PRECISION MARSHALL STEEL COMPANY
One Northpoint Court, Bolingbrook IL 60440
Toll Free: 1-800-258-2558 - www.pmsteel.com

CERTIFICATION OF DRILL ROD

PRODUCT INFORMATION

Grade	Thickness	Heat #	Country of Origin	Country of Melt	Purchase Order
W1	0.5000	PM20244	Netherlands	Netherlands	P1567120

CHEMICAL COMPOSITION

C: 0.9200 Mn: 0.4000 P: 0.0070 S: 0.0090 Si: 0.2600 Cr: 0.0800 Mo: 0.0200 Ni: 0.0500 Cu: 0.1000 V: 0.0020

STANDARD INFORMATION

STANDARD CHEMICAL COMPOSITION

AISI	Carbon	Manganese	Silicon	Sulfur	Chromium	Vanadium	Tungsten	Molybdenum	Phosphorous	Nickel
W1	.90/1.05	.30/.40	.10/.40	.025 Max	.30 Max	.10 Max	.15 Max	.10 Max	.025 Max	-
O1	.85/1.00	1.00/1.40	.10/.50	0.030 Max	.40/.70	.30 Max	.40/.60	--	.030 Max	-
A2	.95/1.05	.40/1.00	.50 Max	0.030 Max	4.75/5.50	.15/.50	--	.90/1.40	.030 Max	-
S7	.45/.55	.20/.90	.20/1.00	0.030 Max	3.00/3.50	.35 Max	--	.10 Max	.030 Max	-
D2	1.40/1.60	.10/.60	.10/.60	0.030 Max	11.00/13.00	.50/1.10	--	.70/1.20	.030 Max	-
M2	.78/1.05	.15/.40	.03/.02	.03 Max	3.75/4.50	1.75/2.20	5.50/6.75	4.50/5.50	.40 Max	-
H13	.40	--	1.00	.100	5.25	1.00	-	1.35	--	-
304L	.03 Max	2 Max	1 Max	.03 Max	18/20	--	-	-	.045 Max	8/12

SPECIFICATIONS					MACHINEABILITY	CONDITION	SURFACE / STRUCTURE		
AISI	SAE	ASTM	FEDERAL	UNS	Rating	Treatment	Size	Finish (Max)	Quality (Max Defect)
W1	J-437	A686-92(2016)	QQ-T-580 Rev.C	T72301	100	Annealed	.000-.1250	10 RMS	0.000
O1	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T31501	90	Annealed	.1251-.2500	15 RMS	0.000
A2	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T30102	65	Annealed	.2501-.8750	20 RMS	0.000
S7	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T41907	95	Annealed	.8751-2.000	30 RMS	0.000
D2	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T30402	50	Annealed	All CD Flats	50 RMS	.008/side
M2	J438-B	A600-92a(2024)	QQT-570 Rev. C	T11302	65	Annealed			
H13	J-437	A681-08 (2022)	QQ-T-570 Rev.C	--	75	Prehard			
304L	S30403	A276	QQ-S-763	S30403	70	Annealed			

1 Certain heats may not meet the ASTM specification for Manganese
2 Certain sizes may not meet the ASTM specification for hardness.

** Grain Size: 5-8 (McQuade-Ehn)*
** Microstructure: 85% min. spheroidization*

HARDNESS

Size	W1	O1	A2	S7	D2	H13	M2	304L
.0000-.1250	166,000 psi	116,000 psi	128,000 psi	123,000 psi	131,000 psi	40-48 HRC	248 HB	215 HB
.1251-.2500	28 HRC	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB
.2501-.5000	23 HRC	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB
.5001-2.000	96 HRB	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB

** For sizes under 5/32" diameter, a tensile strength is obtained.*

SIZE		LENGTH	
Diameter	Tolerance	Length	Tolerance
.0000-.1249	+/-.0003	3'	36" +1/8,-0
.1250-.499	+/-.0005	6'	72" +1,-0
.500-3.00	+/-.001	12'	144" +2,-0

Precision Marshall Steel Company hereby attests that drill rod items as supplied have been tested and certified to meet all of the standards and limitations as set forth above.

Material is RoHs, REACH, and Conflict Mineral compliant. The letter confirming compliance can be found on our website or distributor portal.

