



# CHILWORTH TECHNOLOGY SERVICES

Established in 1986 to provide a comprehensive source for process safety advice, Chilworth Technology Ltd is recognised today as a global provider of expert knowledge and quality test data to the process industry. Chilworth Technology Ltd has international consulting bases in the UK, USA, Italy, France and India and laboratories in Southampton, UK and Plainsboro, USA.

## CAPABILITY

Chilworth Technology provides specialist testing services and impartial consultancy advice based on extensive experience throughout the processing industries. It provides expertise in the assessment of all process safety issues.



In addition, Chilworth Technology has a dedicated Electrostatics Division specialising in both electrostatic applications and problems associated with unwanted static charge. It provides the expertise to develop new and existing applications, and to solve processing problems. Specialist testing and measurements are also undertaken, with the client base covering the whole range of manufacturing, process and service industries.

This area has seen rapid growth and Chilworth Technology is now a European focus for both Electrostatics and Technical Safety.

## CLIENT BASE

Chilworth Technology's client base covers over 60 countries and includes national and multi-national manufacturing companies in the general chemical, fine chemicals, pharmaceutical, oil, petrochemical, food, drink, paper & packaging, plastics & rubber, agrochemical, household products and many other industries.

## TECHNICAL STAFF



## CONSULTANCY

Chilworth Technology is a world leader in the field of process safety consultancy. The range of consultancy services that Chilworth provide typically includes:

- Dust / Gas / Vapour Explosions
- Electrostatic Hazards
- Hazardous Area Classification
- Chemical Reaction Hazards
- Chemical Process Optimisation
- Classification, packaging and labelling requirements
- Hazard and risk assessments particularly with regards to ATEX / DSEAR / CAD legislation
- Assistance with safety management documentation including the Explosion Protection Document (EPD)
- Major Hazards (Seveso II / COMAH)
- HAZOP
- IEC 61508/61511 SIL Determination
- Occupied Buildings Assessments
- Incident Investigation / Expert Witness
- Fire Risk Assessments
- Training

The Company employs highly qualified and internationally respected Engineering and Scientific staff. Our senior consultants are internationally recognised experts in their specialist fields. Many have served on national and international standards committees.

*Laboratory services, please see overleaf...*

## LABORATORY SERVICES



Extensive process and material safety testing facilities are available at Chilworth. All laboratory facilities are Good Laboratory Practice (GLP) registered and tests are conducted according to internal Standard Operating Procedures (SOP's). GLP can be applied to any testing program but is a prerequisite for data related to:

- Notification of New Substances (NONS).
- Material Safety Data Sheets (MSDS).
- Data used for classification, packaging and labelling.

All "standard" tests are conducted according to current international standards (eg., EN, IEC BS ASTM, ISO, etc). As well as routine determinations, innovative test solutions can be developed for specific customer applications. Examples are listed below of our capabilities in specific business areas:

### Dust Explosion Testing

- Group A/B Flammability Classification test
- Explosion severity analysis (20 litre sphere) for Kst and Pmax.
- Limiting Oxygen for Combustion in any specified inert atmosphere (LOC)
- Minimum Explosive Concentration (MEC)
- Minimum Ignition Energy (MIE) – using capacitive or inductive sparks
- Minimum (dust cloud) Ignition Temperature (MIT)
- Layer Ignition Temperature (LIT)



### Reaction Calorimetry

- Mettler RC1 reaction calorimeter including:-
  - pressure vessel option (to 10 barg)
  - gas generation measurement
  - mass spectrometry analysis of evolved gases
  - reflux calorimetry capability

### Gas and Vapour Flammability Testing

- Explosion severity analysis (5 litre sphere) for Kg and Pmax (including elevated start temperature and pressure capability)
- Minimum Oxygen for Combustion in any specified inert atmosphere (MOC)
- Lower and upper explosive limit determination (LEL / UEL)
- Minimum Ignition Energy (MIE)
- Auto Ignition Temperature (AIT)
- Flash point (Abel, Pensky Martens and Setaflash methods)

### Runaway Reaction Testing (eg for DIERS Vent Sizing Data)

- Adiabatic Dewar calorimetry including:-
  - Sealed cell calorimetry for kinetic measurement of runaways and advanced thermal stability analysis
  - Tempering trials for venting regime characterisation
  - Blow-down trials for viscosity measurement

### Explosive Properties Testing and Classification

- DSC screening and structural analysis for classification (or exemption)
- Koenen tube and time / pressure determination
- Impact and Friction sensitivity testing
- Effect of fire and thermal stability tests (including Self-Accelerating Decomposition Temperature (SADT) analysis)
- Blast chambers for energetic substances testing

### Thermal Stability Testing

- Differential Scanning Calorimetry (DSC)
- Carius (10 g) tube test
- Accelerating Rate Calorimetry (ARC)
- Adiabatic Dewar test methods
- Specialist tests for powders
- Basket tests for powders

### Electrostatic Properties Testing

- Resistivity / conductivity and charge relaxation time analysis (for liquids and powders)
- Air and humidity controlled laboratory for electrostatic properties testing
- Powder Chargeability pneumatic test equipment
- Test facilities for Flexible Intermediate Bulk Container (FIBC) and IBC electrostatic measurements
- Electrostatics research facility



### Fire Properties Testing

- Burning behaviour and burning rate determination
- Calorific value (heat of combustion) measurement
- Hot spot propagation rate

### Physico-Chemical Properties Testing

- Melting point, boiling point, relative density, surface tension determinations
- Flammability and Vapour pressure determination
- Water solubility and partition coefficient determination by HPLC analysis
- Explosive and Oxidising properties
- UV/Vis Spectrophotometry
- Particle size analysis determination by Malvern MS2000 Laser diffraction analyser (20 nm – 2 mm)
- Collaboration with toxicology and ecotoxicology test facilities to provide complete NONS/ REACH/ GHS data