

# ATEX - DMN dust up

*For users of equipment in hazardous dust or gaseous environments, the clock is ticking. Another ATEX deadline aimed specifically at the users rather than suppliers of equipment is approaching, with the aim of improving protection for employees*

By 1 July 2006 all users of electrical and mechanical equipment supplied before 1 July 2003 must have reviewed their processes and carried out risk assessments according to ATEX137 Directive 99/92/EC (DSEAR). If this determines that existing equipment is not safe for the classified area, it must be replaced or up-rated in accordance with the ATEX Directives. Of course, the Directive affects not only the electrical specification of equipment, but also the mechanical specification, specifically the potential of mechanical parts to create a source of ignition.

Many companies across industry, from equipment suppliers to system designers to end users have been aware of the ATEX Directives and their implications for some time. Under ATEX 95, manufacturers of components, equipment or protective systems in particular, had to achieve ATEX certification for any new equipment supplied for use in a hazardous dust or gaseous environment by 1 July 2003.

As a manufacturer at the forefront of supplying valves for ATEX compliance, for several years DMN has been helping its customers to address the sometimes conflicting requirements of valves that perform reliably with the given product and also comply with the demands of ATEX. In that time, extensive experience of the issues involved has been amassed and an extremely comprehensive range of ATEX compliant valves has been built up.

## COMPREHENSIVE RANGE

DMN is well known for having one of the most comprehensive ranges of rotary valves, diverter

valves and slide valves. As an independent component supplier, unrelated to any other business within the industry, they have been able to work in close collaboration with customers on ATEX. Often these customers are installing systems that can be ground-breaking in terms of ATEX compliance and DMN has developed its products to a point where every valve in the range can now be supplied to an ATEX compliant specification. This includes 13 different ranges of rotary valves and seven different ranges of diverter valves.

## DEGREES OF CERTIFICATION

Many equipment suppliers are now claiming to supply ATEX certified equipment, but to what level? In order to achieve certification for Category 3 (Zone 2 Gas / Zone 22 Dust), all that is required is an internal production control system and self certification. Even for Category 2 (Zone 1 Gas / Zone 21 Dust), a manufacturer can still self certify their equipment provided that a technical file is lodged at a notified body and technical documentation requirements are met.

However, if one considers that the internal chamber of any rotary valve or diverter valve is, by nature, an area where a potentially explosive mix of dust and air can occur frequently, then this implies that Category 1 (Zone 20) will very often apply. ATEX certification for Category 1 requires EC Type Examination and ATEX Quality Assurance Notification conducted by an independent, certified



**ABOVE: consequences of poor filter protection can be severe.**

Notified Body.

DMN can supply valves that are ATEX certified for Category 1, having worked closely and extensively on valve design with their Notified Body.

Furthermore, the range of specifications and rotor designs developed by DMN that are available for Zone 20 internal applications is extensive. The valve performance therefore does not have to be compromised in order to achieve Zone 20 internal ATEX certification.

## EQUIPMENT OR PROTECTIVE SYSTEM

There are two fundamental types of ATEX

**"DMN UK has a comprehensive knowledge and understanding of both the DSEAR regulations and ATEX directive, including their legal requirements. DMN's extensive range of ATEX certified valves, complemented by a wealth of experience in their application, have helped to make the issues of ATEX approval easier for our company to implement with our clients."**  
**Paul Sutcliffe, general manager, Fairport Neu Solutions.**



approval for rotary valves, depending if the valve is simply required to operate safely in a classified area or act as an explosion containment device. In the first case, the valve needs to be ATEX certified to guarantee that it will not present an ignition source, either electrically or mechanically generated that could initiate an explosion in the environment that it is operating. This environment will have been classified as a particular 'Zone' (for example by the user's own risk assessment or by an independent expert), depending on the frequency of presence of a potentially explosive atmosphere and whether it is a dust or gaseous hazard, or both. The exact valve specification will depend on the zone in which it is certified to operate. DMN can supply valves that are ATEX certified for any zone. These valves are known as 'Equipment'.

