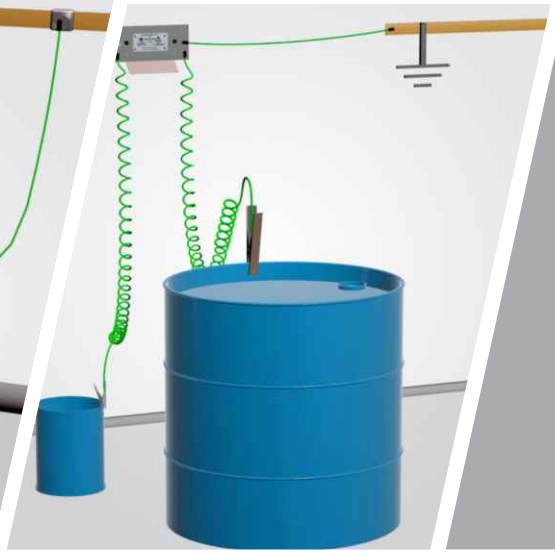
If sites determine that ground monitoring status capability is not a requirement, basic grounding clamps with cables or cable reels can be specified.

Wherever the object requiring grounding is covered in product deposits or coated surfaces it is important to ensure the clamp teeth have penetrated to the base metal of the object. In addition cables should have a high mechanical strength to provide a reliable and repeatable connection.

Electrical continuity checks should be performed on a routine basis to check for wear and corrosion of metal parts and connections.

Factory Mutual tested grounding clamps can be specified in such situations. It is the ultimate responsibility of the end-user / site operator to ensure that solid and stable connections to the object(s) requiring grounding or bonding are made.





If you want to discuss a particular application or product feel free to

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Full details are also provided on the back cover.

Both IEC TS 60079-32-1, 13.4.1 and NFPA 77, 7.4.1.6 & 7.4.1.4 state:

Temporary connections can be made using bolts, pressure-type earth (ground) clamps, or other special clamps. Pressure-type clamps should have sufficient pressure to penetrate any protective coating, rust, or spilled material to ensure contact with the base metal with an interface resistance of less than 10 Ω*.

Where wire conductors are used, the minimum size of the bonding or earthing wire is dictated by mechanical strength, not by its current-carrying capacity. Stranded or braided wires should be used for bonding wires that will be connected and disconnected frequently.

Personnel grounding with grounding straps

The operating requirements of certain processes can cause the loss of direct contact between the operator's static dissipative safety shoes and the static dissipative flooring of the plant or facility.

For example, an operator may need to stand on a ladder to tip powder into a large mixer and in the process of moving to the ladder loses contact with the static dissipative flooring of the plant.

Under limited and controlled circumstances personnel grounding straps may be used.

It should be noted that grounding straps are not a substitute for static dissipative flooring or static dissipative footwear.

Grounding straps should only be used for rare occasions where process operators may lose contact between the soles of their static dissipative footwear and the plant floor.





IEC TS 60079-32-1, 11.4 "Supplementary devices for earthing of people" states:

The simplest type of commercial device is an earthing bracelet with a built-in resistor typically giving a resistance to ground of about 100 kΩ for shock protection. Wrist straps of this type have the greatest utility at ventilation hoods and at other locations where limitation on the operator's mobility can be tolerated. Breakaway wrist tether systems could be necessary where emergency egress is needed. A hood can be equipped with two external coiled earthing cords with cuff attachments that can be removed and kept by individual users.

NFPA 77 , 8.2.3.2 "Personnel Grounding Devices" states:

Supplementary devices should be selected so that accumulation of hazardous static electrical charge is prevented, while the risk of electrocution is not increased. In most practical situations, grounding of personnel is achieved by ensuring that the resistance from the skin to ground is approximately 10^8 Ohms or less. The need to protect against electrocution via a grounding device imposes a minimum resistance from skin to ground of 10^6 Ohms. Based on skin contact and contact with the floor, especially during activities where the entire sole of the footwear is not in contact with the floor (e.g. kneeling) effectiveness can be compromised.

