

ioMOSAIC STATEMENT OF QUALIFICATION

CHEMICAL REACTIVITY AND LARGE SCALE TESTING

OVERVIEW

Safe design of reaction containment and venting systems, depends on a thorough understanding of chemical reactivity hazards and thermokinetics. In some cases, it is necessary to verify the theory through large scale testing.

We can help you manage your reactivity hazards. Our principals "wrote the book" on process safety management, auditing, and chemical reaction safety. In addition, we offer extensive computational and laboratory testing services including:

- ◆ Reaction Calorimetry
 - RC1 (high pressure and low pressure)
 - QRC (Quantitative Reaction Calorimeter)
 - DSC and Dynamic DSC / high pressure
- ◆ Adiabatic Calorimetry
 - ARC
 - APTAC
- ◆ Vent Sizing Calorimetry
 - APTAC
 - RSST
- ◆ Shock Sensitivity
 - Drop weight Test
 - Blasting cap test
- ◆ Flammability (Dust and Gas)
 - 20 Liter sphere for Kst/Kg values
 - Minimum Ignition Energy (MIE)
 - Minimum Ignition Temperature (BAM Oven)
 - Particle size analysis
 - Moisture content analysis
 - Bomb Calorimetry (Heats of combustion)

ANALYTICAL SERVICES

Our Analytical services include state of the art material characterization, thermal analysis, Mass Spec, organic elemental, atomic spectroscopy, X-ray fluorescence, refinery support, distillation, electrochemistry, polymer analysis, X-ray diffraction, structural properties, microscopy, surface analysis, NMR, and optical spectroscopy.



LARGE SCALE TESTING

Our professionals have carried out large-scale hazard tests to verify the magnitude of the hazard in commercial scale systems. For such tests, we develop the test plan, oversee the field testing, interpret the test results, and prepare a summary report. For example, we functioned in this capacity on a series of large-scale propane tank BLEVE tests for NFPA. We also conducted blow-down tests of silane tube trailers, for a group of manufacturers.

SCALE-UP CALCULATIONS

Our software tools are the industry standard for performing reactive system pressure relief design. In July of 2002, the AIChE Design Institute for Emergency Relief Systems Users Group selected our relief design software (SuperChems) as the successor to the SAFIRE computer code. SuperChems Expert has been the subject of many publications and is used successfully by several major chemical companies.

- ARC® is a registered trademark of TIAX LLC
- APTAC™ is a trademark of TIAX LLC
- SuperChems™ is a trademark of ioMosaic Corporation
- RC1™ is a trademark of Mettler Toledo
- RSST™ is a trademark of Fauske & Associates Inc.

About ioMosaic

Founded by former Arthur D. Little Inc. executives and senior staff, ioMosaic Corporation is the leading provider of safety and risk management consulting services. ioMosaic has offices in Salem, New Hampshire and Houston, Texas.

Since the early 1970's, ioMosaic senior staff and consultants have conducted many landmark studies including an audit of the Trans-Alaska pipeline brought about by congressional whistle blowers, investigation of the Bhopal disaster, and the safety of CNG powered vehicles in tunnels. Our senior staff and consultants have authored more than ten industry guidelines and effective practices for managing process safety and chemical reactivity and are recognized industry experts in LNG facility and transportation safety.

ioMosaic Corporation is also the leading provider of pressure relief systems design services and solutions. Its pressure relief system applications are used by over 250 users at the world's largest operating companies. It holds key leadership positions in the process industries' most influential and active pressure relief system design, and chemical reactivity forums, and plays a pivotal role in defining relief system design, selection, and management best practices.

Safety & Risk Management Consulting Services

- ◆ Auditing
- ◆ Calorimetry, Reactivity, and Large-Scale Testing
- ◆ Due Diligence Support
- ◆ Effluent Handling Design
- ◆ Facility Siting
- ◆ Fire and Explosion Dynamics
- ◆ Incident Investigation, Litigation Support, and Expert Witness
- ◆ Liquefied Natural Gas (LNG) Safety
- ◆ Pipeline Safety
- ◆ Pressure Relief Design
- ◆ Process Engineering Design and Support
- ◆ Process Hazards Analysis
- ◆ Process Safety Management
- ◆ Risk Management Program Development
- ◆ Quantitative Risk Assessments (QRAs)
- ◆ Structural Dynamics
- ◆ Training

Software Products:

ioXpressKM (ioXpress Knowledge Manager is a web-based enterprise application for corporate electronic information management).

SuperChems (SuperChems is an advanced tool for pressure relief design, consequence analysis, and thermal hazards assessment).

HAZOPtimizer is a software product for recording and managing process hazard analysis.

Salem Office

93 Stiles Road
Salem, New Hampshire 03079
Tel: 603-893-7009
Fax: 603-251-8384

Houston Office

2650 Fountain View Drive
Suite 410
Houston, Texas 77057
Tel: 713-490-5220
Fax: 832-553-7283

Email: sales@iomosaic.com
Web: www.iomosaic.com