MBH ANALYTICAL LTD.
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CERTIFICATE OF ANALYSIS

Reference Material Type MILD STEEL (WROUGHT)

Catalogue Section: 12 X Sample No: 354 Batch No: A

Certified Values

ELEMENT	C	Si	Mn	S	P	Al
%	0.27	0.19	0.86	0.015	0.066	0.01
	B	Co	Sb	V	Nb	Zr
%	(0.0002)	0.03	0.05	0.02	0.07(5)	0.03

Form and Size: Disc 40mm diameter x 15mm thickness

Supplied by: MBH Analytical Limited

Produced by: Willan Metals Limited

Date of Certification: 21 June 1993 (Replaces Single Page Certificate dated 16.3.1989)

Intended Use: With Optical Emission and X-Ray Fluorescence Spectrometers.

Recommended Method of Use: Steels are generally prepared by linishing (avoiding contamination with abrasives), milling or turning on a lathe (avoiding the use of lubricants) or lapping (using a suitable polishing media). However, users are recommended to follow the calibration and sample preparation procedures specified by the relevant instrument manufacturer. Preparation should be the same for reference materials and the samples for test. When using O.E. a minimum of three consistent replicate analyses is recommended to optimise precision and accuracy. Users are advised to check against possible bias between reference materials and production samples due to difference in metallurgical history and be aware of possible inter-element effect.

MBH ANALYTICAL LIMITED D.J. Morgan

CERT. No. 0524

V.A.T. REGISTERED No. GB 421 3295 82
Registered in England. Registered No. 1875653
Directors: D.Moore D.J. Willis
Registered Office: Regency House, 33 Wood Street, Barnet, Herts. EN5 4BE

ISO9002:BS5750 Pt 2:EN29002

Chemical Analysis Data:

Sample:	C %	Si %	S %	P %	Mn %	Co %
1	0.26	0.19	0.015	0.063	0.86	0.032
2	0.27	0.19	0.015	0.068	0.854	0.026
3	0.28	-	0.015	-	-	-
4	-	-	-	0.066	-	-
Mean:	0.27	0.19	0.015	0.066	0.857	0.029
Stan. Deviation:	0.01	-	-	0.002	0.003	0.003

Sample:	Al %	Nb %	V %	B %	Sb %	Zr %
1	0.010	0.08	0.02	-	0.053	0.035
2	0.016	0.07	0.02	(0.0002)	0.055	0.024
3	-	-	-	-	-	-
4	0.011	-	-	-	-	-
Mean:	0.012	0.075	0.02	(0.0002)	0.054	0.03
Stan. Deviation:	0.003	0.005	-	-	-	0.005

Participating Laboratories:

Willan Metals Limited	Rotherham, England	NAMAS Approval 0014
Metals Tech (Testing) Ltd	Sheffield, England	NAMAS Approval 0963
Ross & Catherall Limited	Killamarsh, England	NAMAS Approval 0178

Analytical Methods Used:

Carbon	(a)		Combustion	IRD	BS6200
Silicon	(a)	(b)	Gravimetric		Atomic Absorption
Sulphur	(a)		Combustion	IRD	BS6200
Phosphorus	(a)		Colorimetric	BS6200	
Manganese	(a)	(b)	Colorimetric	BS6200	Atomic Absorption
Cobalt	(a)	(b)	Atomic Absorption		BS6200
Aluminium	(a)		Atomic Absorption		BS6200
Niobium	(a)	(b)	Gravimetric		
Vanadium	(a)	(b)	Atomic Absorption		BS6200
Boron			Colorimetric		
Antimony			Atomic Absorption		
Zirconium			XRF Solution		Atomic Absorption

NOTE

1 (a) Overchecked by OES
(b) Overchecked by XRF

2. Data in brackets is not certified and is for guidance only.