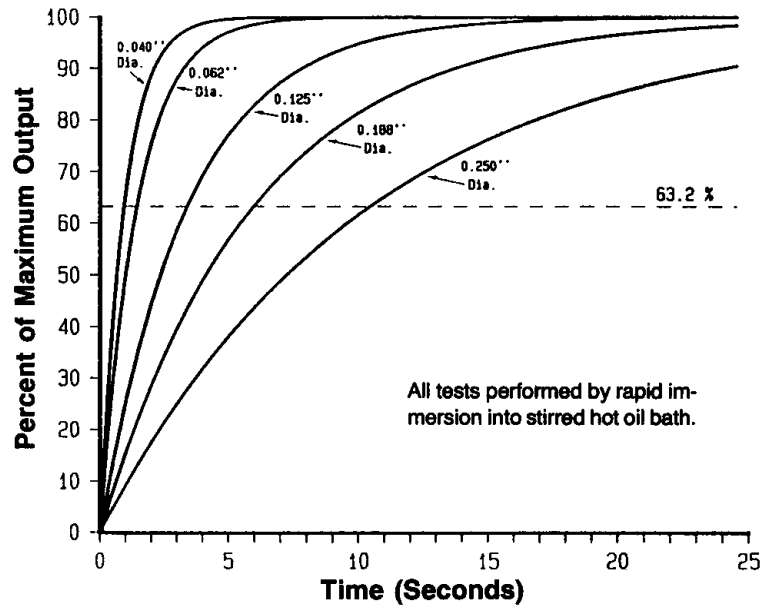


# Comparison of Temperature Sensors and Response Times

## Comparison of Temperature Transducers

	THERMOCOUPLE	RTD	THERMISTOR
Repeatability	2°F to 15°F	0.05°F to 0.1°	0.2°F to 2°F
Stability	1° to 2° drift per year	Less than 0.10% drift in five years	0.2°F to 5°F drift in one year
Sensitivity	10 to 50 microvolts/°C	0.2 to 10 ohms/°C	100 to 1000 ohms/°C
Interchangeability	± 0.75%	± 0.5%	± 0.5%
Temperature Range	- 400°F to 4200°F*	- 200°F to 1600°F	- 150°F to 550°F
Signal Output	0 to 60 millivolts	1 to 6 volts	1 to 3 volts
Unique Features	Greatest economy; highest range	Greatest accuracy over wide spans; highly stable	Greatest sensitivity; lead effects minimized by high impedance
Linearity	Excellent	Excellent	Poor

### Response Times of Sheathed, Grounded Thermocouples



### Time Constants

The time constant of any sensor is defined as the time required for that sensor to respond to 63.2% of its total output signal when subjected to a step change. The step change can be either an increase or decrease in the parameter being measured. Five constants are required for a sensor to reach 99% of its total change. The graph to the right illustrates this relationship.

