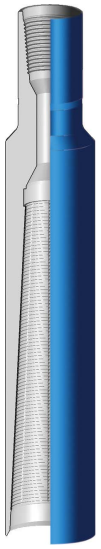


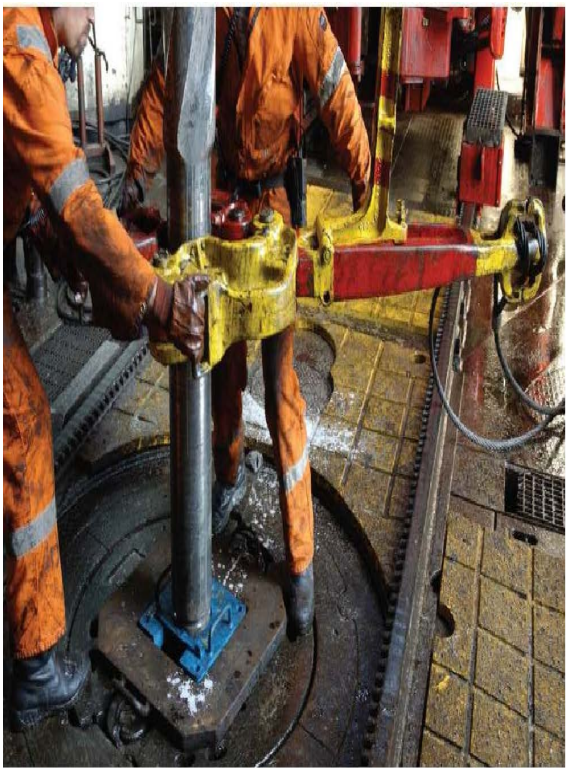
ERA

ERA OILFIELD SERVICES

DRILL STEM and FISHING TOOLS CATALOGUE 2015

ERA - FISHING AND TOOLS RANGE

ERA Oilfield Services provides a comprehensive range of quality fishing and drill string products,



Manufactured and designed in conjunction with Tianhe Huifeng Oil Group under our strict quality control regimen from initial materials selection to final inspection, we ensure that all drill stem and fishing components meet your needs for durability and performance.

All products are manaufactured to API, ISO and NS1 procedural and quality standards. All products are field proven and are utilised globally.

We bring not only quality in construction and reliability in design, but also quality in our approach to your downhole, project and business objectives.

At ERA we provide off the shelf designs for your big hole, coil or wireline requirements as well as bespoke tool design input to suit your specific downhole problem.

Whether its drill pipe, collars, subs, stabilisers, a packer milling assembly with catchers and collets, mills and bits, casing scrapers or cutters we can do it faster, more efficiently and with better quality than anyone else.

For more information contact us:

Head Office: ERA Oilfield Service (Thailand) Co Ltd., 23rd Floor, Pacific Place 2, 142 Sukhumvit Road, Klong Toey, Bangkok. 10110.

Tel:	**+66 (0) 2 684 6966**	**Bangkok Office**
	+66 (0) 8 4345 8730	**24 hour mobile**
Email:	**Fishing Tools**	**jim.reid@eraoilfieldservices.com**
		par@eraoilfieldservices.com
		downholetools@eraoilfieldservices.com
	General Enquiries	**jim.reid@eraoilfieldservices.com**

CERTIFICATION AND QUALIFICATION

Certificate of Authority to use the Official API Monogram
License Number: 5CT-0655 ORIGINAL

The American Petroleum Institute hereby grants to

TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, No. 1 Committee
Xinhua North
Hailin City, Heilongjiang
People's Republic of China

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 5CT** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: **5CT-0655**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: **Manufacturer of Casing or Tubing Couplings at Groups 1 and 3, J55/PSL 1, N80(1)/PSL 1, P110/PSL 1**

QMS Exclusions:

American Petroleum Institute

Certificate of Authority to use the Official API Monogram
License Number: 7-1-0396 ORIGINAL

