



Fauske & Associates, LLC

Fully dedicated to customer satisfaction since 1980



Advanced Reactive System Screening Tool

*Quickly and safely
identify potential
runaway reactions*

ARSSTTM

Recently improved software for the ARSST is user friendly and simple test setup procedures yield fast turnaround time for experiments. The ARSST is particularly well-suited for chemical systems that generate a significant amount of pressure. A variety of applications include relief system sizing, heat of mixing measurements, and kinetic parameter evaluation.

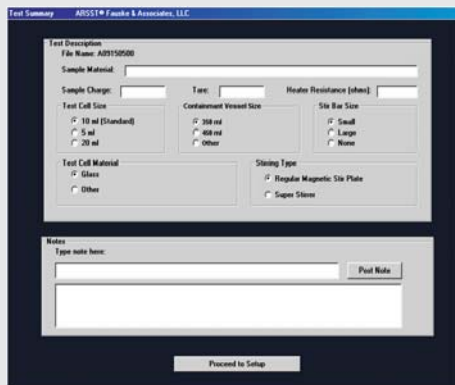
The Advanced Reactive System Screening Tool (ARSST) was developed to provide an easy and inexpensive alternative to the VSP for implementing the DIERS methods. First introduced in 1989 as the RSST, it quickly became a standard industry tool for characterizing reactive chemical systems and acquiring directly scalable relief system design data. New features, including the patented Flow Regime Detector, have since been added to the ARSST as we continue to refine the industry's most cost effective adiabatic calorimeter.

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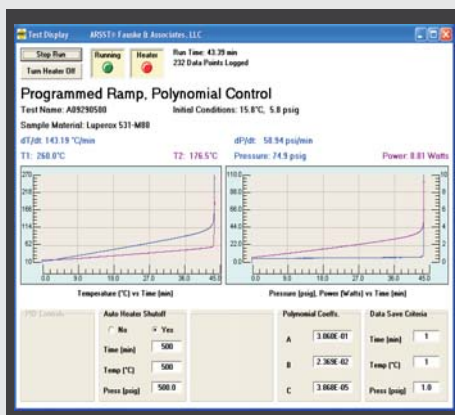
Contact: Jim Burelbach or Kris Fauske

Phone: (630) 323-8750 * Fax: (630) 986-5481 * E-Mail: Info@Fauske.com * ARSST.COM

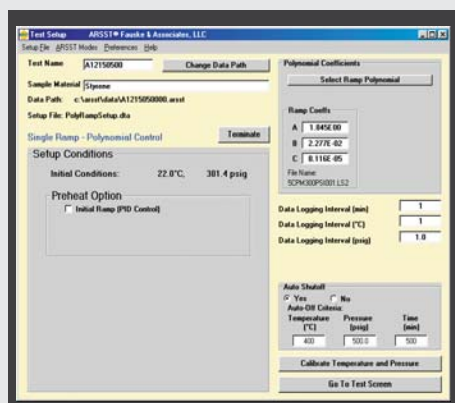
Typical Screens



Summary Screen



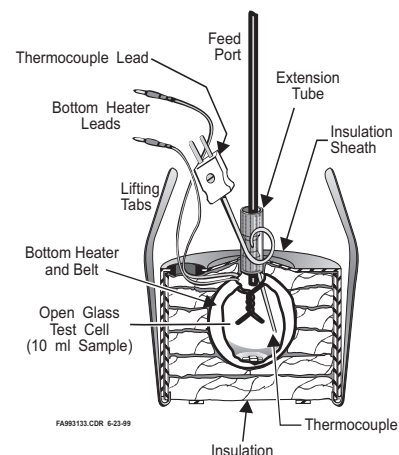
Luperox Run Screen



Setup Screen

ARSST Test Cell

- * Low phi-factor spherical glass test cell
- * Direct measurement of sample temperature
- * Feed port allows injection during an experiment



The easy, reliable way to obtain directly scalable runaway reaction rate data

The ARSST is the product of extensive research into runaway chemical reactions and their impact on process system dynamics. The ARSST is designed to simplify the acquisition of data necessary for thermal hazards analysis, runaway reaction evaluations, and the proper sizing of pressure relief vents. The ARSST concept can be applied to liquids or solids with high or low reaction rates, and it is appropriate for vapor, gaseous or hybrid systems. The measured temperature and pressure rate data can be directly applied to full-scale industrial processes.

