SHENLONG

Henan Shenlong's Non Magnetic Products

- Non Magnetic Drill Collar
- Non Magnetic FLEX Collar
- Non Magnetic Stabilizer
- Non Magnetic Subs

Henan Shenlong Petroleum Drilling Tools Co.,Ltd

— www.petrodrillingtools.com —

Content

Non Magnetic Product

Non Magnetic Drill Collar

Non Magnetic Flex Collar

Non Magnetic Stabilizer

Non Magnetic Subs

Quality Assurance


Certificate of Authority to use the Official API Monogram
License Number: 7-1-0622
ORIGINAL
The American Petroleum Institute hereby grants to
HENAN SHENLONG PETROLEUM DRILLING TOOLS CO., LTD.
Yugong South Road
Tech Zone
Jiyuan City, Henan
People's Republic of China
In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: 7-1-0622
The scope of this license includes the following: Threading for Rotary Shouldered Connections, Heavy Weight Drill Pipe, Drill Collars, Drill Stem Subs
QMS Exclusions: Design and Development
Effective Date: OCTOBER 20, 2023
Expiration Date: OCTOBER 28, 2026
To verify the authenticity of this license, go to www.api.org/compositelist.
American Petroleum Institute


REGISTRATION NO. Q1-2416
Certificate of Registration
The American Petroleum Institute certifies that the quality management system of
HENAN SHENLONG PETROLEUM DRILLING TOOLS CO., LTD.
Yugong South Road
Tech Zone
Jiyuan City, Henan
People's Republic of China
has been assessed by the American Petroleum Institute and found to be in conformance with the following:
API Spec Q1, 9th Edition
The scope of this registration and the approved quality management system applies to the
Manufacture of Non-Magnetic Solid Bar and Rotary Drill Stem Elements; Provision of Threading Services for Rotary Shouldered Connections
API approves the organization's justification for excluding
Design and Development
Effective Date: OCTOBER 20, 2023
Expiration Date: OCTOBER 28, 2026
Registered Since: OCTOBER 28, 2014
API Spec Q1 Registered
Senior Vice President of Global Industry Services


NS-1 LEVEL 3 FACILITY
FACILITY APPROVAL 2025
工厂认证 2025
Henan Shenlong Petroleum Drilling Tools Co., Ltd.
河南神龙石油钻具有限公司
Spec Q1 (API) 10th Edition
Fearnley Group International Limited NS-1™ Edition 3 (Online Edition) Quality and Inspection Requirements for New and Refurbished Drilling and Well Completion Equipment Standards.
FEARNLEY GROUP INTERNATIONAL LIMITED
Issued By
Kevin Fearnley
Chairman NS-1™ Technical Review Committee


NGV
Quality Management System Certificate
Certificate No.: 05325Q30016R6M
we hereby certify that
Henan Shenlong Petroleum Drilling Tools Co.,Ltd
Registered/Production/Business/Office Address: No. 235, Yugong South Road, High-tech Development Zone, Jiyuan City, Henan Province
Quality Management System complies with Standard requirement
GB/T 19001-2016/ISO 9001:2015
The certificate is valid for the following scope:
The production of petroleum drilling tools: Drill Collar, Integral HWDP, Kelly, Subs, Stabilizer, Non-magnetic solid bars
Certificate Date: 14-08-2025
Certificate Valid Date: 14-08-2025~13-08-2028
Date of initial Certification: 11-09-2007
Unified Social Credit Code of the Certified Organization: 91419001796775193C
IAF CNAS
Beijing NGV Certification Center Co.,Ltd.

Test carried out on each bar of Non mag product

1. Chemical Composition
2. Metallographic Test
3. Tensile Test
4. Impact Test
5. Hardness Test
6. Corrosion Test Practice A
7. Corrosion Test Practice E
8. Fatigue Test (According to customer’s requirement)
9. Relative Magnetic Permeability Test
10. Field gradient (Hot spot) Test
11. Ultrasonic Test
12. Penetrate Test