The American Petroleum Institute hereby grants to

TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, No. 1 Committee
Xinhua North
Hailin City, Heilongjiang
People's Republic of China

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 7-1** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: **7-1-0396**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following products: Kelly Valves; Kellys; Drill Stem Subs; Drill Collars; Heavy Weight Drill Pipe; Threading for Rotary Shouldered Connections

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

American Petroleum Institute

Certificate of Authority to use the Official API Monogram
License Number: 5DP-0048 ORIGINAL

The American Petroleum Institute hereby grants to

TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, No. 1 Committee
Xinhua North
Hailin City, Heilongjiang
People's Republic of China

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 5DP** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: **5DP-0048**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following product: **Tool Joint:** PSL 1, 2 and 3

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

American Petroleum Institute

Effective Date: JUNE 28, 2011
Expiration Date: JUNE 28, 2014

To verify the authenticity of this license, go to www.api.org/compositelist.

Director of Global Industry Services

Fearnley Procter

NS-1™ FACILITY LEVEL 5

FACILITY APPROVAL

Tianhe Oil Group Huifeng Petroleum Equipment Co. Ltd.
No. 101, Committee 1, Xinhua Bei, Hailing City, Mudanjiang, Heilongjiang, P.R.C.

Fearnley Procter certify that the above company's Quality Management System has been assessed and found compliant with

ISO/TS29001:2010
(Petroleum, Petrochemical and Natural Gas Industries — Sector-specific Quality Management Systems Requirements for Product and Service Supply Organizations)
&
Fearnley Procter NS-1™ Quality and Inspection Requirements for New and Refurbished Drilling and Well Completion Equipment.

SCOPE:	**Product/Service/Process**
Drill Collars NS.03.38.10.1110	Heat Treatment, Machining, Threading Inspection & Testing.
HWDP (Integral) NS.03.30.80.1120	Heat Treatment, Machining, Threading, Inspection & Testing.
Non Welded Kellies NS.03.36.12.1110	Heat Treatment, Machining, Threading, Inspection & Testing.
Stabilizers Integral/Replaceable Blade NS.03.38.82.1110	Heat Treatment, Machining, Threading, Inspection & Testing.

CONDITIONS:
1. All processing performed at the above facility.

EXCLUSIONS:
1. ISO/TS 29001: Section 7.3 Design & Development.

Issued By
Kevin Fearnley
Chairman NS-1™ Technical Review Committee

Review No	**: FP FZE 486**
Certificate No	**: 0058/12-5**
Approval Date	**: 13th June, 2012**
Valid Till	**: 12th June, 2013**
Registered Since	**: 5th November, 2010**

To maintain validity during the said period the above named Company must fully comply with the current requirements of ISO/TS29001 and **Fearnley Procter NS-1™** Quality and Inspection Requirements for New and Refurbished Drilling and Well Completion Equipment latest revisions. Certificates can be verified at Fearnley Procter Website www.fearnleyprocternsm.com

NAC

CERTIFICATE OF CONFORMITY OF ENVIRONMENTAL MANAGEMENT SYSTEM
NO. 01013E10019ROM

This is to certify that the environmental management system of
TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, NO 1 COMMITTEE, XINHUA NORTH, HAILIN CITY, MUDANJIANG CITY, HEILONGJIANG PROVINCE
POSTCODE: 157100
Is in conformity with the standard
GB/T 24001-2004 idt ISO14001:2004
The Environmental Management System applies in the following area:
DRILLING TOOL, CORING TOOL, CEMENTING TOOLS, DOWN HOLE TOOLS, ACCIDENT TREATMENT TOOL; PIPELINE VALVE (LICENSE REQUIPMENTS EXCEPT PRODUCTS), DRILLING AND OPERATING EQUIPMENT DESIGN AND DEVELOPMENT AND PRODUCTION AND RELATIVE ACTIVITIES AND LOCATIONS
Term of validity of this certificate from FEB 04, 2013 to FEB 03, 2016 inclusive
Northeast Audit Co., Ltd.
NO. 21-1 WENYI ROAD, SHENHE DISTRICT, SHENYANG CITY, LIAONING PROVINCE
Surveillance audits should not exceed 12 months The certificate is invalid without attaching labels on schedule
General Manager
Date: 02/04/2013

