

Brammer Standard Company Certificate of Analyses

H-12

Tool Steel

B.S. No. TH-12

<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Cu</u>
0.372	0.40	0.020	0.005	0.92	0.064
<u>Ni</u>	<u>Cr</u>	<u>Mo</u>	<u>V</u>	<u>W</u>	<u>Co</u>
0.16	5.02	1.41	0.62	1.06	0.07

Some of the testing laboratories were:

Allegheny Ludlum Steel, Brackenridge, PA
Allegheny Ludlum Steel, Lockport, NY
Brammer Standard Company, Houston, TX
Crucible Inc./Specialty Metals Div., Syracuse, NY
Midstates Analytical Laboratories, Inc., Tulsa, OK

See reverse side for additional data.

Certificate No. TH12-082588

B.S. No. TH-12 Tool Steel

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Analysis Number	C	Mn	P	S	Si	Cu	Ni	Cr	Mo
1	0.370	0.380	0.016	0.004	0.900	0.059	0.150	4.88	1.35
2	0.370	0.393	0.019	0.005	0.900	0.059	0.155	4.95	1.37
3	0.373	0.396	0.019	0.005	0.920	0.067	0.156	5.00	1.40
4	0.376	0.400	0.020	0.005	0.926	0.070	0.160	5.00	1.42
5		0.400	0.022		0.930		0.160	5.01	1.42
6		0.410					0.180	5.08	1.44
7		0.410						5.10	1.45
8								5.11	
Average	0.3723	0.3984	0.0192	0.0048	0.9152	0.0638	0.1602	5.016	1.407
Std.Dev.	0.0029	0.0104	0.0022	0.0005	0.0143	0.0056	0.0104	0.079	0.036
Certified	0.372	0.40	0.020	0.005	0.92	0.064	0.16	5.02	1.41

continued

Analysis Number	W	V	Co	Sn	Al	Nb	Ti
1	1.04	0.56	0.064	0.007	0.005	0.005	0.004
2	1.05	0.61	0.069	0.009		0.006	0.004
3	1.05	0.62	0.072				0.007
4	1.06	0.62	0.076				
5	1.09	0.63	0.080				
6		0.63					
7		0.64					
Average	1.058	0.616	0.0722	0.0080		0.0055	0.0050
Std.Dev.	0.019	0.026	0.0062	0.0014		0.0007	0.0017
Certified	1.06	0.62	0.07	(0.008)		(0.006)	(0.005)

Data in parentheses is not certified but provided for information only.


Chemical analyses were made on millings from the cross-section of the bars. The values listed above are the individual analytical results for the elements listed.

This Reference Material (RM) was produced by hot-rolling and annealing. This RM should be used and compared with material of similar metallurgical history as it may not plot well with chill cast materials on some instruments.

Inquiries concerning this Reference Material should be directed to:

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