

UGI® Slick

The “must-have”
for Slicklines in
the Oil & Gas industry



Ugitech

A long tradition of long products in Stainless Steels and Nickel Alloys

As a subsidiary of Swiss Steel Group, Ugitech is among the largest producers of Stainless Steel long products worldwide.

An integrated Research Centre – employing 50 specialist engineers and technicians – is dedicated to formulating tailor-made solutions to the requirements of our customers and their markets.

Ugitech has fully integrated production from steel making to final processing which enables total control of the quality and traceability of our products.

To ensure that surfaces are free of cracks Ugitech is using peeled wire rod and all Slicklines are 100% Eddy Current tested before delivery.

The expertise of Ugitech is well-known in the field of Slickline services and operations and Ugitech has an excellent reputation with all of the key OEMs in the Oil and Gas Industry.

Ugitech can offer a wide range of grades, including Austenitic Stainless Steels, Duplex and Super Duplex grades and Nickel or Cobalt based alloys.

Logistics: The strong worldwide network of Swiss Steel Group ensures that we are close to our customers wherever they are.

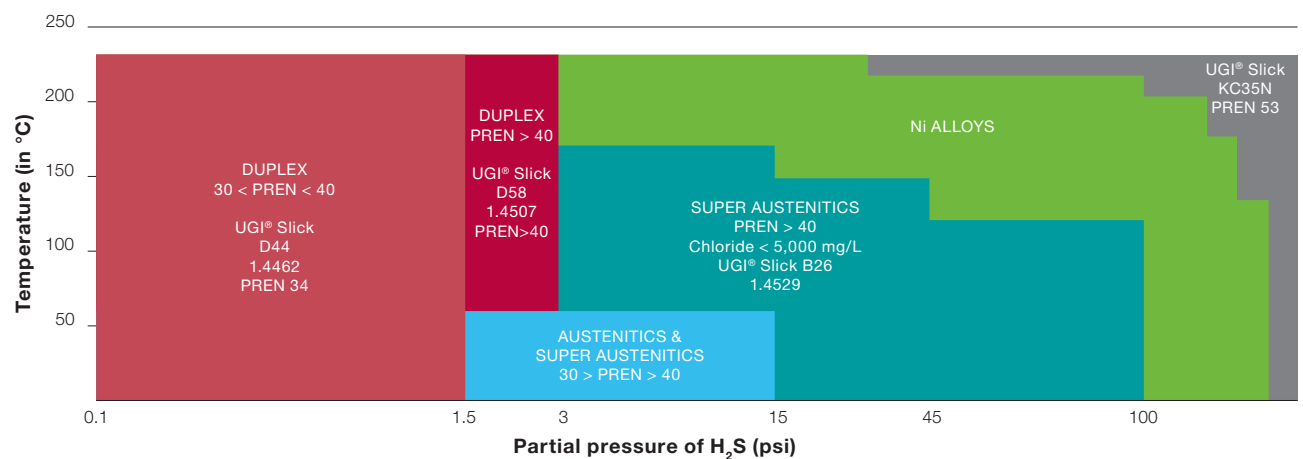
Stocks in finished sizes and lengths are held and are available in the Middle East and in Europe.

A specific grade for each type of well

Choosing a material for a slickline depends on:

- Local concentration of chloride, CO₂, H₂S,
- Downhole pressure and well temperature
- Chemical composition (PREN: Pitting Resistance Equivalent Number)

Graph based on NACE MR0175/ISO 15156 standard limits and internal laboratory results.



A wide range of grades

Ugitech provides the largest range of grades to match the conditions of each field and each application.

