DIRECTIONAL DRILLING SERVICES
Integral Blades Stabilizers Brochures

TLOS – Stabilizers

a. Integral Blade Stabilizers with Thread and Hardfacing

The Stabilizer manufactured for TLOS designed to fit with the Directional Drilling Services. Only Integral Stabilizer has been chosen to build on the deviated String

The body is made of modified alloy steel, and fully heat treated for prospective hardness, strength and impact strength.

Through ultrasonic testing and magnetic testing, it is proved up to flowing grade.

Material: 40CrMnMo(4145H)
Hardness: HB290-340
Strength: b b≥965 Mpa (D2＜160mm) b b≥931 Mpa (D2＞160mm)
Impact strength: AK≥54J

Stabilizer Chemical Properties

Grad	C	Mn	Si	P	S	Cr	Cr	Cu	Ni	Ai	Mo
AISI 4145H	0.42 – 0.49	0.90 – 1.25	0.15 – 0.35	≤0.025	≤0.020	0.95 – 1.35	0.20 – 0.35	≤0.035	≤0.025	≤0.050	0.15 – 0.25

The connections are up to API standard which have stress relief grooves and are cold rolled. The flank of thread is phosphatized or plated copper, coated with thread dope and equipped with thread protectors.

It is mainly the spiral blades (usually three blades), which rub against the borehole wall. The working surface of the blades is hard faced. It is preferred operation that tungsten carbide inserts are cold inserted into the working surface of blades including its bevels. Braze welding tungsten carbide grains are also adopted according to customers require.

The mechanical performances of the stabilizer are complied with API Spec.7.

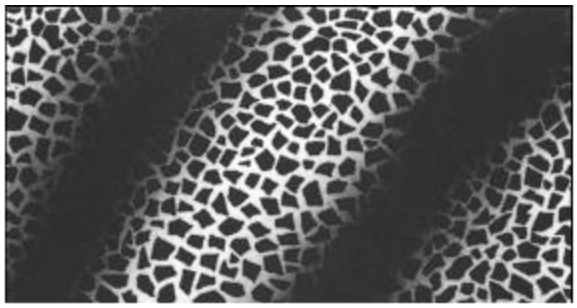
b. Integral Straight/Spiral Blades Stabilizer

Based on the installation place, this stabilizer can be divided into two types: String type and Near-bit type. Built with inserted round carbide in spiral ribs, the product is outstanding by its high hardness, good toughness and powerful wear resistance, as well as its long service life.

HARDFACING TYPE (Integral Stabilizer & Integral Mandrel Sleeve Stabilizer)

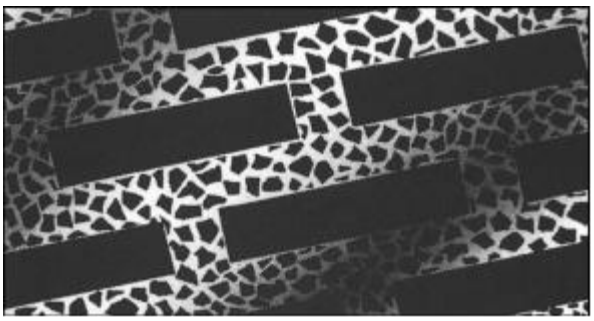
HF 1000

Crushed tungsten carbide held in a nickel bronze matrix. The 3 mm grain size ensures greater concentration of carbide which is ideal for soft formation drilling.



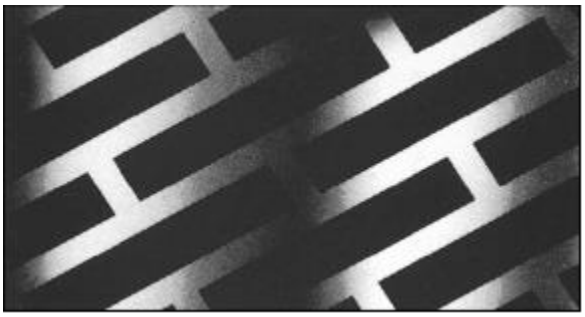
HF 2000

Trapezoidal tungsten carbide inserts held in a sintered carbide nickel bronze matrix. This will give a greater depth of carbide coverage – ideal for high deviation drilling in abrasive formations. HF