CNAS MANAGEMENT SYSTEM CNAS C010-E
IAF

NAC

CERTIFICATE OF CONFORMITY OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
NO: 01013S10013ROM

This is to certify that the occupational health and safety management system of
TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, NO 1 COMMITTEE, XINHUA NORTH, HAILIN CITY, MUDANJIANG CITY, HEILONGJIANG PROVINCE
POSTCODE: 157100
Is in conformity with the standard
GB/T28001-2011
The scope of activities covered by this certificate are defined as below:
DRILLING TOOL, CORING TOOL, CEMENTING TOOLS, DOWN HOLE TOOLS, ACCIDENT TREATMENT TOOL; PIPELINE VALVE (LICENSE REQUIPMENTS EXCEPT PRODUCTS), DRILLING AND OPERATING EQUIPMENT DESIGN AND DEVELOPMENT AND PRODUCTION AND RELATIVE ACTIVITIES AND LOCATIONS
Term of validity of this certificate: from FEB 04, 2013 to FEB 03, 2016 inclusive
Northeast Audit Co.,Ltd.
NO. 21-1 WENYI ROAD, SHENHE DISTRICT, SHENYANG CITY, LIAONING PROVINCE
Surveillance audits should not exceed 12 months The certificate is invalid without attaching labels on schedule
General Manager:
Date: 02/04/2013