Personnel Grounding Strap

Personnel footwear tester with visual indication

Relevant International Footwear Standards:

BS EN ISO 20345 (Section: 6.2.2.2)

ISO TS 60079-32-1 (Section: 11.3)

NFPA77 (Section: 8.2.2.2)

ASTM F2413-18

CSA Z195-14

Please always check to make sure that you have the very latest version of these standards.

Most of these Safety Footwear Standards , specify a resistance range of 1 x 10^6 Ohms up to 1 x 10^8 Ohms or 1 x 10^9 Ohms.

When specifying footwear testers it is important to know what standard and resistance levels the shoes are manufactured to so that they can tested every time they enter into an Ex/Hazloc area.

Footwear testers need to be used in accordance with the manufacturer's instructions, installed indoors in a safe area, for testing before entering the hazardous zone.

They are not designed to ensure 100% compliance with the relevant footwear standards. They can only indicate if the electrical resistance through the shoes are below the maximum permitted resistance outlined in the relevant standard/s.

It is the site operator's responsibility to ensure adequate levels of training are in place to ensure people use such testers correctly and Standard Operating Procedures (SOPs) are in place so that shoes not in the specified range do not get used in the zoned or classified area.





IEC TS 60079-32-1, 11.3 "Dissipative and conductive footwear" states:

Resistances can be measured with commercially available footwear conductivity testers which measure the resistance between a hand-held metal bar via body and feet to a metal plate on which the person stands. Alternatively, the resistance between a shoe filled with shot pellets and a steel plate on which the shoe is pressed can be measured according to IEC 61340-4-3.

The resistance of footwear can increase with the accumulation of debris on the footwear, use of orthopaedic insoles, and reduced floor contact area. The conductivity of footwear should be tested frequently to confirm functionality.

NFPA 77, 8.2.2.2
"Conductive and Static Dissipative Flooring and Footwear" states:

Static dissipative (SD) footwear used in conjunction with conductive or static dissipative flooring provides a means to control and dissipate static electric charges from the human body. Resistance to earth through static dissipative footwear and conductive or static dissipative flooring should be between 10^6 Ohms and 10^8 Ohms. For materials with very low ignition energies, the resistance to earth through footwear and flooring should be less than 10^6 Ohms. Resistance should be measured with commercially available footwear conductivity testers.

On-going maintenance of static control procedures and equipment

Once appropriate static control procedures and equipment have been put in place, it is vital that a high level of static awareness is maintained. The three principles of a successful, on-going static control policy are:

I. Regular testing of the equipment used including logging of results.
ii. Frequent awareness training for operators and staff, particularly new employees.
iii. Reference to the standards when changes take place, such as the introduction of new types of plant or materials.

Generally, there are two main elements to the physical side of the static grounding system. These are firstly, the fixed grounding network. This may take the form of a copper strip or bar running along the walls and connected to a number of grounding rods, pits or grids, driven into the ground. This network should be tested periodically, with respect to ground, to ensure that it is maintaining a low (typically less than 10 Ohm) resistance to ground. These tests are fairly specialist, and may be carried out by an outside contractor, often in conjunction with tests on lightning protection equipment.

A typical test period would be every 11 or 13 months (so that over a period of time, the tests cycle through the seasons). A main point to look out for when testing the network, is any significant variation with previous tests, which could show deterioration.



Source: K, A., 2006. Ground (electricity) - March 2006 [Online] San Francisco: Wikimedia Foundation. Available from: https://commons.wikimedia.org/wiki/File:HomeEarthRodAustralia1.jpg

This also highlights the need for keeping good records. If the grounding network meets the necessary low resistance, then any metal object connected to it will also be grounded.

The second part of the physical system is the devices used to connect plant and equipment to the grounding network. If a piece of plant is fixed, such as the body of a mixing machine, then a simple strong bonding cable can be used to permanently attach it to the grounding network. However, movable plant, such as the mixer's product bowl, or a 208 litre (55 gallon) drum is harder to ground, and the standards recommend that a cable with strong mechanical strength and a “designed for purpose” clamp are used to make a temporary connection when the item is in use.