Chemical Composition

	SLW-1	SLW-2	SLW-3	PR110 PR140	PRU140
C	≤0.06	≤0.03	≤0.03	≤0.03	≤0.04
Si	≤1.00	≤1.00	≤1.00	≤1.00	≤1.00
Mn	16.00~ 20.00	18.00~ 22.00	18.50~ 23.00	18.50~ 23.00	4.00~ 7.00
P	≤0.035	≤0.035	≤0.040	≤0.040	≤0.035
S	≤0.01	≤0.01	≤0.01	≤0.01	≤0.01
Cr	13.00~ 16.00	13.00~ 16.00	16.50~ 20.00	16.50~ 20.00	19.00~ 23.00
Mo	0.40~0.80	0.40~0.80	0.40~0.80	2.00~3.00	4.00~6.00
Ni	1.00~3.00	1.00~3.00	1.00~3.00	3.00~4.00	17.00~21.00
N	0.25~0.45	0.30~0.45	0.50~0.80	0.50~0.80	≥0.35
Nb	≤0.10	≤0.10	≤0.10	≤0.10	≤0.10
PRE	—	—	≥28	≥34	≥42

Mechanical Strength

Grade	OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
		MPa	psi	Mpa	psi			
SLW-1	3 1/8~ 3 7/8	≥827	≥120,000	≥896	≥130,000	≥20	Average≥100 Single≥81	≥285
	4~6 7/8	≥758	≥110,000	≥827	≥120,000			
	7~11	≥689	≥100,000	≥758	≥110,000			
SLW-2	3 1/8~ 6 7/8	≥827	≥120,000	≥896	≥130,000	≥20	Average≥150 Single≥125	≥285
	7~11	≥758	≥110,000					
SLW-3	3 1/8~ 6 7/8	≥965	≥140,000	≥1034	≥150,000	≥20	Average≥100 Single≥81	≥300
	7~11	≥896	≥130,000					
PR110	3 1/8~8	≥759	≥110,000	≥827	≥120,000	≥20	Average≥100 Single≥81	255~430
	8 1/8~11	≥690	≥100,000					
PR140	3 1/8~8	≥965	≥140,000	≥1034	≥150,000	≥20	Average≥100 Single≥81	301~425
	8 1/8~11	≥896	≥130,000					
PRU140	3 1/8~8	≥965	≥140,000	≥1034	≥150,000	≥18	Average≥135 Single≥100	300~440
	8 1/8~11	≥896	≥130,000					

Non Magnetic Properties and NDE Inspection

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.

Magnetic Properties requirements:

Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

Non-Destructive Inspection

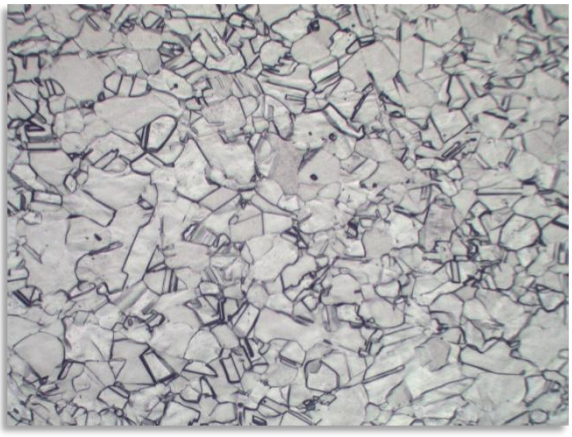
Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
100% area of each non mag product has been penetrate tested within the whole length.

Intergranular Corrosion Test

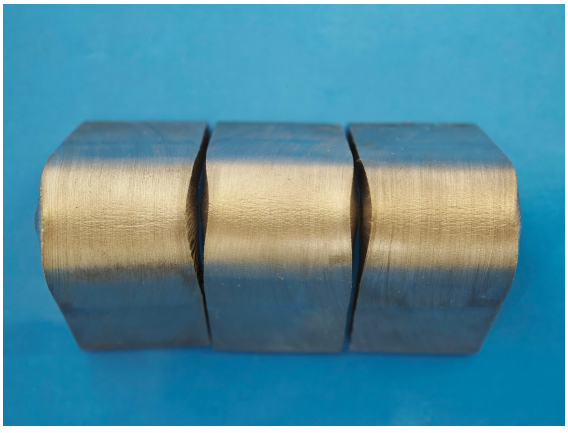
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.

A sample from each forged bar is tested in accordance with ASTM A262 Practice “A”, the Oxalic Acid Etch Test. No ditch structure shall be observed.

A sample from each forged bar is tested in accordance with ASTM A262 Practice “E”, Copper-Copper Sulfate-Sulfuric Acid Test, without sensitizing treatment. Then the susceptibility to intergranular attack is determined by a bend test.



