

DARPA - CHAP

Instron - UW collaboration

Instron contribution:

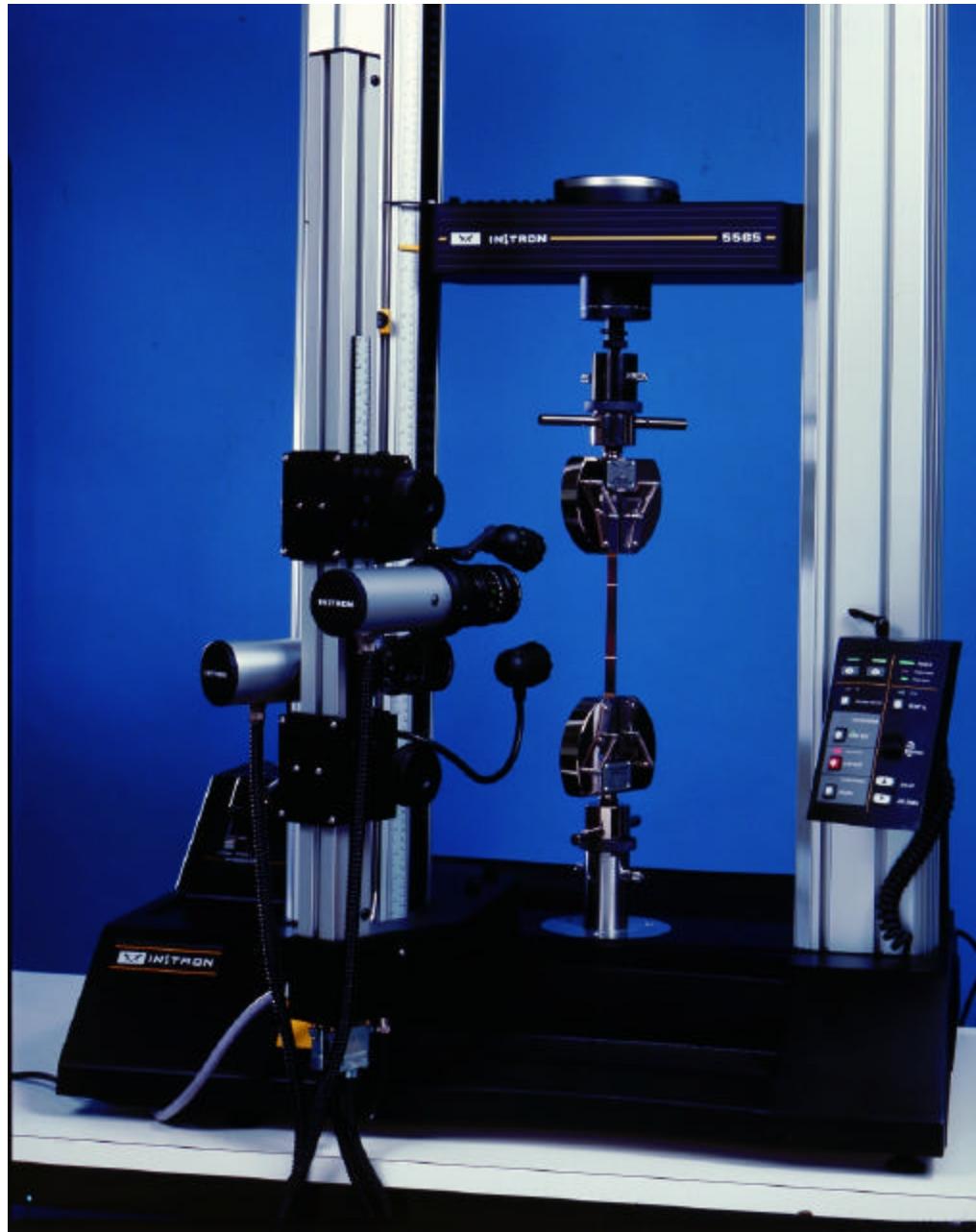
- Control expertise
- Systems engineering
- Prototype manufacture
- Performance evaluation
- Applications report

Instron Core Technologies

- Closed Loop Control:
 - fully digital implementation, 5kHz loop update
 - PID, adaptive and iterative control strategies
- Sensors and Conditioning:
 - loadcells, extensometers, position sensors
 - 5 kHz ac and dc conditioning
- Actuation:
 - DC motor + tachometer, single or twin screws
 - SH actuator with plain or hydrostatic bearings
- Environmental systems:
 - Temperature, vacuum, pressure and humidity

Force	Length	Speed	Temp.	Pressure
5 MN	5 m	30 m/sec	2700C	100 MPa
SH 4-col.	SH m/c dims	SH hi-rate	C-C vac	P int max
500 kN	500 mm	5 m/sec	1600C	20MPa
SH 2-col.	Act. strokes	auto-rigs	Ceramic	SH press
100 kN	50 mm	1m/sec	1150C	0.1 MPa
EM-floor	Spec. GLs	SH m/c	Ni-SX	= 1 bar
30 kN	10 mm	1m/min	800C	1 Pa
EM-table	Ext. strokes	SH / EM	Incoloy	rough vac
1 kN	0.5 mm	1 mm/min	565C	1 mPa
EM 1-col.	smallest stroke	EM m/c	CrMoV	no oxidise
10 N	2 μ m	1 μ m/min	150C	1 μ Pa
smallest L/C	smallest rdg.	Elec. Act.	Al alloy	high vac
20 mN	10 nm	1 μ m/hr	-196C	
smallest rdg.	ultimate res.	slowest	LN ₂	
50 μ N			-269C	
ultimate res.			LHe	

Materials
Testing
Variables



High Resolution
Optical Extensometer
for characterising
Ferromagnetic Shape
Memory Alloys