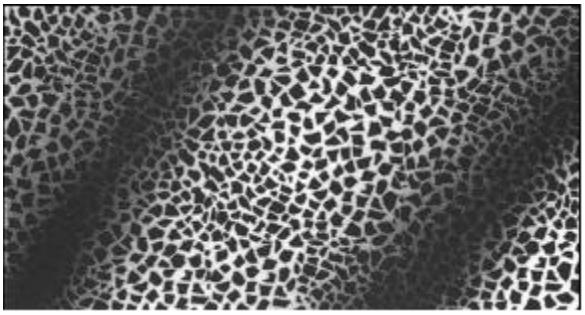
HF 3000

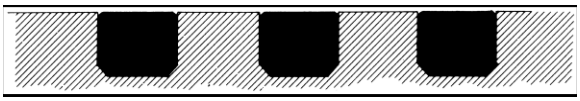
Tungsten carbide inserts set in a powder spray deposit ideal for abrasive formations. 97% bonding guaranteed, certified by ultrasonic report. Recommended for non- magnetic stabilizers.



HF 4000

Tungsten carbide inserts (button type). The inserts have been developed to allow cold insertion and maintain close fit. A greater concentration of inserts on the bottom third of the blade and leading edge will increase surface contact to reduce wear in highly abrasive formations. HF





HF 5000

This oxy-acetylene process applies tough molten carbide particles of varying sizes held in a nickel chrome matrix which provides excellent bonding properties and greater surface wear characteristics are achieved. Surface hardness levels over 40 HRC. Ideal for GEO-THERMAL applications over 350°

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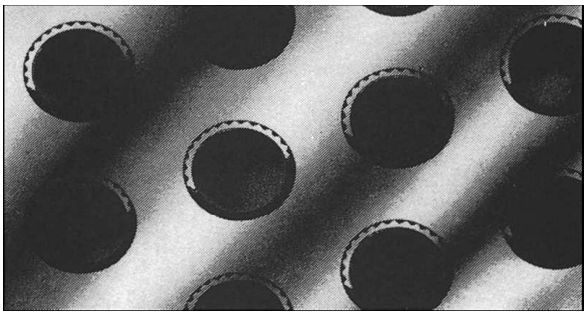
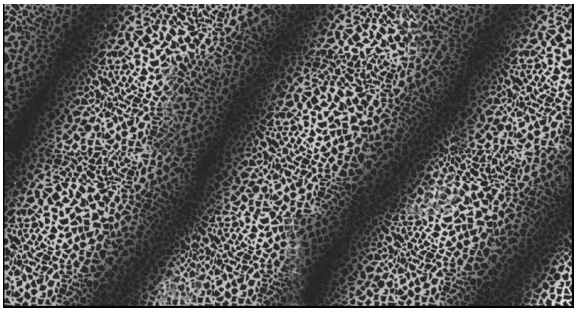
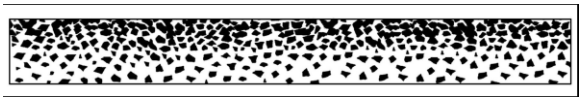


HF 6000

This process is a highly automated way of applying hard face and utilizes a combined arc/plasma stream on the work piece surface. This result is low base metal dilution and a dense, uniform coating, the filling medium can be variety of hardfacing consumables.





TLOS Integral Blade Stabilizer Specifications

Size	D in	D1 In	D2 in	..d in	L in	L1 in	L2 in	B in	Total Length in	Spiral Angle	Conn 1	Conn 2	Type
26”	26	9.5	11.34	3	92.125	35.35	20	4	104.33	45	7 5/8 Reg	7 5/8 Reg	ST NB
23”	23	9.5	11.34	3	92.125	35.35	20	4	104.33	45	7 5/8 Reg	7 5/8 Reg	ST NB
22”	22	9.5	11.34	3	92.125	35.35	20	4	104.33	45	7 5/8 Reg	7 5/8 Reg	ST NB
17 ½”	17.5	9.5	11.34	3	92.125	30	18.11	4	104.33	29	7 5/8 Reg	7 5/8 Reg	ST NB
17	17	9.5	11.34	3	92.125	30	18.11	4	104.33	29	7 5/8 Reg	7 5/8 Reg	ST NB

