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MEASURING THE MECHANICAL PROPERTIES OF AN

INSTRUMENTED TIE ROD

Work Order 48053

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PURPOSE

One instrumented tie rod (B-347, Incorel X750) was submitted to the Engineering Mechanics Section for the purpose of measuring the mechanical properties of the material. One end of the rod was threaded into an adaptor and the other was supported on a support cone. The load was applied at a uniform rate and failure occurred approximately 5/16" above the uppermost thread.

RESULTS

Following are the results obtained:

I.D. in.	O.D. in.	Length in.	Elong- ation* %	Reduction of Area %	Yield Strength**		Ultimate Strength	
					lbs	psi	lbs	psi
0.052	0.122	59-1/4	9.1	10.1	1012	105,500	1476	172,500

* Elongation - Based on 59-1/4" (Length between fillets)

** Yield Strength - 0.2% Offset Method.

Ult. Load = 1670 Lbs.

1013 lbs.

.2%
105,500

LOAD STRAIN CURVE FOR
INSTRUMENTED TIE ROD B-347
INCONEL X-750

Initial Length = 59-1/4"
Final Length = 64-5/8"

	O.D.	I.D.
Before Test	.122"	.056"
After Test	.110"	.046"

Load, Lbs.

Ult. Load = 1670 lbs.

Ult. Stress = 114,500 psi

Yield Strength (.2% Offset)

Load	Stress
1013 lbs.	105,500 psi

Elongation in 59-1/4" = 9.1%

Reduction in Area = 18.1% (at fracture interface)

FIGURE 1

← C →

Elongation - Inches