Practice A



Practice E

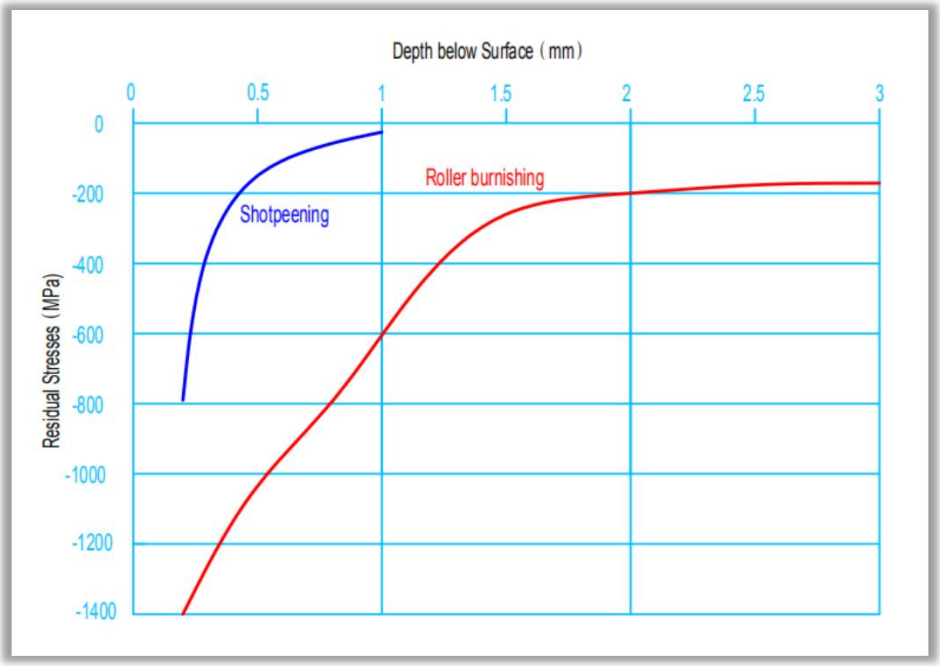
Stress Corrosion Resistance

SLW-1, SLW-2 and SLW-3 material typically have good stress corrosion resistance properties.

PR110, PR140 and PRU140 material is extremely resistant to stress corrosion when using in the high chloride drilling mud condition.

Additional protection against stress corrosion cracking is achieved by deep compressive treatment of any surface exposed to drilling muds. The outside surface of the non mag forged bar has compressive residual stresses from warm forging process. The inner surface will be treated by roller burnishing or shot peening after final deep hole boring process.

Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.



Pitting Corrosion Resistance

The pitting corrosion resistance is normally measured by the PRE value illustrated by the following formula.

The pitting resistance equivalent (PRE)

PRE = Cr + 3.3Mo + 16N

PRE SLW-3 ≥28
PRE PR110、PR140 ≥34
PRE PRU140 ≥42

• Chemical Composition

Steel Grade: SLW-1										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.06	≤1.00	16.00~ 20.00	≤0.035	≤0.01	13.00~ 16.00	0.40~ 0.80	1.00~ 3.00	0.25~ 0.45	≤0.10	—

• Mechanical Properties

Steel Grade: SLW-1							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8 ~ 3 7/8	≥827	≥120,000	≥896	≥130,000	≥20	Average≥100 Single≥81	≥285
4 ~ 6 7/8	≥758	≥110,000	≥827	≥120,000			
7 ~ 11	≥689	≥100,000	≥758	≥110,000			

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.
Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

• NDE Inspection

Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
100% area of each non mag product has been penetrate tested within the whole length.

• Corrosion Resistance

-Intergranular Corrosion Test:
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.
- Stress Corrosion Resistance:
Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.
We can assure the layer of compressive residual stress can be measured even at 2mm deep. (API requires at 1mm deep)

• Chemical Composition

Steel Grade: SLW-2										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.03	≤1.00	18.00~ 22.00	≤0.035	≤0.01	13.00~ 16.00	0.40~ 0.80	1.00~ 3.00	0.30~ 0.45	≤0.10	—

• Mechanical Properties

Steel Grade: SLW-2							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8 ~ 6 7/8	≥827	≥120,000	≥896	≥130,000	≥20	Average≥150 Single≥125	≥285
7 ~ 11	≥758	≥110,000					

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.
Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

• NDE Inspection

Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
100% area of each non mag product has been penetrate tested within the whole length.