In the second case, the valve is not only certified as safe to operate within the given zone, but also to act as a safety device in containing an explosion within an area of a system should it occur. Such a valve is known as an 'Autonomous Protective System' (APS), and provided it is controlled correctly, it will stop the flame-front of an explosion and preventing it from spreading any further or setting off a secondary explosion further down the system. Many rotary valves are now being specified for this APS purpose and DMN can supply valves that are ATEX certified as Equipment as well as for APS duty. These valves can also be referred to as 'Explosion Chokes' or 'Flame Blocks'. It should be noted that a rotary valve referred to as 'Explosion Proof' or 'Pressure Shock Resistant' is not necessarily an APS type valve.

Indeed DMN has replaced valves that have been incorrectly specified by other manufacturers or users, where the valve is



**"We specialise in designing and building bulk storage and handling systems. Many of the materials handled are subject to ATEX Explosion Directives. The DMN UK range of ATEX certified valves fully meet these requirements and we are confident to incorporate them in the plants we build."**  
**Alf Croston, managing director, Croston Engineering**

required to operate as an APS but is not of the correct type and does not carry the necessary certification due to confusion over terminology.

**MISCONCEPTION**

It is a commonly held misconception that any rotary valve that is ATEX certified as an APS cannot be fitted with a rotor that features adjustable blades. This is true for some valve manufacturers because their ATEX certification does not cover them for this combination of specifications. However, DMN has worked closely with its Notified Body in order to achieve APS certification for valves fitted with adjustable blade rotors.

By offering adjustable blade rotors in ATEX compliant rotary valves (Equipment and / or APS), DMN can offer its customers numerous advantages such as superior sealing performance, longer service life, ease of maintenance, less down time and lower life costs. These rotors are available at no additional cost compared to a fixed vane rotor.

**DUST CLASSES ST1 AND ST2**

For a rotary valve to act as an Autonomous Protective System, it has to be suitable for choking an explosion. However, different dusts and powders will explode with different degrees of violence. This of course has to be taken into account because a highly explosive dust will explode with greater acceleration of pressure, which is in turn more difficult to

choke. Any dust that explodes with an acceleration of up to and including 200 bar/ms is known as an ST1 dust. The explosion front of this type of dust is relatively easy to stop. However, some dusts will explode with greater acceleration of pressure. A dust that will explode at a rate of 201 to 300 bar/ms is known as an ST2 dust. These more explosive dusts are becoming more common as demand increases for products with very fine particle sizes, for example in the pharmaceutical industry. The specification of rotary valve required to act as an APS for an ST2 dust is more advanced than for an ST1 dust, and it is therefore essential that the dust rating is known when the valve is specified. DMN is unusual in that it can supply valves that are ATEX certified for Autonomous Protective System duty with both ST1 and ST2 rated dusts.

**SMALL COST, BIG BENEFIT**

So all this impressive ATEX compliance must equate to one thing – extra cost. It is true that the initial investment in both time and money is considerable in achieving ATEX compliance to the extensive degree that DMN has undertaken. However the cost per valve to the user is kept low due to the high volume of valves that DMN is now able to produce in its specialist rotary valve plant in Holland and specialist diverter valve plant in Germany. This means that customers are often pleasantly surprised at how little the additional cost for ATEX compliance is compared to a standard, non-certified valve.

For example, a 250 mm DL rotary valve, specifically designed for filter hopper and cyclone discharge, can be supplied as ATEX certified Equipment and Autonomous Protective System, suitable for ST1 and ST2 dusts, Zone 20 internal / Zone 22 external, for around £1100. When compared with the potential cost of an explosion on site and the subsequent investigation determining that the equipment being used was not suitable, the unit price of



**ABOVE: the DMN DL valve APS certified for ST1 & 2 dusts around £1100.**



an ATEX certified valve becomes very easy to justify.

#### IT DOESN'T HAVE TO BE COMPLEX

A great number of equipment users tend to consider the whole ATEX issue as a highly involved field that they would rather avoid for fear of spending endless hours and vast sums of money. This is often compounded by equipment suppliers who hide behind jargon and try to turn ATEX compliance into a black art (often to hide their own lack of understanding). It really doesn't have to be that way. DMN truly understands the issues involved, and is able to relate ATEX to the equipment user's situation and talk in his language about the implications for the valves required, be they rotary, diverter or slide valves. Unlike some suppliers, DMN does not insist that a complex ATEX information form be completed before they quote a valve specification and price. All that is required is the completion of a simple questionnaire when an order is placed. This ensures that all the relevant application information is available and avoids problems with inappropriate certification at a later date.