PREN 16= Cr+3.3xMo+16xN | PREN 30= Cr+3.3xMo+30xN

UGI® Slick KC35N

AISI -, EU (2.4999), UNS (R30035)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0,01	20	35	9,75	bal	<0,1	<0,1	-	<1
Tensile Strength ⁽¹⁾					295 ksi		2033 Mpa	
Young modulus					3,47 lb/in ²		235 Gpa	
Min PREN 16 (corrosion resistance)					52			
Min PREN 30 (corrosion resistance)					52			
Density					0,30lb/in ³		8,43 g/cm ³	
Thermal expansion ⁽²⁾					7,0 10 ⁻⁶ /°C		2,8 10 ⁻⁶ /°F	

UGI® Slick D58

AISI -, EU (1.4507), UNS (S32550)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0.03	25.3	6.3	3.5	-	0.4	1	0.2	bal
Tensile Strength ⁽¹⁾					234 ksi		1612 Mpa	
Young modulus					2,90 lb/in ²		200 Gpa	
Min PREN 16 (corrosion resistance)					40			
Min PREN 30 (corrosion resistance)					43			
Density					0,28 lb/in ³		7,85 g/cm ³	
Thermal expansion ⁽²⁾					7,4 10 ⁻⁶ /°C		13,5 10 ⁻⁶ /°F	

UGI® Slick B26

AISI 926, EU (1.4529), UNS (N08926)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0,015	20,3	24,6	6,2	-	0,3	0,8	0,15	bal
Tensile Strength ⁽¹⁾					236 ksi		1626 Mpa	
Young modulus					2,74 lb/in ²		185 Gpa	
Min PREN 16 (corrosion resistance)					42			
Min PREN 30 (corrosion resistance)					44			
Density					0,29 lb/in ³		8,03 g/cm ³	
Thermal expansion ⁽²⁾					8,9 10 ⁻⁶ /°C		16,1 10 ⁻⁶ /°F	

UGI® Slick D44

AISI -, EU (1.4462), UNS (S32205)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0.02	22.3	5.3	2.7	-	0.4	1	0.10	bal
Tensile Strength ⁽¹⁾					212 ksi		1461 Mpa	
Young modulus					2,90 lb/in ²		200 Gpa	
Min PREN 16 (corrosion resistance)					33			
Min PREN 30 (corrosion resistance)					34			
Density					0,28 lb/in ³		7,85 g/cm ³	
Thermal expansion ⁽²⁾					7,4 10 ⁻⁶ /°C		13,5 10 ⁻⁶ /°F	

UGI® Slick B29

AISI 316L, EU (1.4404), UNS (S31603)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0,02	16,7	10,2	2,1	-	0,5	1,4	-	bal
Tensile Strength ⁽¹⁾					200 ksi		1378 Mpa	
Young modulus					3,00 lb/in ²		207 Gpa	
Min PREN 16 (corrosion resistance)					24			
Min PREN 30 (corrosion resistance)					-			
Density					0,28 lb/in ³		7,85 g/cm ³	
Thermal expansion ⁽²⁾					9,1 10 ⁻⁶ /°C		16,5 10 ⁻⁶ /°F	

UGI® Slick D43

AISI -, EU (1.4362), UNS (S32304)

C	Cr	Ni	Mo	Co	Si	Mn	N	Fe
0,02	22,3	4,2	0,3	-	0,4	1	0,12	bal
Tensile Strength ⁽¹⁾					236 ksi		1626 Mpa	
Young modulus					3,00 lb/in ²		207 Gpa	
Min PREN 16 (corrosion resistance)					25			
Min PREN 30 (corrosion resistance)					27			
Density					0,28 lb/in ³		7,85 g/cm ³	
Thermal expansion ⁽²⁾					7,4 10 ⁻⁶ /°C		13,5 10 ⁻⁶ /°F	

¹
Diameter of 0.125 inches (or 3.18mm)

²
In the range of 68-210°F (20-100°C)

Product features

UGI® Slick B26

UNS (N08926) - EU (2.4999)

This grade is the historically known super austenitic grade for heavy duty line for sour service under 170°C. It resists sour media (H₂S partial pressure should not exceed 100 psi, CO₂ partial pressure should not exceed 500 psi). Fully austenitic, this grade has good resistance to pitting, crevice and stress corrosion cracking.

UGI® Slick B29

UNS (S31603) - EU (1.4404)

Austenitic stainless steel with good resistance to general corrosion. A cost effective choice in moderately corrosive environments. It can be used in humid or aqueous environments with limited chloride content (marine environment) and in many acidic environments (sulphuric, phosphoric, organic) under certain temperature and concentration conditions.