These connections can be tested using an intrinsically safe ground lead tester or Ohm meter and the results for each lead recorded. The tester or meter will be used to complete a circuit between the grounding point and the plant item to be grounded; for the purpose of testing clamps and their cables or reels, this may take the form of a clean piece of metal placed in the clamp jaw. The tester or meter leads may then be connected between the piece of metal and the grounding point in order to complete the circuit and obtain a reading.

These types of flexible connector should be tested more frequently than fixed ones; typically once every three months in the case of ground leads and after every re-assembly, in the case of bonds on removable ducting sections. A bond to a fixed piece of plant may be tested on an annual or six-monthly basis.

The on-going training of personnel may be more difficult to maintain, partly because of disruption to production, and also, as it can be difficult to keep things interesting. Training today need not just take the form of a classroom lecture; new interactive learning provides flexible training solutions to accommodate the varying needs of production schedules, shifts and locations. Team leaders can quickly assess the knowledge level of existing or new operators and programme one or two hours per week to bring knowledge levels up.

Today, it is common for companies to use continuous monitoring of ground connections and systems incorporating interlocks that mitigate a static-generating operation from taking place unless the ground is made. Such systems mean that the frequency of lead testing can be reduced, as the systems are providing a continuous test to a pre-determined resistance level. They also mean that the grounding measures are more likely to be remembered during operation, as a visual indication of ground condition, such as the LED in a self-testing clamp, can be incorporated into the company Standard Operating Procedures (SOP).

Equipment commissioning and maintenance service

Our equipment commissioning and maintenance service ensures your Newson Gale static grounding and bonding equipment is installed and maintained in accordance with our system operating and installation requirements.

Our CompEx® certfied engineers will ensure your Newson Gale equipment is installed and maintained in accordance with the equipment's instruction manual.

This is critical to ensuring the equipment has been installed in accordance with the ATEX and IECEx requirements laid down in EN and IEC standards for the safe installation and operation of electrical equipment in EX zoned areas.

In addition to ensuring the equipment is installed in accordance to ATEX / IECEx standards, our engineers will test the functionality of the installed equipment to ensure they are performing at the benchmarked parameters reflected in international guidelines including IEC TS 60079-32-1: "Electrostatic Hazards - Guidance".



Our CompEx certified engineers commission and service all Newson Gale static grounding and bonding equipment installed at your site.

Safety-Checklist

** This is not an exhaustive list. Local requirements need to be fully assessed by responsible managers.*

Maximise Safety in the Area

> Ensure all operators and managers are trained in safe working with flammable products. It is vital that they understand the characteristics and dangers of flammable products and the principles of static control.
> Ensure all electrical equipment is appropriate for use in the designated flammable atmosphere.
> Ensure lift trucks and other vehicles used in the vicinity are explosion protected to the appropriate standard.
> Ensure **"No Smoking"**, **"Static Hazard"** and **"Ex"** warning signs are clearly posted.

Maintain Safe Working Practices

> Ensure all new operators, managers and maintenance staff are trained in safe working with flammable products.
> Develop a written "safe system of working" for the handling of flammable products.
> Ensure all grounding straps, clamps, wires and monitoring systems are regularly inspected and maintained. The results of inspections should be recorded. Intrinsically safe equipment should be used to test continuity.
> Ensure static-dissipative floors remain non-insulating.
> Ensure all contractors are controlled by strict "permit-to-work" systems.
> Where large, conductive, movable equipment, such as stainless steel IBCs, road tankers or "Type C" FIBCs could become isolated from ground, the use of ground monitoring systems, with suitable interlocks to process equipment, pumps or valves is recommended, to ensure that they cannot pose a static hazard.

