

H142 Rev E – ASTM A350-LF2

Rev	Date	ECN	Issue	Prepared by	Check/Approved
E	02.01.08	251	Revised/ Re-issued	T.S.	J.S.
D	01.02.06	132	Revised/ Re-issued	A.K.	A.K./ N.R.
C	05.03.99	1753	Revised/ Re-issued	A.K.	J.S./ A.K.
B	07.04.97	101	Revised/ Re-issued	A.K.	D.L./ J.S.

Product Form	Standard	Grade	Acceptable Class
Forged Bar	ASTM A350	LF2 (Modified)	Class 1
Blank	ASTM A105	(Modified)	-
Ring	ASTM A694	F52 (Modified)	
Closed Die Forging			

Scope	This specification outlines the modifications and additional requirements to the relevant ASTM Specifications for the supply of raw material to manufacture Vector International products.								
Other Applicable Specifications	ASTM A370 (Latest Issue)								
Steel Making	Forging manufacture to be in accordance with ASTM A350 (Latest Issue)								
Heat Treatment	Quench and Temper 650°C min. Normalise - <i>Note: Typically for smaller sections.</i> Alternative Heat Treatment: Normalise (at 940°C for 2hours), Air Cool, Reheat (870°C for 1hour min), Quench and Temper (650°C min for 1hour) - <i>Note: Suggested for large sections if required.</i>								
Chemical Analysis % (Heat)		Min	Max		Min	Max		Min	Max
	C	-	0.22	S	-	0.025	Cu	-	0.40
	Si	0.15	0.30	Ni Cr	-	0.40	Nb	-	0.04
	Mn	0.6	1.35	Mo	-	0.30	V	-	0.05
	P	-	0.025		-	0.12	CE	-	0.43
	<i>Note: CE = C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15</i>								
Mechanical Properties					Min		Max		
	Tensile (R_m):				70000psi (483MPa)		-		
	Yield (R_{p0.2}):				52000psi (359MPa)		-		
	Elongation (A %):				22		-		
	R. of A (Z %):				30		-		
	Hardness:				-		197HB		
	<i>Note: Hardness check on forgings as per ASTM A350. Contact Vector if below 140HB.</i>								

Impact Properties	Charpy V. 54J (Ave), 40J (Min) at -46°C. Lateral Expansion to be reported.
Extent of Testing	Testing to be in accordance with ASTM A350 (Latest Issue).
Test Sampling	Mechanical Testing shall be carried out in accordance with ASTM A350 'Mechanical Properties' (Latest Issue). Where closed die forgings are used the test coupon must be taken from production forging. Mechanical Tests to ASTM A370 after final heat treatment.
Surface Finish and Quality	Forgings to be of sufficient quality for MPI check. MPI on finished machined parts to be undertaken by Vector International Ltd. Forgings to be supplied free of defects (Slag inclusions, scale, laps, cracks).
Repair of Defects	Weld repair is not acceptable.
Marking	Forgings to be marked with the Heat Number, Material Grade, and Vector Specification.
Certification	Certification in accordance with EN10204-3.1: Chemical Analysis, Mechanical Analysis, Heat Treatment Report / Graphs, Mill Certificate (Wet Stamped). Material to be triple certified to ASTM A105 / A350-LF2 / A694-F52.
Notes	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.