CNAS MANAGEMENT SYSTEM CNAS C010-S

NAC

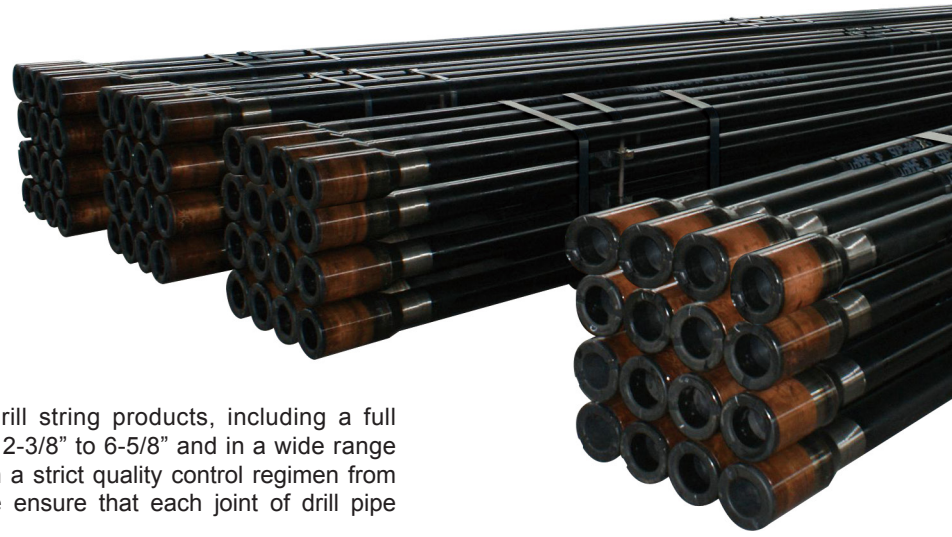
CERTIFICATE OF CONFORMITY OF QUALITY MANAGEMENT SYSTEM
NO. 01010Q10521ROM

This is to certify that the quality management system of
TIANHE OIL GROUP HUIFENG PETROLEUM EQUIPMENT CO., LTD.
101, NO 1 COMMITTEE, XINHUA NORTH, HAILIN CITY, HEILONGJIANG PROVINCE
POSTCODE: 157011
Is in conformity with
GB/T 19001-2008 / ISO 9001:2008 Standard
The scope of activities covered by this certificate are defined below:
DESIGN, DEVELOPMENT AND PRODUCTION OF DRILLING TOOLS, CORING TOOLS, CEMENTING TOOLS, WELL-BOTTOM ACCIDENT SHOTTING TOOLS, PIPELINE VALVES (LICENSE REQUIREMENTS EXCEPT PRODUCTS) AND EQUIPMENT FOR SURFACE OPERATION
Term of validity of this certificate: from DEC 02, 2010 to DEC 01, 2013 inclusive
Northeast Audit Co., Ltd.
NO. 21-1 WENYI ROAD, SHENHE DISTRICT, SHENYANG CITY, LIAONING PROVINCE
Surveillance audits should not exceed 12 months The certificate is invalid without attaching labels on schedule
General Manager
Certificate Issue-Change Date:02/04/2013

CNAS MANAGEMENT SYSTEM CNAS C010-Q
IAF

INDEX

DRILL PIPE

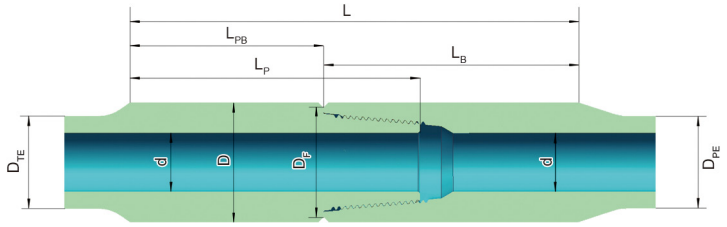


ERA / TIANHE provides a complete line of drill string products, including a full range of jointed drill pipe in nominal sizes from 2-3/8" to 6-5/8" and in a wide range of wall thicknesses. Drill pipe manufactured with a strict quality control regimen from initial materials selection to final inspection, we ensure that each joint of drill pipe meets your needs for durability and performance.

Specifications - Drill Pipe

