

# **Mist explosions & DSEAR - the HSE view**

**by**

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# Aims

- 1. To identify the legislation covering Explosive atmospheres involving Mists**
- 2. To discuss requirements of the legislation**
- 3. To highlight by example some of the issues concerning flammable mists**

# European Directives

<b>Directive</b>	<b>Title</b>	<b>Implementation Date</b>
ATEX Equipment Directive (94/9/EC)	<b>Equipment &amp; Protective Systems            Intended for Use in Potentially            Explosive Atmospheres</b>	<b>July 2003            (Voluntary            March 1996)</b>
ATEX User Directive 137 (99/92/EC)	<b>Minimum Requirements for improving            the Safety &amp; Health of Workers            Potentially at Risk from Explosive            Atmospheres</b>	<b>July 2003            (all by July 2006)</b>
Chemical Agents Directive (98/24/EC)	<b>Protection of the Health &amp; Safety of            Workers from the Risks related to            Chemical agents at Work</b>	<b>May 2001            (Actual Dec            2002)</b>

# UK ATEX Related Legislation

- Equipment & Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 – EPS  
*implements: ATEX Equipment Directive (94/9/EC)*
- Dangerous Substances and Explosive Atmospheres Regulations 2002 – DSEAR  
*implements: ATEX User Directive (99/92/EC) & Chemical Agents Directive (98/24/EC)*

# Explosive Atmosphere - Definition

Mixture with air, under atmospheric conditions, of flammable substances in the form of gases, vapours, **mists** or dusts in which after ignition has occurred, combustion spreads to the entire unburned mixture.

ATEX User Directive (99/92/EC) Article 2

DSEAR, Regulation 2

ATEX Equipment Directive (94/9/EC) Chapter 1, Article 1.3

EPS Regulations, Regulation 3(2)(f)

# Requirement for Prevention of and Protection against Explosions

## ATEX User Directive (99/92/EC) Article 3

..... the employer shall take technical and/or organisational measures appropriate to the nature of the operation, **in order of priority** and in accordance with the following basic principles:

- the **prevention** of the formation of explosive atmospheres, or where the nature of the activity does not allow that,
- the **avoidance** of the ignition of explosive atmospheres, and
- the **mitigation** of the detrimental effects of an explosion so as to ensure the health and safety of workers.

# DSEAR 2002

To eliminate or reduce the risks from Dangerous Substances that might harm employees and any other people affected by the work concerned, SFAIRP

- Regulation 5: Risk Assessment
- Regulation 6: Elimination or reduction of risks from Dangerous substances  
[Hierarchy of control measures]
- Regulation 7: Classify places where flammables are used into hazardous and non-hazardous areas

# Elimination or reduction of flammability of mist




Use of Synthetic Hydraulic Fluid in place of Mineral Oil



# Avoiding ignition sources



- Hazardous Area Classification
  - Zones
  - Extent
- Use of correct ATEX certified equipment
  - CE  II 2 G

Additionally

  - Temperature Class the maximum surface temperature (T1 to T6)
  - Ingress Protection (typically IP 54)

# Avoiding adverse conditions

Cleaning spray bar on bitumen road tanker with kerosene



# Mist explosions & DSEAR

## - the HSE view



**Thank you for your attention**