UGI® Slick D44

UNS (S32205) – EU (1.4462)

Resistant to sour media. Particularly recommended for medium sour wells when high mechanical performances (TS) are requested. Heavy duty line for extended sour service under 230°C. Good resistance to pitting and stress corrosion. Fatigue strength considerably higher than AISI 316 austenitic stainless steels.

UGI® Slick D43

UNS (S32304) - EU (1.4362)

Resistant to sulfide media. Particularly recommended for sweet and low severe sour wells when high performances - higher than UGI® Slick B29 are requested. Heavy duty line for extended sour service under 200°C. Very good resistance to pitting and stress corrosion.

UGI® Slick D58

UNS (S32550) – EU (1.4507)

Super duplex grade, in many points similar to UGI® Slick B26 in terms of resistance to pitting corrosion and crevice corrosion in extended sour service under 230°C.

Unaffected by stress corrosion cracking in chloride-bearing environments. Good resistance to intergranular corrosion.

UGI® Slick KC35N

UNS (R30035) – EU (2.4999)

Excellent corrosion resistance in all types of media. Very high mechanical properties. Can be used in extreme environments and at temperatures up to 400°C.

How to secure and specify the procurement of your slicklines

Work force and breaking load

The work force cannot exceed the breaking load given in the following tables. Ugitech recommends not to exceed 80% of the breaking load for the specified work force.

The stretch factor

Under load, a wireline will elongate (stretch) elastically. The following formula gives the slick line elongation: $S = F \cdot L \cdot (T + 0,5W)$

The following formula gives the read off length at spool, to reach a desired depth in the well.

Imperial units

- $L = 12 \cdot R / (12 + F \cdot (T + 0,5W))$
- Metric units
- $L = R / (1 + 0,001 \cdot F \cdot (T + 0,5W))$

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- S = Stretch in inch or mm
- F = Stretch factor, see table below
- L = Read off length, feet or kg
- W = Weight of wire in the well
- R = Desired depth read off line length + stretch
- T = Weight of tool

Example

- Stretch for a UGI® Slick D58 of 0,125"
- working at 8000 ft with a tool of 200 lb.
- $F = 33,7 \cdot 10^{-6}$ in/ft/lb
- L = 8000 ft
- T = 200 lb
- W = 334 lbf
- Stretch = 99 inches

UGI® Slick KC35N

AISI -, EU (2.4999), UNS (R30035)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	2060	9180	24.3	11.0	52.9	30000
0.108 (2.74)	2750	12240	33.5	15.2	38.4	20000
0.125 (3.18)	3620	16110	44.8	20.3	28.7	15000
0.14 (3.56)	4470	19860	56.3	25.5	22.9	on request
0.16 (4.06)	5830	25950	73.5	33.3	17.5	on request

UGI® Slick D58

AISI -, EU (1.4507), UNS (S32550)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	1690	7520	22.6	10.3	62.2	30000
0.108 (2.74)	2197	9773	31.2	14.1	45.2	30000
0.125 (3.18)	2870	12780	41.8	18.9	33.7	30000
0.14 (3.56)	3290	14640	52.4	23.8	26.9	30000
0.16 (4.06)	4500	2020	68.4	31.0	20.6	25000

UGI® Slick B26

AISI 926, EU (1.4529), UNS (N08926)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	1627	7240	23.1	10.5	67.2	30000
0.108 (2.74)	2242	9977	31.9	14.5	48.8	30000
0.125 (3.18)	2874	12874	42.7	19.4	36.4	30000
0.14 (3.56)	3461	15396	53.6	24.3	29	30000
0.16 (4.06)	4300	19126	70.0	31.7	22.2	25000

