



STATIC ELECTRICITY AND ATEX / DSEAR

Datasheet

In June 2003, it became a legal requirement throughout Europe that new and modified plant must comply with the requirements of the European Directive ATEX 137, which in the U.K. is implemented as part of the DSEAR 2002 regulations. Existing plant has until the summer of 2006 to comply. Of all possible sources of ignition that must be considered under this legislation, the ATEX Directive draws explicit attention to only one – STATIC ELECTRICITY.

WHAT'S NEW ABOUT ATEX/DSEAR?

Health and Safety legislation, requiring that employers provide a safe working environment, has been around for a long time. In the past, just how that was to be achieved was largely up to the employer.

Now, where flammable materials that *could* form an explosive atmosphere are being handled, ATEX and DSEAR set out a mechanism for minimising the risks, and employers have a legal obligation to use it. Not only must they use it, but they must be seen to use it – preparation and maintenance of documentary evidence is part of the legal obligation of ATEX and DSEAR.

STATIC AND ATEX/DSEAR

ATEX/DSEAR have a basic three-step approach to minimising risks from flammable atmospheres:

- i) Identify where and when flammable atmospheres could occur, and then devise ways of ensuring that they cannot.

If guaranteeing avoidance of flammable atmospheres is impossible...

- ii) Ensure that nothing could ignite the flammable atmosphere(s).

All possible ignition sources must be considered, but ATEX/DSEAR explicitly and uniquely cautions that static electricity *must* be included in the assessment.

If it is not possible to guarantee the avoidance of all ignition sources...

- iii) Measures must be implemented to control and minimise the effects of any explosion that could occur, in order to ensure the safety of workers and others who have a right to be in the vicinity.

WHY STATIC?

Static is a common cause of fires and explosions, although statistically it is not the most common cause. Indeed, there are many possible sources of ignition, so why should static electricity be singled out for explicit reference?

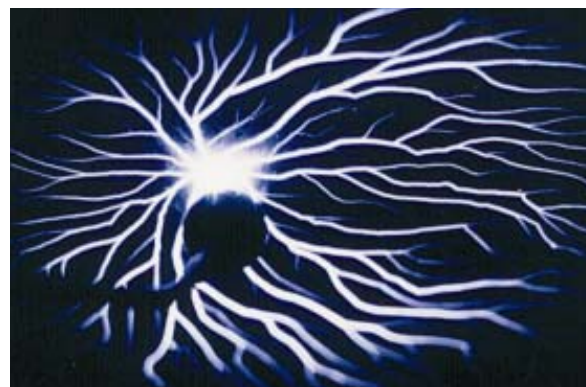
Static electricity is present in a very wide range of industries. In some cases it is an inevitable outcome of the process being carried out. In others, unless specific

measures have been taken, it may occur as a result of secondary actions such as movement of equipment and personnel.

Very few engineers receive any training in static electricity and the hazards associated with it. For many, static electricity elicits only vague memories from school physics laboratories, and annoyance at the small shocks when getting out of a car and moving around places such as department stores.

What is not always appreciated is that just because no shocks are felt, it does not mean there is no static charge. Furthermore, many common flammable atmospheres can be ignited with static discharges (spark-like events) that have an energy that is below the normal threshold of human perception.

In summary, static is almost ubiquitous, its presence is often not appreciated, and its power to ignite flammable atmospheres is often not understood.



ASSESSMENT AND CONTROL OF STATIC HAZARDS

Static hazards must be assessed in a systematic way:

- i) Identify all possible flammable atmospheres and establish the energy required to ignite them. For many gases, liquids and vapours this may be available from literature, however, for all powders it will be necessary to test samples of the actual material being handled.
- ii) Identify those places where static charge could be generated and where static charge could accumulate.

- iii) Where static charge is generated and allowed to accumulate, sooner or later there will be an electrostatic discharge. The next stage of the assessment is to quantify the energy of discharges that could occur.
- iv) The final part of a static hazard assessment is to compare the magnitudes of the ignition energy for the previously identified flammable atmosphere(s), and the possible discharge energy due to the identified static charge. If the discharge energy is greater than the ignition energy, there is a definite static hazard that must be addressed.

AVOIDANCE OF STATIC HAZARDS

Static hazards are dealt with by avoiding charge generation, preventing charge accumulation, or by removing the charge before there is any possibility of a discharge.

Avoiding charge generation is likely to require altering the process in some way. In many cases a small change in temperature or humidity may be all that is necessary. In others the process will be so rigidly fixed that such changes will not be feasible.

Prevention of charge accumulation is often achieved by ensuring all conducting items (including personnel, portable equipment and fixed plant) are properly earthed. However, this has no effect on insulating equipment and materials. It is also often not appreciated that connecting metal plant to earth may have no effect on the materials being handled inside the plant.

In some situations there will be no alternative but to accept that charge will be generated and begin to accumulate. One way forward then is to neutralise the charge before it becomes a hazard, using devices known as static eliminators.

If none of these approaches are possible or practical, it will be necessary to either remove the risk of a flammable atmosphere by inert gas blanketing, or ensure that in the event of an ignition the ensuing explosion is safely controlled or contained.

HOW CAN CHILWORTH TECHNOLOGY HELP?

Although the above procedures can be undertaken and documented in-house, many companies lack the experience or specialised knowledge to undertake these tasks alone.

Chilworth Technology has been carrying out all of the work described above for many years – long before ATEX and DSEAR provided the explicit legal obligation. Chilworth Technology's specialists have considerable experience in the methodology now expounded by ATEX / DSEAR. They can undertake explosion hazard and static hazard assessments and provide recommendations for minimising such hazards. Chilworth's GLP compliant Process Safety Laboratories can also provide material test data if it is not already available.

faxback

Please faxback to Marketing on +44 (0)23 8076 7866

Name:..... Job Title:.....

Company Name:.....

Address:

..... Postcode:..... Country:.....

Telephone: Fax:.....

Email:

My particular interests are:-

Electrostatic Hazards / Problems Hazardous Area Classification.....

ATEX / DSEAR Audits Dust/Gas/Vapour Explosion Hazards.....

Chemical Reaction Hazards..... Incident Investigation / Expert Witness

Training

I would like a free talk with a consultant about a process safety matter.....

I would like a free visit from a consultant next time one is in my area.....

For further information phone Chilworth Technology on +44 (0)23 8076 0722

Chilworth Technology Ltd., Beta House, Chilworth Science Park, Southampton SO16 7NS UK