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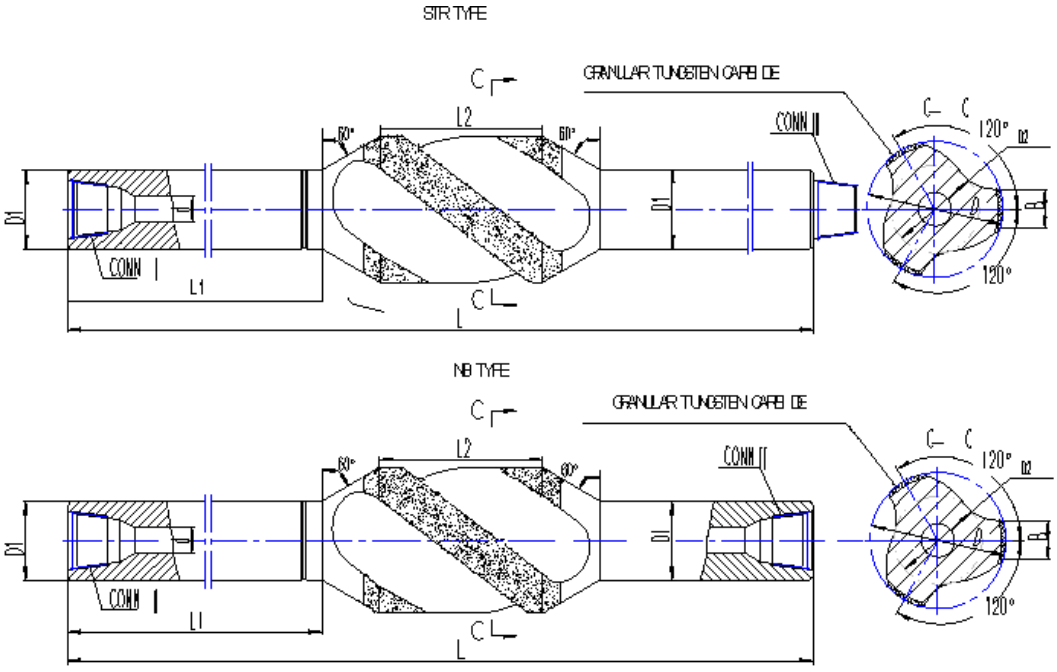
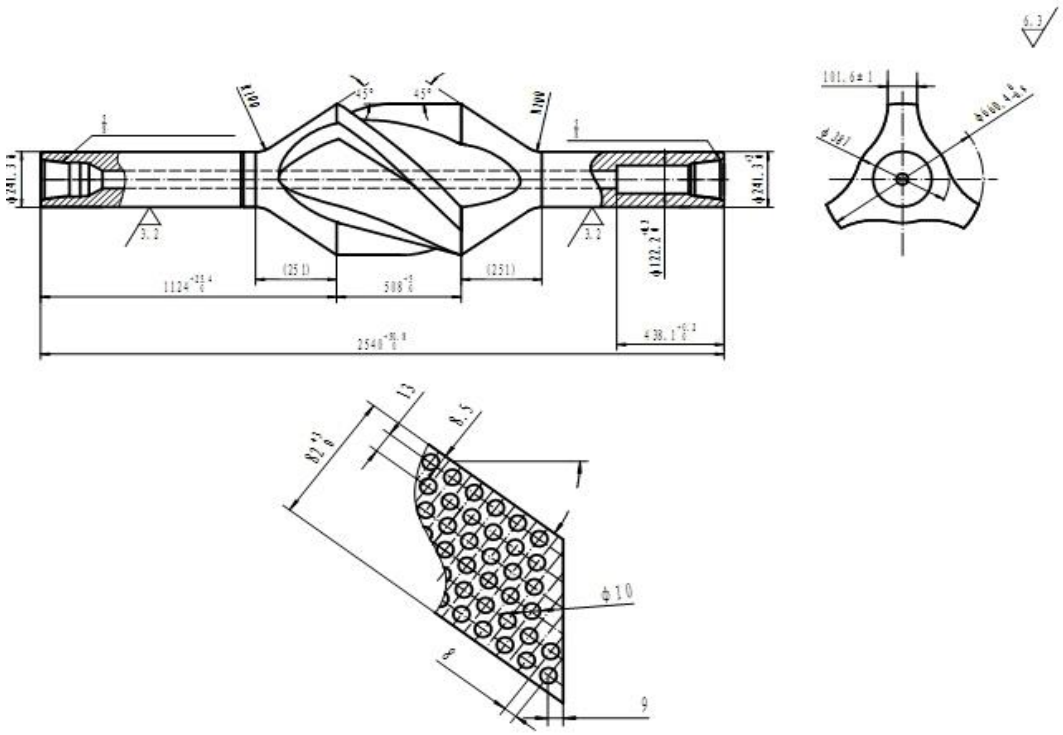
16”	16	8	10.24	2.8	92.125	30	18.11	4	104.33	26	6 5/8 Reg	6 5/8 Reg	ST NB
14 ¾”	14.75	8	10.24	2.8	92.125	30	18.11	4	104.33	24	6 5/8 Reg	6 5/8 Reg	ST NB
12 ¼”	12.25	8	8	2.8	83	30	18.11	3.5	104.33	20	6 5/8 Reg	6 5/8 Reg	ST NB
12	12	8	8	2.8	83	30	18.11	3.5	104.33	20	6 5/8 Reg	6 5/8 Reg	ST NB
8 ½”	8.5	6.75	6.73	2.8	75	28	16.14	2.56	98.4	15	4 ½ IF	4 ½ IF 4 ½ Reg	ST NB
7 ¾”	7.75	6.5	6.73	2.8	75	28	16.14	2.56	98.4	15	4 ½ IF	4 ½ IF 4 ½ Reg	ST NB
7 ½”	7.5	6.5	6.73	2.8	75	28	16.14	2.56	98.4	15	4 ½ IF	4 ½ IF 4 ½ Reg	ST NB
6”	6	4.75	4.75	2.25	64	24	14.17	2	98.4	11	3 ½ IF	3 ½ IF	ST NB
5 ¼”	5.25	4.75	4.75	2.25	64	24	14.17	2	98.4	11	3 ½ IF	3 ½ IF	ST NB
4 1/8”	4.125	3.5	3.5	2	64	24	14.17	2	98.4	11	3 ½ IF	3 ½ IF	ST NB