Size	Product Code	Weight Designation	Plain-End Weight Wpe		Outside Diameter D		Wall thickness T		Grade	Upset Ends,for weld-on tool joints
			lb/ft		kg/m		in	mm		
2 3/8	Z09-01000	6.65	6.27	9.33	2.375	60.3	0.28	7.11	E, X, G, S	Ext.Upset
2 7/8	Z09-02000	10.4	9.72	14.47	2.875	73	0.362	9.19	E, X, G, S	Int.Upset or Ext.Upset
3 1/2	Z09-03000	9.5	8.81	13.12	3.5	88.9	0.254	6.45	E	Int.Upset or Ext.Upset
3 1/2	Z09-03001	13.3	12.32	18.34	3.5	88.9	0.368	9.35	E, X, G, S	Int.Upset or Ext.Upset
3 1/2	Z09-03002	15.5	14.64	21.79	3.5	88.9	0.449	11.4	E	Int.Upset or Ext.Upset
3 1/2	Z09-03003	15.5	14.64	21.79	3.5	88.9	0.449	11.4	X, G, S	Ext.Upset or Int.-Ext.Upset
4	Z09-04000	14	12.95	19.27	4	101.6	0.33	8.38	E, X, G, S	Int.Upset or Ext.Upset
4 1/2	Z09-05000	13.75	12.25	18.23	4.5	114.3	0.271	6.88	E	Int.Upset or Ext.Upset
4 1/2	Z09-05001	16.6	15	22.32	4.5	114.3	0.337	8.56	E, X, G, S	Ext.Upset or Int.-Ext.Upset
4 1/2	Z09-05002	20	18.71	27.84	4.5	114.3	0.43	10.92	E, X, G, S	Ext.Upset or Int.-Ext.Upset
5	Z09-06000	16.25	14.88	22.16	5	127	0.296	7.52	X, G, S	Int.Upset
5	Z09-06001	19.5	17.95	26.7	5	127	0.362	9.19	E	Int.-Ext.Upset
5	Z09-06002	19.5	17.95	26.7	5	127	0.362	9.19	X, G, S	Ext.Upset or Int.-Ext.Upset
5	Z09-06003	25.6	24.05	35.8	5	127	0.5	12.7	E	Int.-Ext.Upset
5	Z09-06004	25.6	24.05	35.8	5	127	0.5	12.7	X, G, S	Ext.Upset or Int.-Ext.Upset
5 1/2	Z09-07000	21.9	19.83	29.52	5.5	139.7	0.361	9.17	E, X, G, S	Int.-Ext.Upset
5 1/2	Z09-07001	24.7	22.56	33.57	5.5	139.7	0.415	10.54	E, X, G, S	Int.-Ext.Upset
6 5/8	Z09-08000	25.2	22.21	33.04	6.625	168.3	0.33	8.38	E, X, G, S	Int.-Ext.Upset
6 5/8	Z09-08001	27.72	24.24	36.06	6.625	168.3	0.362	9.19	E, X, G, S	Int.-Ext.Upset