UGI® Slick D44

AISI -, EU (1.4462), UNS (S32205)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	1500	6678	22.6	10.3	62.2	30000
0.108 (2.74)	2050	9122	31.2	14.1	45.2	30000
0.125 (3.18)	2587	11520	41.8	18.9	33.7	30000
0.14 (3.56)	3230	14370	52.4	23.8	26.9	30000
0.16 (4.06)	4078	18143	68.4	31.0	20.6	25000

UGI® Slick D43

AISI -, EU (1.4362), UNS (S32304)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	1700	7565	22.6	10.3	62.2	30000
0.108 (2.74)	2380	10588	31.2	14.1	45.2	30000
0.125 (3.18)	2900	12874	41.8	18.9	33.7	30000
0.14 (3.56)	3500	15533	52.4	23.8	26.9	30000
0.16 (4.06)	4550	20199	68.4	31.0	20.6	25000

UGI® Slick B29

AISI 316L, EU (1.4404), UNS (S31603)

Diameter Inches (mm)	Breaking Load*		Weight		Stretch Factor	Maximum Length** ft
	lbf	N	lb/1000 ft	Kg/1000 ft		
0.092 (2.34)	1400	6235	22.6	10.3	62.2	30000
0.108 (2.74)	1831	8144	31.2	14.1	45.2	30000
0.125 (3.18)	2500	10910	41.8	18.9	33.7	30000
0.14 (3.56)	3150	14028	52.4	23.8	26.9	30000
0.16 (4.06)	4100	18233	68.4	31.0	20.6	25000

* Values are minimum breaking loads based on nominal diameter. With all slickline the achieved breaking load is mentioned on the material certificate.

** For longer line please ask our technical team

How to extend the life of slicklines

The life of slicklines is not only dependent upon the choice of grade: incorrect use could drastically affect its life cycle and damage its performance.

Sheave Pulley Diameter

The right determination of the diameter of the top pulley is a key factor. A wrong choice could cause breakages by stress fatigue.

Ugitech recommends a strict and full respect of the value pre-specified to guarantee good progress during the fishing operation.

Packaging

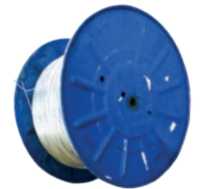
Metallic spools are specially designed for ease of handling, storage and safe running of your coiling operation. Ugitech takes particular care of the coiling settings during production, the helix, cast and tangling parameters have been specified to avoid too high tension during your own spooling operation which could damage the workability of the wire.

Minimum sheave diameter

Wire diameter inch	0.092	0.105	0.108	0.125	0.14	0.15	0.16
Min. sheave diameter inch	13	15	15	17	20	21	22

Scheme of T4 type reel

- Maximum weight per reel = 500 kg
- External diameter 760 mm
- Width 450 mm
- Bore 70.5 mm



Scheme of T10 type reel

- Maximum weight pr reel = 1,000 kg
- External diameter 900 mm
- Width 655 mm
- Bore 127 mm



Type of spools

Slick line longer than 30000ft are available on request for Ø0.092/0.108/0.125 inch.

For grades UGI® Slick: D58 – B26 – D44 – B29 – D43 – KC35N

Diameter (in)	Length (ft)					
	15000	18000	20000	22000	25000	30000
0.092	T4	T4	T4	T4	T4	T4
0.108	T4	T4	T4	T4	T4	T4
0.125	T4	T4	T4	T4	T4	T10
0.14	T4	T4	T4	T10	T10	T10
0.16	T4	T10	T10	T10	T10	NA*

For UGI Slick KC35N see the maximum length on page 5

*NA: Non Available

Quality assurance

Ugitech R&D Center is equipped to:

- Test the Sulfide Stress Cracking (SSC) resistance of long products following the NACE TM 0177 standard.
- Test the Critical Pitting Temperature (CPT) following the ASTM G48, ASTM A923 and ASTM G150 standards.

Manufacturing according to API-9A, in applicable parts.