The ARSST typically uses 5, 10, or 20 ml magnetically stirred samples contained in an open, well-insulated glass test cell. This configuration minimizes heat sink effects ($\phi = 1.04$) and avoids the transient problems characteristic of a heavy wall sample holder. With a low phi factor essentially all the reaction heat goes to further heat the sample, so it is possible to detect other exotherms that result at elevated temperatures.

Ideal for gassy systems

The ARSST is particularly well suited for gassy systems, in part because it avoids gas solubility issues associated with closed cell testing. The ARSST's unique design allows you to acquire reliable adiabatic pressure and temperature rate data that are difficult to obtain with other commercially available instruments. FAI's patented flow regime detector can distinguish between foamy and non-foamy behavior, and fire exposure heating rates up to 30 C/min are easily simulated.

ARSST

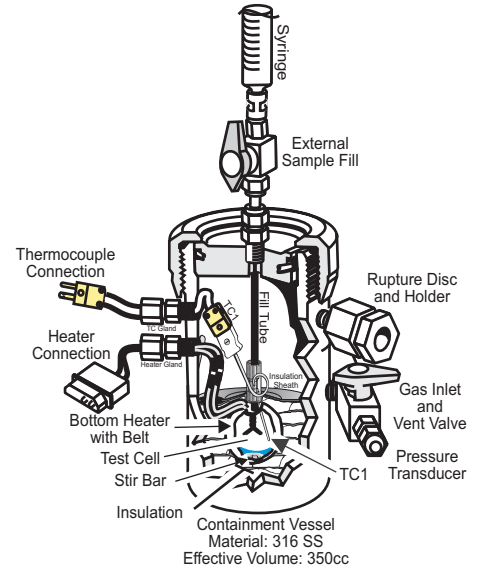
- * The product sample size (5 - 10 g) is large enough to be representative, yet small enough to reduce waste and minimize exposure risk.
- * Tests are safely contained in a 350 ml stainless steel high pressure vessel.
- * Fast setup allows for multiple experiments per day
- * Seven preset testing modes

Optional equipment and features

- * Test summary file is automatically generated and can be up-dated throughout the test, providing electronic records of test setup parameters, operator actions & final conditions.
- * Faster data acquisition frequency provides improved resolution of rapid temperature or pressure events.
- * Dual thermocouple option allows measurement of the vapor space temperature in the neck of the test cell.
- * Temperature measurement is expanded from -50°C to 700°C.
- * The ARSST is available with closed-cell and high phi-factor testing options.
- * The ARSST software is compatible with PCI architecture and Windows XP.

Flow Regime Detection (FRED)

When designing process relief systems, it is helpful to distinguish between foamy and non-foamy behavior during venting. Relief systems for non-foamy systems may be more realistically designed by treating the two-phase discharge flow as churn-turbulent rather than homogeneous or bubbly. The patented Flow Regime Detector allows the user to make this distinction.



As the chemical industry strives to comply with regulatory process safety guidelines, use of AIChE's DIERS (Design Institute for Emergency Relief Systems) technology has become standard practice in many companies. Fauske & Associates was chosen by the AIChE to serve as the principal research contractor for the DIERS project begun in the late 1970's. Since completion of the DIERS project (1984), FAI has remained the world leader in providing innovative products and services to support widespread utilization of the DIERS methodology.





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ARSST Specifications

Phi-Factor:	Typically 1.05, depending on sample mass and heat capacity.
Test Cell:	Spherical, available in 5, 10, or 20 ml sizes
Test Cell Material:	Glass
Sample Size:	From a few grams up to 16 ml
Sample Type:	Liquids and solids
Agitation:	Magnetically stirred
Pressure Vessel:	350 ml for standard vessel 450 ml for high pressure vessel
Pressure Range:	FV to 500 psi (35 bar) for standard vessel FV to 1000 psi (70 bar) for high pressure vessel
Pressure Balancing:	Manual balancing if using closed cell option
Temperature Range:	-50°C to 700°C
Temperature Tracking:	200°C/min at 200°C
Temperature Measurement:	Type K Thermocouples with 0.3°C resolution
Sample Temperature:	Measured directly in the sample
Usual Mode of Operation:	Thermal scan, typically 2°C/min
Available Scan Rates:	Up to 30°C/min
Exotherm Detection Sensitivity:	Typically 0.1°C/min
Flow Regime Detector:	Available option
Dosing:	Syringe, injection piston, or syringe pump
Data Logging Frequency:	Up to 1000 points per second

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