Stabilizer Dimension & Drawing Design

TLOS has created it is own design to fit with the high and Low angle well wells to max. Possible smoothing well path with minimum accordance of hole drags.



TLOS I.B. Stabilizer



c. ANDERGAUGE Adjustable Gauge Stabilizer

Inclination control is the main reason for directional correction in deviated wells and selection of the bottom hole assembly stabilization is critical. With a rotary assembly the wrong initial selection will result in a round trip and, even with motor based assembly, the amount of oriented drilling will increase significantly; thereby reducing ROP.

A simple mechanical activation, positive hydraulic lock and surface pressure indication ensure simple operation and proven reliability.

Andergauge Features

- Robust engineering providing solid reliability
- ½”, ¾” and 1” gauge change
- Comprehensive database to assist BHA selection
- Positive locking mechanism maintains set selection
- Mechanical activation ensures positive gauge selection
- Clear surface pressure indication of reliable downhole setting
- Rotary correction trends reduce doglegs and reduce torque and drag
- Optimized steerable assembly rotary efficiency
- Continuous rotation improves hole cleaning and cutting bed disturbance

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Andergauge Application

- Rotary String for tangent and horizontal sections
- Rotary Near bit for tangent / “S” profiles
- Rotary Near bit for more aggressive horizontal response
- Above motor placement for tangent / “S” profiles and horizontal sections
- Below motor placement for horizontal sections

Mechanical Ander gauge Specification

Hole Size	6”	6 3/8”	7 7/8”	8 ½”	9 7/8”	10 5/8”	12 ¼”	14 ¾”	16”	17 ¼”	17 ½”
Min. Setting	5 5/8”	6”	7 ¾”	7 ¾”	9 1/8”	9 7/8”	11 ½”	13 ¾”	15 ¼”	15 7/8	16 ¾”
Max. Setting	6”	6 3/8”	7 7/8”	8 ½”	9 7/8”	10 5/8”	12 ¼”	14 ¾”	16”	17 ¼	17 ½”
Overall Length	87”	87”	104”	119”	108”	108”	117”	139”	151”	156”	151”
ID	1 ¼”	1 ¼”	1 ¾”	1 ½”	1 5/8”	1 5/8”	2”	2.5”	3”	3”	3”
Weight (lbs)	670	670	925	1000	1100	1100	1925	2850	3750	4000	3750
Flow Range (gpm)	120/350	120/350	250/550	300/800	350/800	350/800	500/1200	750/1300	700/1500	700/1500	700/1500
Fishing Neck dia	4 ¾”	4 ¾”	6 ¾”	6 ¾”	7 ½”	8”	8 ¼”	9 5/8”	9 ½”	9 ½”	9 ½”
Operating Temperature	Standard 310°F / Max 400°F										
Signal (psi)	150 – 250 psi Recommended										
Blade Cover	360°C Right Hand Spiral										
Blade Dressing	Brick Pattern Tungsten Inserts										
Blade Length	15”	15”	16”	20”	17”	17”	20”	27”	32”	34”	32”
Number of Pistons	15	15	15	15	15	15	18	18	18	18	18
Standard Connections	3 ½” IF	3 ½” IF	4 ½” IF	4 ½” IF	5 ½” Reg	6 5/8” Reg	6 5/8” Reg	7 5/8” Reg	7 5/8” Reg	7 5/8” Reg	7 5/8” Reg