Tests on Ugitech Slicklines:

- Ductility :Torsion tests and wrapping tests
- Tensile strength (breaking load)
- Positive Material Identification

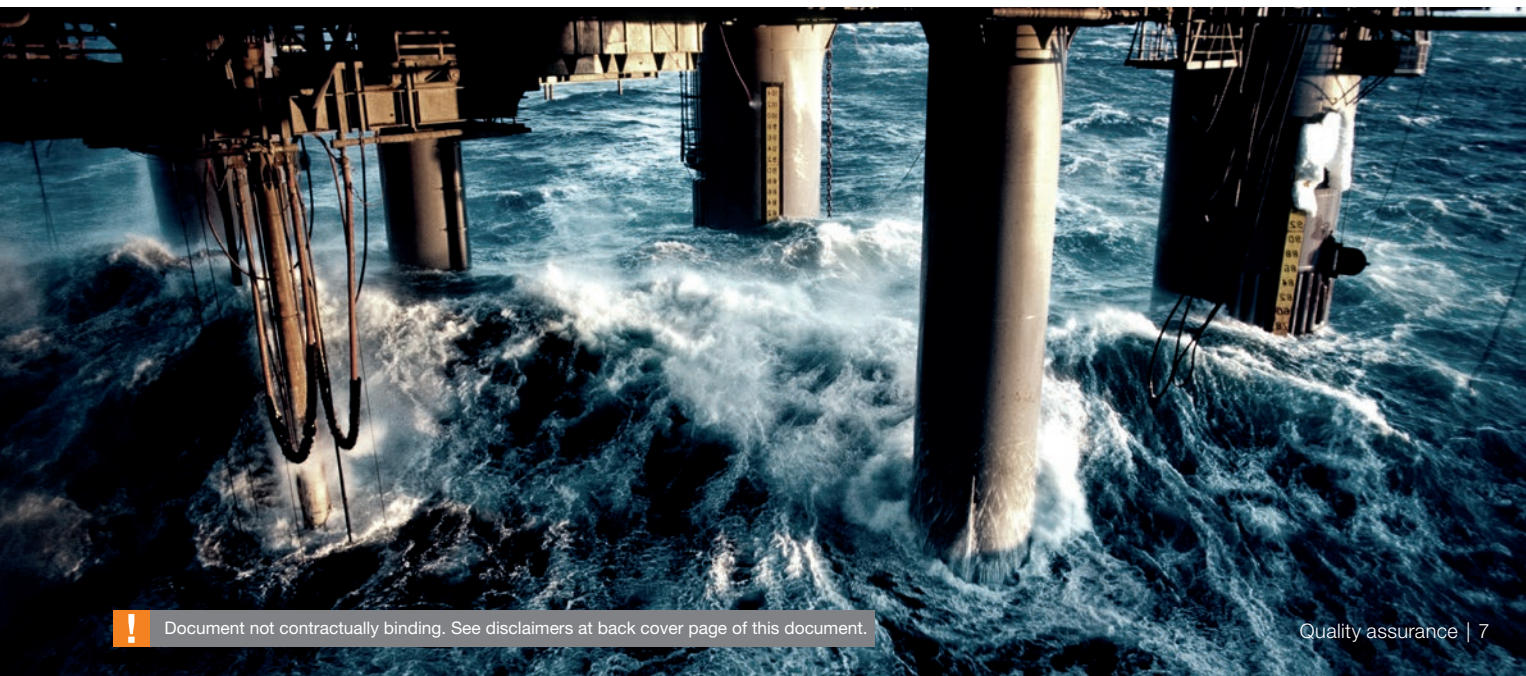
Conversion tables

- 1 lb = 0.4536 kg
- 1 ksi = 6.89 Mpa
- 1 ft = 0.3048 m
- 1 in = 0.0254 m
- 1 lbf = 4.4482 N
- 1 °F = 32 + °C x 9/5
- 1 °C = 5/9 (°F-32)
- 1 kg/cm² = 14.22 psi
- 1 MPa = 1N/mm² = 145.04 psi
- 1 atm (atmosphere) = 1.01 bar
- 1 atm (atmosphere) = 1.03 kg/cm²

Environment, health and safety

Ugitech quality system is approved by accredited third party to ISO 9001 valid for all products.

Ugitech is also approved by accredited third party to ISO 1400.





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