TOOL JOINTS



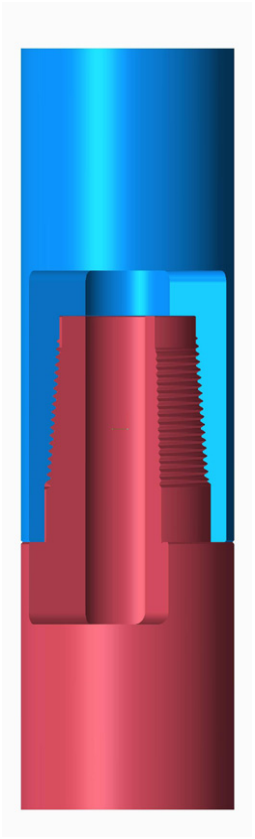
Specifications - Tool Joints

Tool joint designation	Size and style	Nom. Wt. lb/ft	Product Code	Grade	Outside Dia. of Pin and Box D	Inside Dia. of Pin d	Bevel Dia. of Pin and Box shoulder DF	Total length Tool Joint Pin LP	Pin Tong Space LPB	Box Tong Space LB	Combined Length of pin And Box L	Dia. of Box at Elevator Upset DPE	Dia. of Box at Elevator Upset DTE
NC26 2 3/8IF	23/8EU	6.65	Z12-0201	E	3 3/8	1 3/4	3 17/64	10.00	7	8	15	2 9/16	2 9/16
			Z12-0202	X	3 3/8	1 3/4	3 17/64	10.00	7	8	15	2 9/16	2 9/16
			Z12-0203	G	3 3/8	v	3 17/64	10.00	7	8	15	2 9/16	2 9/16
NC31 2 7/8IF	2 7/8EU	10.40	Z12-0301	E	4 1/8	2 1/8	3 61/64	10 1/2	7	9	16	3 3/16	3 3/16
			Z12-0302	X	4 1/8	2	3 61/64	10 1/2	7	9	16	3 3/16	3 3/16
			Z12-0303	G	4 1/8	2	3 61/64	10 1/2	7	9	16	3 3/16	3 3/16
			Z12-0304	S	4 3/8	1 5/8	3 61/64	10 1/2	7	9	16	3 3/16	3 3/16
NC38	3 1/2EU	9.50	Z12-0501	E	4 3/4	2 11/16	4 37/64	11 1/2	8	10 1/2	18 1/2	3 7/8	3 7/8
NC38 3 1/2IF	3 1/2EU	13.3	Z12-0502	E	4 3/4	2 11/16	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
			Z12-0503	X	5	2 9/16	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
			Z12-0504	G	5	2 7/16	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
			Z12-0505	S	5	2 1/8	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
		15.5	Z12-0506	E	5	2 9/16	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
			Z12-0507	X	5	2 7/16	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
			Z12-0508	G	5	2 1/8	4 37/64	12	8	10 1/2	18 1/2	3 7/8	3 7/8
NC40 4FH	3 1/2EU	15.5	Z12-0601	S	5 1/2	2 1/4	5 1/64	11 1/2	7	10	17	3 7/8	3 7/8
	4IU	14.0	Z12-0602	E	5 1/4	2 13/16	5 1/64	11 1/2	7	10	17	4 3/16	4 3/16
			Z12-0603	X	5 1/4	2 11/16	5 1/64	11 1/2	7	10	17	4 3/16	4 3/16
			Z12-0604	G	5 1/2	2 7/16	5 1/64	11 1/2	7	10	17	4 3/16	4 3/16
			Z12-0605	S	5 1/2	2	5 1/64	11 1/2	7	10	17	4 3/16	4 3/16
NC46 4IF	4 EU	14.00	Z12-0801	E	6	3 1/4	5 23/32	11 1/2	7	10	17	4 1/2	4 1/2
			Z12-0802	X	6	3 1/4	5 23/32	11 1/2	7	10	17	4 1/2	4 1/2
			Z12-0803	G	6	3 1/4	5 23/32	11 1/2	7	10	17	4 1/2	4 1/2
			Z12-0804	S	6	3	5 23/32	11 1/2	7	10	17	4 1/2	4 1/2
	4 1/2IU	13.75	Z12-0805	E	6	3 3/8	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
		16.6	Z12-0806	E	6 1/4	3 1/4	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0807	X	6 1/4	3	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0808	G	6 1/4	3	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0809	S	6 1/4	2 3/4	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
	4 1/2IEU	20.00	Z12-0810	E	6 1/4	3	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0811	X	6 1/4	2 3/4	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0812	G	6 1/4	2 1/2	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16
			Z12-0813	S	6 1/4	2 1/4	5 23/32	11 1/2	7	10	17	4 11/16	4 11/16