Certified: Adam Helphenstine
Manager of Materials

Date: 3/20/2026

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CERTIFICATION OF DRILL ROD

PRODUCT INFORMATION

Grade	Thickness	Heat #	Country of Origin	Country of Melt	Purchase Order
W1	0.3750	PM20244	Netherlands	Netherlands	P1567120

CHEMICAL COMPOSITION

C: 0.9200 Mn: 0.4000 P: 0.0070 S: 0.0090 Si: 0.2600 Cr: 0.0800 Mo: 0.0200 Ni: 0.0500 Cu: 0.1000 V: 0.0020

STANDARD INFORMATION

STANDARD CHEMICAL COMPOSITION

AISI	Carbon	Manganese	Silicon	Sulfur	Chromium	Vanadium	Tungsten	Molybdenum	Phosphorous	Nickel
W1	.90/1.05	.30/.40	.10/.40	.025 Max	.30 Max	.10 Max	.15 Max	.10 Max	.025 Max	-
O1	.85/1.00	1.00/1.40	.10/.50	0.030 Max	.40/.70	.30 Max	.40/.60	--	.030 Max	-
A2	.95/1.05	.40/1.00	.50 Max	0.030 Max	4.75/5.50	.15/.50	--	.90/1.40	.030 Max	-
S7	.45/.55	.20/.90	.20/1.00	0.030 Max	3.00/3.50	.35 Max	--	.10 Max	.030 Max	-
D2	1.40/1.60	.10/.60	.10/.60	0.030 Max	11.00/13.00	.50/1.10	--	.70/1.20	.030 Max	-
M2	.78/1.05	.15/.40	.03/.02	.03 Max	3.75/4.50	1.75/2.20	5.50/6.75	4.50/5.50	.40 Max	-
H13	.40	--	1.00	.100	5.25	1.00	-	1.35	--	-
304L	.03 Max	2 Max	1 Max	.03 Max	18/20	--	-	-	.045 Max	8/12

SPECIFICATIONS					MACHINEABILITY	CONDITION	SURFACE / STRUCTURE		
AISI	SAE	ASTM	FEDERAL	UNS	Rating	Treatment	Size	Finish (Max)	Quality (Max Defect)
W1	J-437	A686-92(2016)	QQ-T-580 Rev.C	T72301	100	Annealed	.000-.1250	10 RMS	0.000
O1	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T31501	90	Annealed	.1251-.2500	15 RMS	0.000
A2	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T30102	65	Annealed	.2501-.8750	20 RMS	0.000
S7	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T41907	95	Annealed	.8751-2.000	30 RMS	0.000
D2	J-437	A681-08 (2022)	QQ-T-570 Rev.C	T30402	50	Annealed	All CD Flats	50 RMS	.008/side
M2	J438-B	A600-92a(2024)	QQT-570 Rev. C	T11302	65	Annealed			
H13	J-437	A681-08 (2022)	QQ-T-570 Rev.C	--	75	Prehard			
304L	S30403	A276	QQ-S-763	S30403	70	Annealed			

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HARDNESS

Size	W1	O1	A2	S7	D2	H13	M2	304L
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.1251-.2500	28 HRC	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB
.2501-.5000	23 HRC	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB
.5001-2.000	96 HRB	100 HRB	27 HRC	25 HRC	28 HRC	40-48 HRC	248 HB	215 HB

** For sizes under 5/32" diameter, a tensile strength is obtained.*

SIZE		LENGTH	
Diameter	Tolerance	Length	Tolerance
.0000-.1249	+/-.0003	3'	36" +1/8,-0
.1250-.499	+/-.0005	6'	72" +1,-0
.500-3.00	+/-.001	12'	144" +2,-0

Precision Marshall Steel Company hereby attests that drill rod items as supplied have been tested and certified to meet all of the standards and limitations as set forth above.

Material is RoHs, REACH, and Conflict Mineral compliant. The letter confirming compliance can be found on our website or distributor portal.