Minimise Charge Generation and Accumulation

> Ensure operators are supplied with static-dissipative footwear. Gloves, if worn, should also be static-dissipative.
> Ensure floors are adequately conductive and are well grounded.
> Ensure static-dissipative footwear is always worn and remains in good condition by use of resistance testing before entry into the combustible area.
> Ensure all containers, pipework, hoses, plant, etc., are conductive or static-dissipative, bonded together and grounded.
> Ensure that sufficient, suitable grounding leads and clamps are provided to enable movable containers to be grounded prior to product transfer or mixing.
> Where practical, pipe liquids directly from storage to the point of use.
> Mitigate or minimise product free-fall distances.
> Where practical, keep pumping speeds low.
> When using plastic materials, such as drums, kegs, liners and hoses in combustible areas, they should be static-dissipative and suitably grounded.
> When using FIBCs bags in combustible areas or with potentially combustible dusts or powders, they should be "Type C" static-dissipative and suitably grounded.
> The use of anti-static additives should be considered in low conductivity liquids if they do not harm the product.

Timeline...

1982

Cenelectrex

The electrostatic control business of 'Cenelectrex' was setup in 1982 and in 1988 Ernest Kochmann acquired the business.

1988

Rebranded

Cenelectrex was re-branded as Newson Gale.

Relocated

Newson Gale relocated to larger premises in Colwick industrial estate in Nottingham.

2001

Bond-Rite®

Newson Gale released their first patented product – the Bond-Rite® intrinsically safe self-testing clamp.

2005

Newson Gale Inc Formed

Graham Tyers, President – C.E.O. moved to North America and formed Newson Gale Inc. in the light of increased focus on overseas sales.

The Queens Award for Enterprise

Newson Gale was awarded 'The Queens Award for Enterprise' in the International Trade category as a result of increasing overseas sales by 70% in just three years.

2008

Newson Gale Relocated

Newson Gale Ltd moved to its present location at Omega House in Colwick, Nottingham.

2009

Earth-Rite® II

Earth-Rite® II RTR, Earth-Rite® II PLUS, Earth-Rite® II FIBC and Earth-Rite® II MGV released.

2012

Earth-Rite® II MGV

The Earth-Rite® II MGV (Mobile Ground Verification) system won the Technical Innovation award at the International HazardEx Awards ceremony.

2016

Hoerbiger Group

Newson Gale became a member of the Hoerbiger Safety Solutions Group.

Earth-Rite® MULTIPOINT II

Earth-Rite® MULTIPOINT II released.

2017

Newson Gale Inc

Newson Gale Inc in Jackson, New Jersey merged with IEP Technologies LLC based in Marlborough, Massachusetts bringing together the U.S. Hoerbiger Safety Division in one central operation.

2018

Newson Gale GmbH

Newson Gale GmbH relocated from their offices in Essen, Germany to IEP Techologies GmbH in Ratingen to form part of Hoerbiger's Safety Division, Hoerbiger Safety Solutions Group.

2020

Newson Gale China

Employees working for Newson Gale in China merged with Hoerbiger (Shanghai) Co Ltd bringing together the resources and safety under one roof.

Newson Gale
HOERBIGER Safety Solutions

40 Years of saving peoples lives, plant and equipment from the hazards of static electricity.

40 years' experience in the mitigation of uncontrolled static discharge; specialising in the design, development and manufacture of hazardous location static grounding systems, devices and accessories.

Head office and manufacturing facility based in Nottingham, UK, with subsidiaries in USA, Germany, Singapore and China.

A network of channel partners in 53 countries and products shipped worldwide to over 100 countries.

Together We Save Lives

Newson Gale
HOERBIGER Safety Solutions

Static electricity is an ever-present and significant hazard for operations taking place in flammable, combustible or potentially explosive atmospheres. The uncontrolled build up and discharge of electrostatic charge must be avoided in these environments to protect people, plant, processes and the environment.

Newson Gale's wide range of static grounding solutions can control and mitigate these risks, creating a safer and more productive working environment.

www.newson-gale.com



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