

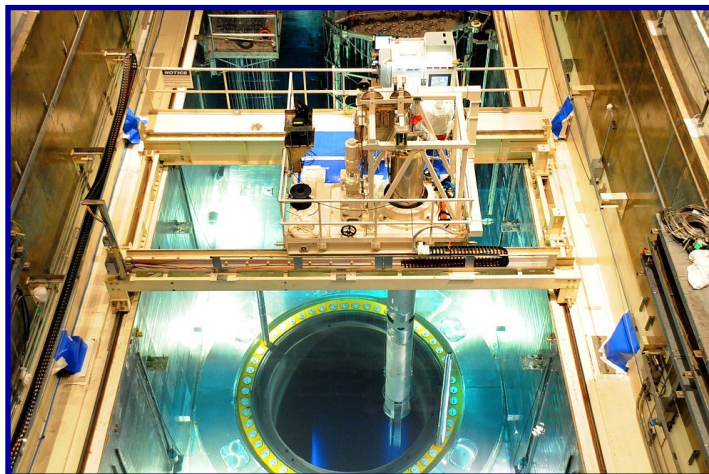
**RHEOTHERM<sup>®</sup>**  
**FLOW INSTRUMENTS**

## **Radiation Hardened Flow Meters**

Environments with high levels of radiation create special challenges, as a single charged particle can knock thousands of electrons loose, leading to signal spikes and electronics noise, which may result in inaccurate or unintelligible signals. This is a particularly serious problem in the design of spacecraft and nuclear power stations.

### **Bionetics has been supplying the Nuclear Industry since 1983**

For nearly 50 years, Rheotherm flow meters have proven to be a robust and accurate solution for industrial and aerospace flow measurement applications. A low maintenance design with no moving parts and excellent chemical compatibility has led to a long useable equipment life. This same reliability from Bionetics' Rheotherm thermal flow meters has led to their use by the nuclear industry, specifically in applications that has or may have radiation present.



**Rheotherm flow meters are suitable for total integrated dosage levels of:**

- **30MRad Low Rad design**
- **1000MRad High Rad design**



**Bionetics Corp.**

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# Nuclear Process Application Examples

**Applications** – Fluid Calibrations ranges from as low as 0.4 Nm<sup>3</sup>/hr to as high as 60 Nm<sup>3</sup>/h for use on process gases including argon mixture, helium, hydrogen, air, and P10 gas

**Customer Satisfaction** - Project Manager reported satisfaction with our Rheotherm meters, and technical support to date. As the project came to a close, Mark stated he wished all of his vendors were as professional as Bionetics.


**Applications** – Fluid Calibrations from 0.036 to 5,675 kg/hr; liquids include sodium hydroxide, salt solutions

**Customer Satisfaction** - Project Manager reported satisfaction with our *Rheotherm* meters, and technical support to date.


**Application** – Fluid Calibration 5-100 Kg/hr of uranium hexafluoride gas

**Customer Satisfaction** - Project Manager reported pleased with our Rheotherm meters, and technical support to date. The customer said, "You did a great job!"

- No moving parts
- Choice of wetted materials
- Advanced signal processing electronics
- Field adjustable
- Maintenance-free
- Long-term reliability



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### Radiation Tolerance Qualification Matrix

**Section 1 Product Qualification.** Worksheet to document radiation tolerance of the proposed instrument. Supplier shall provide radiation tolerance data on each product offering for each component and details of assembly. All the components and compounds used in construction shall be listed.

**Section 1.1 Assembly Components**

ASSEMBLY		Quotation Number	Description
TU½(Rad)(SS)(TC)			Flow sensing transducer
Component	Name	Material	Description
1	Tubing and shell	SS316/316L	Stainless steel
2	RTD	>95% alumina ceramic	Thin film Pt RTD
3	Heater	>95% alumina ceramic	Wire wound heater
4	Wires/Cable	HFI 260	Tin plated copper wire w/ HFI 260 insulation
5	Potting compound	Epoxy 20-2353 and 20-2366	Polyurethane potting compound
6	Solder	SN96.3 AG3.7 Solder	Sn96 rosin activated solder