

Keeping ATEX simple in Dust Extraction

For those involved in dust extraction it would probably be fair to say the harmonisation of *Atmosphere Explosive* or ATEX European regulations into UK law has left many confused. For some, the sight of dust seems to constitute an immediate explosion risk

The first point is that there are no ATEX regulations in the UK. There are two European Directives under ATEX which have been incorporated into existing UK legislation.

ATEX 137 is the Workplace Directive and this has been integrated into the Dangerous Substances and Explosive Atmosphere Regulations, 2002, known as DSEAR. These regulations are to protect workers in their working environment and are the **responsibility of the employer**.

ATEX 95 is the Equipment Directive which has been incorporated into the existing Equipment and Protective Systems Regulations, 1996, referred to as EPS. These regulations cover the design of equipment to prevent ignition sources when used in an *explosive atmosphere* and are the **responsibility of the equipment supplier**.

Both regulations have been in place for some time and used to identify explosive atmospheres created by gas or fume in terms of zoning and electrical equipment standards.

In many production environments some dust is almost inevitable and easy to err on caution. Therefore it is important to have a clear understanding of an *explosive atmosphere* involving dust and is defined in ATEX 137 Workplace Directive *as an explosive atmosphere in the form of a cloud of combustible dust in a concentration above the lower explosive limit*. In most cases product COSHH reports should identify the combustibility of a dust and the risk assessments described below will put parameters on the concentration. must be carried out by the employer. Under DSEAR the simplest visual workplace risk assessment would identify dust either already in a cloud or likely to create a cloud as the basis of designating any "ATEX zones". Ccareful reading of the regulations is important as casual interpretation can lead to over zealous zoning as easily as ignoring the risk.

In a zone 20 the *explosive atmosphere* as described above is present continuously.

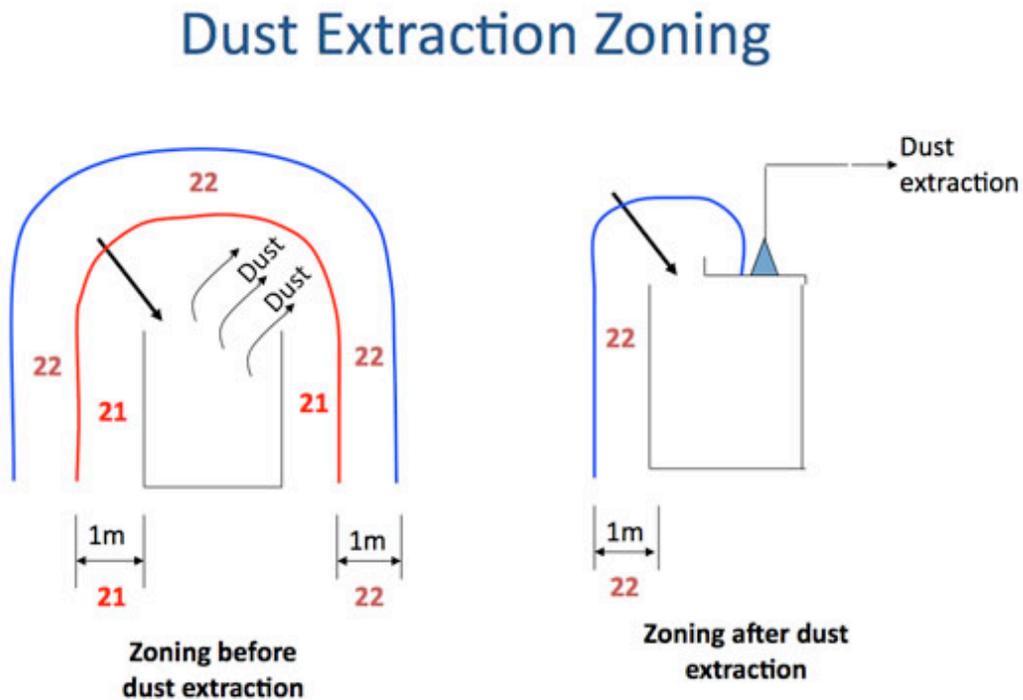
In a zone 21 the *explosive atmosphere* is likely to occur in normal operation occasionally.

In a zone 22 the *explosive atmosphere* is not likely to occur in normal operation and will be for a short period if it does.

