



Fire and Explosion Hazards Services

*Protect your plant from the consequences
of fires and explosions*

Dust explosion hazard testing

Gas and vapour flammability testing

Fire properties and thermal stability testing

Fire and explosion hazard assessments

Hazardous Area Classification services

Incident investigation services

Problem solving and safety system specification

Fire and Explosion Hazards Service

Understanding the Risk



20 Ltr Sphere



Flammable Range Apparatus

Almost every industrial company is involved in the handling of flammable solvents, dusts, gases and thermally unstable substances. Should a fire or explosion occur on your plant, the consequences are likely to be severe and may include:

- Loss of life or serious injury
- Damage to, or destruction of, plant equipment
- Regulatory investigation and litigation
- Bad public perception of the company
- Environmental damage
- Loss of productivity and market share

The introduction of new European directives (ATEX 137 and CAD), specifically targeted at fire and explosion hazards, places an additional regulatory requirement on all companies to characterise and control the hazardous properties of all materials handled.

WHAT SHOULD YOU DO?

The understanding of the hazardous properties of materials under processing conditions is a prerequisite for safety evaluation. Literature values may be available for standard properties of gases and vapours but even these may not be adequate if your processing environment involves elevated temperatures or pressures. For dusts and thermally unstable substances, literature data is unlikely to be available, and, even if it is, it is unlikely to represent the properties of your specific materials or processing conditions.

Operating an industrial facility free from fire and explosion hazards requires a strategic assessment procedure including the following areas:

- Characterise the hazardous properties of all materials used with due regard to the conditions of use
- Conduct a thorough risk assessment to identify hazardous areas and potential ignition sources
- Implement safety systems such that fire and explosion hazards are either eliminated or controlled.

HOW WE CAN HELP

Chilworth Technology provide a one-stop service for all stages of fire and explosion hazard evaluation. Our GLP-compliant laboratories are equipped with a full range of test apparatus for material characterisation. As well as a complete complement of British, European and Internationally recognised standard test methods, we offer a wide-range of tests for the evaluation of parameters under "non-standard" conditions (eg. elevated temperature and pressure). The experience and versatility of our technical staff means that for any given problem, we will endeavour to find the most appropriate and cost effective way of helping you understand the hazards of your specific materials or process. The laboratory facilities are supported by a team of highly experienced process safety specialists who can help our clients interpret and use data effectively in managing fire and explosion hazards.

Fire & Explosion Testing

- **Dust Explosion Flammability Testing**
 - Dust cloud flammability analysis (Group A/B classification)
 - Ignition sensitivity determination (including minimum ignition energy and minimum ignition temperature)
 - Ignition severity determination (20 L sphere, for P_{max} and K_{st})
 - Flammability limits determination (limiting oxygen for combustion and minimum explosible concentration)
 - Particle sizing (using laser diffraction or conventional mechanical sieve methods)
- **Gas and Vapour Flammability Testing**
 - Ignition sensitivity analysis (including autoignition temperature, minimum ignition energy, minimum igniting current, maximum experimental safe gap)
 - Explosion severity (dP/dt_{max}, K_g and P_{max} determination) at ambient and elevated temperatures and pressures
 - Flammable limits determination (flash point, fire point, combustibility testing, flammable range at ambient and elevated temperatures and pressures)
- **Fire Properties Testing**
 - Flammability of solids (burning rate) determination
 - Burning behaviour determination
 - Oxidising properties of liquids and solids
- **Thermal Stability Testing**
 - Layer ignition temperature determination
 - UN standard thermal stability tests (for UN Classes 4.1 and 4.2)
 - Thermal stability testing under enclosed conditions (DSC, Carius tube, ARC, Dewar)
 - Thermal stability under aerated conditions (Diffusion cell, Aerated cell, Air Over Layer, Basket tests)
- **Electrostatic Properties Testing**
 - Resistivity/conductivity (of powders, liquids and surfaces)
 - Charge relaxation time determination (for powders and surfaces)
 - Complete electrostatic testing of FIBC's

We have specialist facilities (on-site) for controlled humidity testing, testing of potential explosives in experimental blast chambers and for testing toxic or highly active substances.

Testing can be performed to GLP protocols if regulatory compliance (or formal quality assurance) is required. In any case, the GLP compliance of all of our Process Safety Laboratories guarantees that the quality, reliability and traceability of your study will be second to none. Few other service providers in this field offer this level of quality assurance, if any.

The Chilworth approach is to provide the most cost-effective and complete service which is tailored to your specific operation. We provide unrivalled customer support. Whether your project involves testing or consultancy, you are guaranteed personal and friendly technical support which will ensure that you gain maximum benefit from your study.



Hot Plate Apparatus

Our team of highly experienced Process Safety Specialists are available to undertake :

- plant safety audits
- electrostatic audits
- hazard assessments
- hazardous area classification
- basis of safety reviews
- explosion protection document preparation (as required by ATEX 137)
- incident investigation
- expert witness services
- technical training on Process Safety

Fire and Explosion Hazards Services

Chilworth
Technology

the experts in process safety

THE BENEFITS

From Chilworth you obtain:-

- Impartial, professional and confidential consultancy advice.
- Access to laboratories which can safely test highly energetic and toxic material.
- Expert guidance on the selection of tests and interpretation of results.
- The availability of experienced process safety specialists to assist with the application of data and hazard assessment on plant
- Testing to British, European, American and International standards.
- Fast and reliable data.
- The confidence of knowing that data comes from GLP compliant laboratories.



Testing to GLP Standard



Consultancy



Training



CHILWORTH SERVICES

We offer a range of testing and consultancy services to the processing industry, covering:-

- Dust/Gas/Vapour Explosions
- Electrostatic Hazards
- Hazardous Area Classification
- Chemical Reaction Hazards
- Emergency Relief Vent Sizing (DIERS)
- Regulatory Testing (NONS, CHIP, CPL, UN)
- ATEX / DSEAR Audits
- Major Hazards (Seveso II / COMAH)
- HAZOP
- Incident Investigation
- Expert Witness
- Safety Training

For further information and a comprehensive list of the testing services available, please contact one of our offices detailed below.

CONTACT

Process safety experts are on hand at the following sites:-

Chilworth Technology Ltd

Beta House, Chilworth Science Park,
Southampton, SO16 7NS, UK

Tel: +44 (0)23 8076 0722

Fax: +44 (0)23 8076 7866

Email: marketing@chilworth.co.uk

Web: www.chilworth.co.uk

USA: Chilworth Technology Inc, New Jersey

Tel: +1 732 274 0900 Email: safety@chilworth.com Web: www.chilworth.com

Italy: Chilworth Vassallo Srl, Valmadrera

Tel: +39 (0)341 200023 Email: info@chilworth.it Web: www.chilworth.it

India: Chilworth Safety & Risk Management (Pvt) Ltd, Mumbai

Tel: +91 (0)22 2655 7969/70/71 Email: info@chilworth.co.in Web: www.chilworth.co.in

For further information telephone +44 (0)23 8076 0722