Hydraulic Ander gauge Specification

Hole Size	6”	6 1/8”	6 ½”	8 ½”	9 7/8”	12 ¼”
Min. Setting	5 ½”	5 5/8”	6”	7 ¾”	9”	11 ¼”
Max. Setting	6”	6 1/8”	6 ½”	8 ½”	9 7/8”	12 ¼”
Overall Length	100”	100”	104”	111”	141”	136”
ID	1 ¼”	1 ¼”	1 ¼”	1 ¼”	1 7/8”	2”
Weight (lbs)	660	660	660	750	1600	2000
Flow Range (gpm)	170/350	170/350	170/350	350/700	500/950	500/1100
Fishing Neck dia	4 ¾”	4 ¾”	4 ¾”	7”	8”	9 ½”
Operating Temperature	Standard 320°F / Max 400°F					
Signal (psi)	150 – 250 psi Recommended					
Blade Cover	360°C Right Hand Spiral					
Blade Dressing	Brick Pattern Tungsten Inserts					
Blade Length	21”	21”	21”	23”	23 ½”	23 ¾”
Number of Pistons	15	15	15	15	18	15
Standard Connections	3 ½” IF	3 ½” IF/REG	3 ½” IF/REG	4 ½” IF/REG	6 5/8” REG 4 ½” IF	6 5/8” REG 7 5/8” IF

d. AISI 4145HMOD TURBO BACK STABILIZER

Specifications

1. Hole sizes range: 6"to36”
2. Type: string, near bit
3 Forge + spiral +API connection + hard facing

1. Raw material: AISI4145H MOD

The Technique Requirement of 4145H Steel

Chemical Composition	Contents
C	0.42-0.49
Si	0.15-0.35
Mn	0.75-1.15
P	≤0.025
S	≤0.025
Cr	0.75-1.25
Mo	0.20-0.35
Cu	≤0.35

2: Melting process: EAF+LF+VD
3. Quality: API SPEC7-1 & ISO
4. Delivery time: according to the order
5: Dimensions:

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STANDARD STABILIZER SIZES:

HOLE SIZE	BODY OD.	FISHING NECKLENGTH	BLADE LENGTH	BLADE WIDTH	TONG SPACE	BORE	LENGTH
8	43/4	30	15	3	25	21/4	72
81/2	61/2	30	18	3	27	213/16	78
121/4	8	30	18	31/2	28	213/16	83
121/4	91/2	30	18	31/2	28	3	83
143/4	8	30	18	31/2	30	213/16	90
143/4	91/2	30	18	31/2	30	3	90
16	91/2	30	18	31/2	30	3	92
171/2	8	30	20	31/2	30	213/16	94
171/2	91/2	30	20	31/2	30	3	94
20-26	91/2-11	30	22	4	30	3	110

Mechanical properties (1” below surface at normal temperature)

Yield Strength:	110Mpa Min (0.2% offset)
Tensile Strength	140MpaMin
Elongation	13% Min
Reduction of Area	45% Min
Impact Strength (Charpy V)	54 Min
Hardness	285HB Min

Test: · UT&MT test according to ASTM A-388 to guarantee high quality.
Chemical composition & mechanical properties test according to the customers’ requirement

Packing type: packed with iron selves in nude or in plastic bags,
Our company has complete production lines for metalworking: forging, heat treatment, and finish machining.

Service:

Stabilizer forgings with black surface/peeled

Stabilizer forgings after heat treatment (with hole or not)

Stabilizer with spiral machining

Stabilizer with spiral &hard surface machining

Stabilizer with spiral &hard surface &connection machining