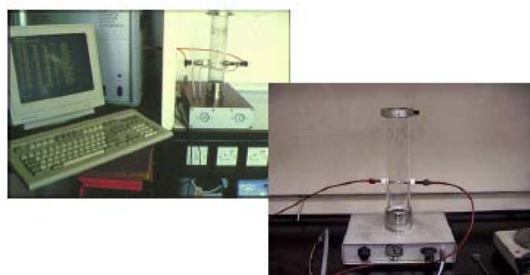




Fire and Explosion Testing Services

Understanding the Problem:

Almost every industrial company handles flammable solvents, dusts, gases and thermally unstable substances presenting a risk of fire and explosion. The consequences of any undesirable event are likely to be severe and may include



Minimum Ignition Energy Apparatus

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

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 and 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. Characterizing the hazardous properties of all materials used with due regard to the conditions of use is an important element of a strategic risk assessment procedure.



20L Sphere

How We Can Help:

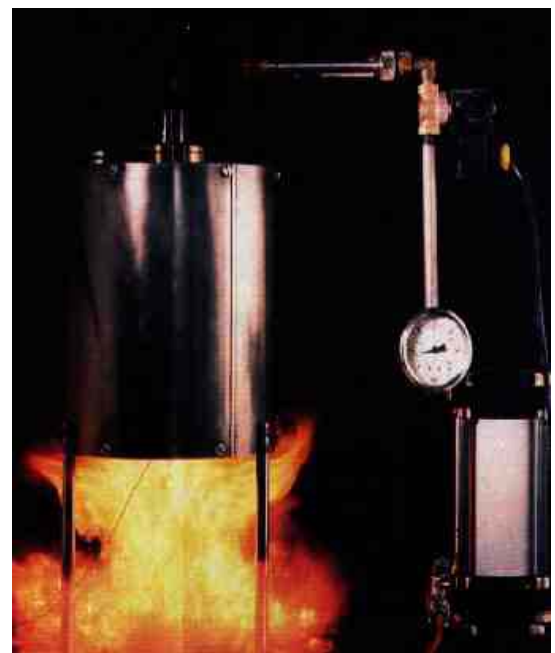
Chilworth Safety & Risk Management provides a one-stop service for all stages of safety and risk management. Our laboratories are equipped with a full range of test apparatus for material characterization. The experience and versatility of our technical staff means that for any given problem, we will endeavor 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 process hazards.

Dust Fires & Explosion Flammability Testing:

- Dust cloud flammability analysis
 - Group A/B Classification
- Ignition sensitivity determination
 - Layer Ignition Temperature
 - Minimum Ignition Temperature
 - Minimum Ignition Energy
- Ignition severity determination
 - 20 L sphere test for Pmax and Kst determination
- Flammability limits determination
 - Limiting Oxygen Concentration
 - Minimum Explosible Concentration
- Flammability of solids (burning rate) determination
- Burning behaviors determination
- Oxidising properties of liquids and solids

Electrostatic Properties Testing:

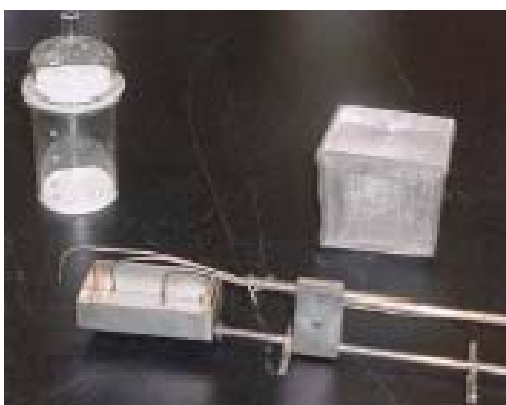
- Electrical conductivity – Liquids
- Electrostatic chargeability test – Powders
- Volume Resistivity & Charge relaxation time Powders
- Surface resistivity and charge relaxation time – Films, Fabrics Coatings
- Complete electrostatic testing of FIBC's



Minimum Ignition Temperature Apparatus

Gas/Vapour Flammability Testing:

- Ignition sensitivity analysis
 - Auto-ignition temperature
 - Minimum Ignition Energy
 - Minimum Igniting Current
 - Maximum Experimental Safe Gap
- Flammable limits determination at ambient and elevated Temp. & Pr.
 - Flash Point
 - Fire Point
 - Flammability range (LFL/ UFL)



Thermal stability under aerated conditions

Chilworth also has the facility to conduct the standard UN Transportation Recommended tests, Basket Tests, required to meet transport of dangerous goods requirements

The Benefits:

From Chilworth you obtain:

- Impartial, professional and confidential consultancy advise
- 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 National and International Standards
- Fast and reliable data
- The confidence of knowing that data comes from ISO/IEC 17025 Accredited Laboratory



FIBC Testing

Thermal Stability Testing:

- Layer Ignition Temperature Test
- UN standard thermal stability tests (for UN Classes 4.1 and 4.2)
- Thermal stability testing under enclosed conditions
 - Differential Screening Calorimetry
 - Carius tube
 - Accelerated Rate Calorimetry
 - Dewar Calorimetry
- Thermal stability under aerated conditions
 - Diffusion Cell Test
 - Aerated Cell Test
 - Air Over Layer Test



Hot Plate Apparatus

The Company:

Chilworth Holdings established in 1986 is an independent firm of scientists and engineers providing services to industry in Process Safety, Electrostatics, Environmental concerns and Energy saving and utilization related issues. With bases in Europe, North America and Asia, Chilworth Group provides a truly global coverage but with a local presence in many regions of the world.

The INDIA base of Chilworth Holdings, **Chilworth Safety & Risk Management (CSRM)** is divided into a number of divisions. The Process Safety Division provides specialist testing services and impartial consultancy advice based on extensive experience throughout the chemical and processing industries. It provides expertise in the assessment of the hazards associated with chemical processing and other process industries.

In order to support this function, extensive laboratory facilities are available to fully quantify the hazards identified and sometimes, for example to conduct highly specialized tests, CSRM makes use of Chilworth Group facilities to provide fast, economical and reliable safety data to the Asian clients.



Chilworth Consultancy Services:

- Electrostatic Ignition Hazards
- Dust Explosion Hazards
- HAZOP/HAZAN/FMEA
- Emergency Relief Design (DIERS methodology)
- Quantitative Risk Analysis
- Hazardous Area Classification
- Incident Investigation
- Runaway Chemical Reactions Hazards
- Behavioral Safety
- Offshore Oil and Gas platform Auditing (OHSE Audit)
- CSICB (Comprehensive Safety Improvement and Capacity Building)
- Comprehensive HSE/Safety Audit
- Environmental and Energy Services

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