• Corrosion Resistance

-Intergranular Corrosion Test:
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.
- Stress Corrosion Resistance:
Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.
We can assure the layer of compressive residual stress can be measured even at 2mm deep. (API requires at 1mm deep)

• Chemical Composition

Steel Grade: SLW-3										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.03	≤1.00	18.50~ 23.00	≤0.040	≤0.01	16.50~ 20.00	0.40~ 0.80	1.00~ 3.00	0.50~ 0.80	≤0.10	≥28

• Mechanical Properties

Steel Grade: SLW-3							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8 ~ 6 7/8	≥965	≥140,000	≥1034	≥150,000	≥20	Average≥100 Single≥81	≥300
7 ~ 11	≥896	≥130,000					

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.
Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

• NDE Inspection

Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
100% area of each non mag product has been penetrate tested within the whole length.

• Corrosion Resistance

-Intergranular Corrosion Test:
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.
- Stress Corrosion Resistance:
Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.
We can assure the layer of compressive residual stress can be measured even at 2mm deep. (API requires at 1mm deep)

• Chemical Composition

Steel Grade: PR110										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.03	≤1.00	18.50~ 23.00	≤0.040	≤0.01	16.50~ 20.00	2.00~ 3.00	3.00~ 4.00	0.50~ 0.80	≤0.10	≥34

• Mechanical Properties

Steel Grade: PR110							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8 ~ 8	≥759	≥110,000	≥827	≥120,000	≥20	Average≥100 Single≥81	255~430
8 1/8 ~ 1 1	≥690	≥100,000					

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.
Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

• NDE Inspection

Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
100% area of each non mag product has been penetrate tested within the whole length.

• Corrosion Resistance

-Intergranular Corrosion Test:
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.
- Stress Corrosion Resistance:
Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.
We can assure the layer of compressive residual stress can be measured even at 2mm deep. (API requires at 1mm deep)

• Chemical Composition

Steel Grade: PR140										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.03	≤1.00	18.50~ 23.00	≤0.040	≤0.01	16.50~ 20.00	2.00~ 3.00	3.00~ 4.00	0.50~ 0.80	≤0.10	≥34

• Mechanical Properties

Steel Grade: PR140							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8~8	≥965	≥140,000	≥1034	≥150,000	≥20	Average≥100 Single≥81	301~425
8 1/8~11	≥896	≥130,000					

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
The field gradient (Hot Spot) curve will be provided for each product.
Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

• NDE Inspection

Ultrasonic Test:
100% area of each non mag product has been ultrasonically tested within the whole length.
Penetrate Test:
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• Corrosion Resistance

-Intergranular Corrosion Test:
Resistance to Intergranular Corrosion Cracking: Each non mag forged bar has been tested according to ASTM A 262 latest version Practice A and Practice E.
- Stress Corrosion Resistance:
Henan Shenlong provides roller burnishing to the ID surface to create a uniform compressive layer which shows much more effective protection from SCC than shot peening does.
We can assure the layer of compressive residual stress can be measured even at 2mm deep. (API requires at 1mm deep)

• Chemical Composition

Steel Grade: PRU140										
C	Si	Mn	P	S	Cr	Mo	Ni	N	Nb	PRE
≤0.04	≤1.00	4.00~ 7.00	≤0.035	≤0.01	19.00~ 23.00	4.00~ 6.00	17.00~ 21.00	≥0.35	≤0.10	≥42

• Mechanical Properties

Steel Grade: PRU140							
OD Range in	Yield Strength Rp0.2		Tensile Strength Rm		Elongation A %	Impact Value Akv RT J	Hardness Brinell HB
	MPa	psi	MPa	psi			
3 1/8~ 8	≥965	≥140,000	≥1034	≥150,000	≥18	Average≥135 Single≥100	300~440
8 1/8~11	≥896	≥130,000					

• Magnetic Properties

Each non mag product is measured by Dr Foerster Magnetoscope to determine the relative magnetic permeability and the field gradient.
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Magnetic Properties requirements:
Relative Magnetic Permeability: ≤ 1.005
Field Gradient (Hot Spot): ±0.05 μT

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Add: No. 235, Yugong South Road, Tech Zone, Jiyuan, 459000, Henan, P.R. China
Tel: 86-391-6610618 Mobile: 86-13838932104
Web: www.petrodrillingtools.com
Email: 13838932104@163.com