

Rev	Date	ECN	Issue	Prepared by	Check/Approved
F	19.03.08	309	Revised/Re-issued		
E	01.02.07	----	Revised/Re-issued	T.M.R.	J.S.
D	13.05.99	1786	Revised/Re-issued	A.K.	A.K.
C	21.12.92	0060	Revised/Re-issued	A.K.	D.L.

BS970	709M40	-
AISI4140	-	-

<b>Scope</b>	This specification outlines the modifications and additional requirements to the relevant ASTM Specifications for the supply of Techlok Clamps from closed die forgings to NACE requirements. The mechanical properties are 100/75 ksi to satisfy the minimum design requirements for Techlok Connectors								
<b>Other Applicable Specifications</b>	NACE MR-01-75 (Latest Issue) AISI4140 ASTM A370 / A388 (Latest Issue) ASME V / ASME VIII								
<b>Heat Treatment</b>	Quench and Temper (620°C min)								
<b>Chemical Analysis % (Heat)</b>		<b>Min</b>	<b>Max</b>		<b>Min</b>	<b>Max</b>		<b>Min</b>	<b>Max</b>
	<b>C</b>	0.36	0.44	<b>P</b>	-	0.040	<b>Mo</b>	0.15	0.35
	<b>Si</b>	0.10	0.35	<b>S</b>	-	0.040			
	<b>Mn</b>	0.70	1.00	<b>Cr</b>	0.80	1.20			
<b>Mechanical Properties</b>					<b>Min</b>			<b>Max</b>	
	<b>Tensile (R<sub>m</sub>):</b>				100000psi (689MPa)			-	
	<b>Yield (R<sub>p0.2</sub>):</b>				75000psi (517MPa)			-	
	<b>Elongation (A %):</b>				18			-	
	<b>R. of A (Z %):</b>				50			-	
	<b>Hardness:</b>				-			22HRC	
<b>Impact Properties</b>	Charpy V. 42 J (Ave), 32 J (Min) at -46°C Lateral Expansion to be reported.								
<b>Test Sampling</b>	Test coupons must represent production forgings and should be heat treated with the forgings. Test coupon and forgings to be stacked in the furnace in accordance with good practice to ensure even heat treatment. The test coupons receive essentially the same forging reduction ratio as the production forgings. Test coupons must be taken from production die forgings (clamp size 3" and above). Below 3" clamp size test bar shall be used. Mechanical tests to ASTM A370 after final heat treatment.								

<b>N.D.E</b>	100% UT on Forging Billet in accordance with ASTM A388. (Latest Issue) 100% MPI in accordance with ASME V. Acceptance criteria ASME VIII.
<b>Surface Finish and Quality</b>	Forgings to be supplied free of defects (Slag inclusions, scale, laps, cracks).
<b>Repair of Defects</b>	Weld repair is not acceptable.
<b>Marking</b>	Forgings to be marked with the Heat Number, Material Grade, and Vector Specification.
<b>Certification</b>	Certification in accordance with EN10204-3.1: Chemical Analysis, Mechanical Analysis, Heat Treatment Report/Graphs, UT Report, MPI Report, Mill Certificate (Wet Stamped). Certification must be traceable to each heat treat lot. Certification to reference material grade (AISI 4140) and Vector Specification C216.
<b>Notes</b>	1. Refer to PO for supplemental details. 2. Any deviation from this specification must be formally raised as a concession request prior to delivery. Certification must include concession documentation.

LOCATION OF TENSILE/IMPACT SPECIMEN TAKEN FROM PRODUCTION FORGINGS