Certified: Adam Helphenstine
Manager of Materials

Date: 3/20/2026

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CERTIFICATION OF GROUND FLAT STOCK

PRODUCT INFORMATION

Grade	Thickness	Heat #	Country of Origin	Country of Melt	Purchase Order
D2	0.1350	PM20220	Germany	Germany	P1567120

CHEMICAL COMPOSITION

C: 1.5200 Mn: 0.4000 P: 0.0220 S: 0.0070 Si: 0.4400 Cr: 11.4000 Mo: 0.7400 V: 0.8100

STANDARD INFORMATION

**** All ground flat stock supplied by Precision Marshall Steel complies with DFARS requirements that state certain specialty metals must be melted and produced in the US or a qualifying country.**

STANDARD CHEMICAL COMPOSITION

AISI	UNS	Carbon	Manganese	Silicon	Phosphorous (Max)	Sulfur (Max)	Chromium	Vanadium	Tungsten	Molybdenum
A2	T30102	.95/1.05	.40/.60	.20/.35	.025	.005	4.90/5.30	.15/.20	--	.90/1.10
O1	T31501	.90/1.00	1.00/1.15	.20/.35	.020	.020	.40/.60	.30 Max	.40/.60	--
S7	T41907	.48/.53	.50/.70	.20/.40	.035	.003	3.10/3.40	.20/.30	--	1.30/1.60
4140/42	G41420	.38/.46	.70/1.00	.15/.30	.035	.040	.80/1.15	-	--	.15/.25
D2	T30402	1.50/1.60	.20/.40	.20/.60	.030	.020	11.25/12.0	.80/1.00	--	.70/.80
C-1018	G10180	.15/.25	.60/.90	--	.040	.050	--	--	--	--
C-1018 (Under .250")		.03/.25	.90 Max	--	.040	.050	--	--	--	--
440C	S44004	1.05	.40	.40	--	--	17.00	--	--	.40
410	S41000	.13	.05	.40	--	--	12.00	-	--	--
420	S42000	.46	.40	.40	--	--	13.00	.30	--	--
M2	T11302	.78/1.05	.15/.40	.20/.45	.030	.030	.20/.45	1.75/2.20	5.50/6.75	4.50/5.50
H13	T20813	.32/.45	.20/.60	.80/1.25	.030	.030	4.75/5.5	.80/1.20	--	1.10/1.75

SPECIFICATIONS					HARDNESS	MACHINABILITY	CONDITION	SURFACE TOLERANCE AND SQUARENESS		
GRADE	AISI	SAE	ASTM	FEDERAL	BRINELL	RATING	Treatment		Regular (in)	Oversize (in)
A2	A-2	J-437	A681-08(2022)	QQ-T-570 Rev.C	200-235	65	Annealed	Thick. 18-36	+/-.001	+.010/+.015
O1	O-1	J-437	A681-08(2022)	QQ-T-570 Rev.C	177-212	95	Annealed	Thick. 72	+/-.002	
S7	S-7	J-437	A681-08(2022)	QQ-T-570 Rev.C	188-223	95	Annealed	Width	+.005/-.000	+.010/+.015
NT	4140/42	--	A829	--	262-321	85	Prehard	Length 18	+.125/+.250	+.125/+.250
D2	D-2	J-437	A681-08(2022)	QQ-T-570 Rev.C	220-255	50	Annealed	Length 24	+.1875/+.375	+.1875/+.375
LC	C-1018	--	A1018	635	168 MAX	--	Annealed	Length 36	+.250/+.500	+.250/+.500
440C	440C	--	A276-17	QQ-S-763	--	--	Annealed	Length 72	+.250/+.750	+.250/+.750
410	410	--	A240	QQ-S-763	--	--	Annealed	Squares	+/-.001	+.010/+.015
420	420	--	A276-17	QQ-S-763	--	--	Annealed		Metric (mm)	
M2	M-2	--	A600-92a(2024)	QQ-T-590	255 MAX	--	Annealed	Thick.	+/- .0254	
H13	H13	J467	A681-08(2022)	QQ-T-570	235 MAX	75	Annealed	Length	+6.35 / +12.7	

Precision Marshall Steel Company hereby attests that ground flat stock items as supplied have been tested and certified to meet all of the standards and limitations for ground flat stock as set forth above.

Material is RoHs, REACH, and Conflict Mineral compliant. The letter confirming compliance can be found on our website or distributor portal.

Certified: Adam Helphenstine
Support Services

Date: 3/20/2026