#### REGULAR SERVICE

Once an ATEX certified valve has been installed into a system, in order to maintain the parameters on which the certification is based, it is important that the valve is serviced regularly. How regularly will depend on the application and the material that the valve is handling. For example it is important that an APS certified valve has the clearances between the valve bore

and rotor blades monitored, so that they do not wear to a point where the valve would no longer arrest an explosion. DMN can help to establish a suitable maintenance regime and carry out inspection and maintenance of the valves to ensure that ATEX certification remains valid and complete.

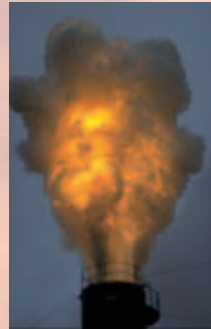
#### BIG INTENTIONS, LITTLE BUDGET?

Whilst many equipment users are now aware of their obligations with regards to ATEX compliance, lack of budget can be a major obstacle to achieving it. It is a misconception that all existing equipment that is not ATEX compliant needs to be replaced in order to achieve ATEX compli-

ance. Indeed, through a risk assessment process, some equipment may be deemed perfectly suitable for continued operation even though it has been on site for many years and has no certification under ATEX at all. However, some existing equipment may well need to be replaced with new, similar equipment that carries the necessary ATEX certification. Or will it? Maybe the valves can be refurbished and up-rated rather than replaced? DMN offers a service

where any DMN valve can be returned to the factory for inspection. If it is viable and cost effective to re-manufacture this existing equipment rather than replace it, this

can provide a highly cost-effective way of achieving the necessary ATEX compliance. Any valves



ABOVE: explosions can be vented to safe areas.



**"DMN UK has an excellent knowledge of the requirements of the ATEX Directives. Their range of ATEX certified valves is extensive and they have approached the subject very professionally on the jobs they have done for us."**  
**Dave Lyons, engineering manager, K-Tron PCS.**

**"When designing your system to comply with the ATEX regulations, it is important to consider using the process equipment and procedures as your first line of defence. For a comprehensive range of ATEX certified Rotary valves at sensible prices, I always recommend DMN in the UK, who can assist you with the selection of the best ATEX compliant solution."**

**Declan Barry, managing director, ATEX Explosion Hazards**

that are re-manufactured to ATEX specification carry exactly the same ATEX certification and manufacturer's warranty as a brand new valve. DMN UK can also visit a customer's site to survey existing equipment to reduce the downtime caused by moving equipment away from site.

DMN UK can arrange for a local representative to discuss any aspects of ATEX or other issues of valve supply. They can also direct interested parties to sources of more general ATEX related information, including 'Practical Guidance for Suppliers and Operators of Solids Handling Equipment for Potentially Explosives Dusts', an upcoming ATEX Guidance Document produced by the Solids Handling and Processing Association (SHAPA) and endorsed by the Health & Safety Executive.

DMN-WESTINGHOUSE has been designing and manufacturing rotary valves, diverter valves and other related components for the bulk solids industry for more than 40 years. Offering tailor made solutions for the mineral, chemical, food, plastics, pharmaceutical and other industries, DMN products are distributed worldwide. Besides an extensive range of standard components, they also supply components conforming to USDA requirements and pressure shock resistant up to 10 bar as well as ATEX compliant to Directive 94/9/EC, including for use with ST2 rated powders.

As a special service DMN UK also offers a refurbishment facility for its valves and can return worn equipment to original manufacture specifications. All refurbished equipment carries the same comprehensive warranty and back up service as the new valves. ●

For more information, contact DMN UK on tel: 01249 818400 or email: [dmn@dmnuk.com](mailto:dmn@dmnuk.com) or visit: [www.dmnwestinghouse.co.uk](http://www.dmnwestinghouse.co.uk)



ABOVE: Plug Diverter Valves (PTD) in production at DMN's dedicated plant.