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So, if there is a visual dust cloud or settled dust deposits there is likely to be a risk. Reducing that risk by enclosing more of the process or operating under a negative pressure are obvious ways to reduce the risk and probably lessen the zoning designation. Good housekeeping and ventilation may also reduce if not resolve the problem.

Diagram 1. Dust extraction zoning

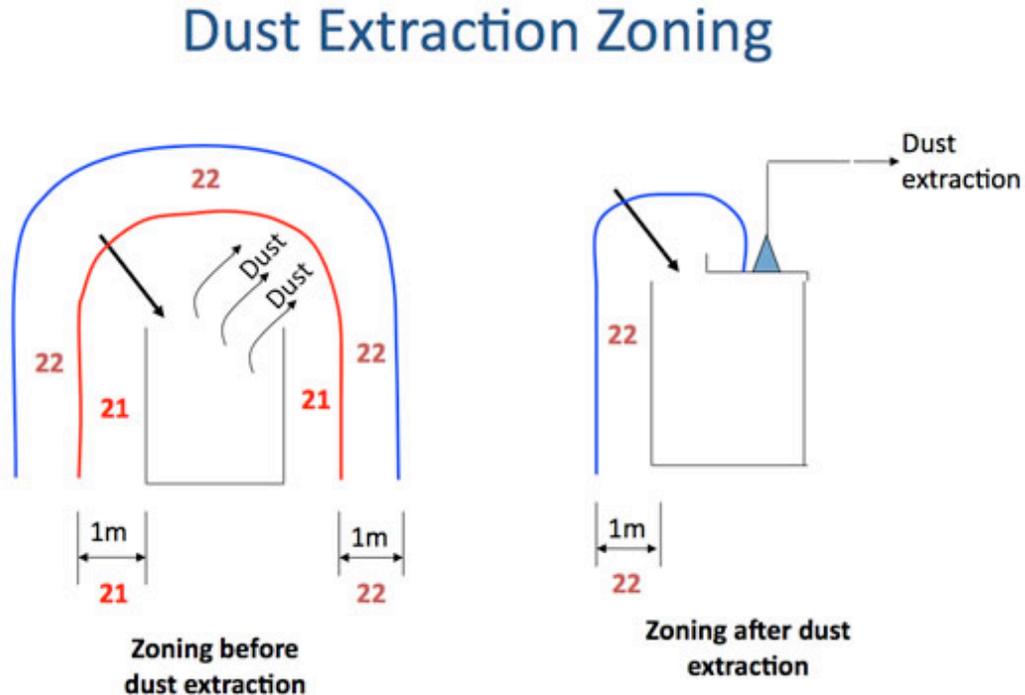


Once a zone has been designated then any equipment installed within the zoned area must comply with the EPS regulations by not creating an ignition source. Predominantly this means the using the correct standard of electrical equipment which will to varying degrees be non-sparking and ensuring that hot surfaces are prevented.

Standards for electrical equipment are well established and if any dust filter or fan is installed inside a designated zone then it too must carry the correct labelling relating to the electrical components. However, if the dust filter and fan are installed outside of any zone in a safe area then the equipment should simply be fit for purpose as it was prior to the incorporation of the directives. This will principally mean it includes a suitable means of containing or safely relieving the internal pressure created in the event of an explosion within. However, as the

diagram below shows, there may be inherent risks in the plant application which create zoning which in turn means localised equipment may need to be certified.

Diagram 2. Dust extraction plant zoning



In the opinion of the writer too much hype has been placed on what is going on inside equipment such as a dust filter, fan or rotary valve. It is not an intention of these regulations to take a quantum step from previous approaches. In fact, in reference to existing equipment it is stated that the equipment should have been a safe product when first supplied, have been and still be fit-for-purpose, and if a safe product prior to the regulations will still be a safe product. Inside any reverse jet dust filter a dust cloud will be created during the cleaning cycle and so anti-static filter bags and the avoidance of electrical equipment are the norm as are explosion relief panels. In the “cleaned air” section after the filter bags and normally into the extraction fan a prudent approach is appropriate although it would need a catastrophic bag failure in most installations to create a dust concentration of sufficient quantity. A rough guide to the lower explosive limit is 30g/m³. However, a simple calculation of the collected dust quantity and the extraction volume would in the majority of cases show a concentration well below.

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With a reasonable degree of understanding (HSE FAQ sheets and the EU Commission's Guide of Good Practice are useful) and a common sense approach ATEX can be managed fairly simply. There are always ready to help however, dust extraction is best left to the experts.