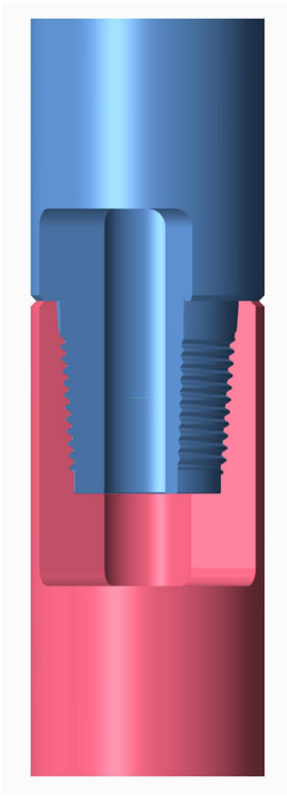
Specifications - Tool Joints

Tool joint designation	Size and style	Nom. Wt. lb/ft	Product Code	Grade	Outside Dia. of Pin and Box D	Inside Dia. of Pin d	Bevel Dia. of Pin and Box shoulder DF	Total length Tool Joint Pin LP	Pin Tong Space LPB	Box Tong Space LB	Combined Length of pin And Box L	Dia. of Box at Elevator Upset DPE	Dia. of Box at Elevator Upset DTE
NC50 4 1/2IF	4 1/2EU	13.75 16.60	Z12-0901	E	6 5/8	3 3/4	6 1/16	11 1/2	7	10	17	5	5
			Z12-0902	E	6 5/8	3 3/4	6 1/16	11 1/2	7	10	17	5	5
			Z12-0903	X	6 5/8	3 3/4	6 1/16	11 1/2	7	10	17	5	5
			Z12-0904	G	6 5/8	3 3/4	6 1/16	11 1/2	7	10	17	5	5
			Z12-0905	S	6 5/8	3 1/2	6 1/16	11 1/2	7	10	17	5	5
		20.00	Z12-0906	E	6 5/8	3 5/8	6 1/16	11 1/2	7	10	17	5	5
			Z12-0907	X	6 5/8	3 1/2	6 1/16	11 1/2	7	10	17	5	5
			Z12-0908	G	6 5/8	3 1/2	6 1/16	11 1/2	7	10	17	5	5
			Z12-0909	S	6 5/8	3	6 1/16	11 1/2	7	10	17	5	5
	5 IEU	19.5	Z12-0910	E	6 5/8	3 3/4	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
			Z12-0911	X	6 5/8	3 1/2	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
			Z12-0912	G	6 5/8	3 1/4	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
			Z12-0913	S	6 5/8	2 3/4	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
		25.60	Z12-0914	E	6 5/8	3 1/2	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
			Z12-0915	X	6 5/8	3	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
			Z12-0916	G	6 5/8	2 3/4	6 1/16	11 1/2	7	10	17	5 1/8	5 1/8
5 1/2FH	5 IEU	19.50	Z12-2401	E	7	3 3/4	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2402	X	7	3 3/4	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2403	G	7	3 3/4	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2404	S	7 1/4	3 1/2	6 23/32	13	8	10	18	5 1/8	5 1/8
		25.60	Z12-2405	E	7	3 1/2	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2406	X	7	3 1/2	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2407	G	7 1/4	3 1/2	6 23/32	13	8	10	18	5 1/8	5 1/8
			Z12-2408	S	7 1/4	3 1/4	6 23/32	13	8	10	18	5 1/8	5 1/8
	51/2IEU	21.90	Z12-2409	E	7	4	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2410	X	7	3 3/4	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2411	G	7 1/4	3 1/2	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2412	S	7 1/4	3	6 23/32	13	8	10	18	5 11/16	5 11/16
		24.70	Z12-2413	E	7	4	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2414	X	7	3 1/2	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2415	G	7 1/4	3 1/2	6 23/32	13	8	10	18	5 11/16	5 11/16
			Z12-2416	S	7 1/2	3	6 23/32	13	8	10	18	5 11/16	5 11/16
6 5/8FH	6 5/8IEU	25.20	Z12-2501	E	8	5	7 45/64	13	8	10	18	5 11/16	5 11/16
			Z12-2502	X	8	5	7 45/64	13	8	11	19	6 15/16	6 15/16
			Z12-2503	G	8 1/4	4 3/4	7 45/64	13	8	11	19	6 15/16	6 15/16
			Z12-2504	S	8 1/4	4 1/4	7 45/64	13	8	11	19	6 15/16	6 15/16
		25.20	Z12-2505	E	8	5	7 45/64	13	8	11	19	6 15/16	6 15/16
			Z12-2506	X	8 1/4	4 3/4	7 45/64	13	8	11	19	6 15/16	6 15/16
			Z12-2507	G	8 1/4	4 3/4	7 45/64	13	8	11	19	6 15/16	6 15/16
			Z12-2508	S	8 1/2	4 1/4	7 45/64	13	8	11	19	6 15/16	6 15/16

HIGH TORQUE DOUBLE SHOULDER THREAD



TT type



THDS type

Under challenging well conditions, drilling tools are often subjected to high torsional stress, resulting in premature failure and drilling accidents. To cater for these applications, Tianhe has introduced two types of high torque double shoulder thread (TT Type and THDS Type).

Features of TT type double shoulder thread:-

1. Higher torsional strength and bending stiffness
2. Even distribution of force on the threads
3. Tool connections with double shoulder thread are more rigid, stronger and has greater torque capacity
4. Smooth transition between the pin and box thread connections, creates a streamlined ID profile. This allows smoother fluid flow during drilling with minimized turbulence, improving the hydraulic performance, minimizing thread erosion and reducing drill collar failure
5. Excellent sealing performance

Features of THDS type double shoulder thread:-

1. High torsional resistance
2. Interchangeable with API connections of comparable sizes
3. Excellent sealing performance
4. Minimize pressure loss

DRILL COLLAR-STANDARD AND SPIRAL

Drill Collar are the basic component in the BHA which provides weight on the bit for drilling and keeps the drillsting in tension.

Our Drill Collars are approved to NS-1 certification standards, it is manufactured from 4145H modified quenched and tempered steel, strict metallurgical specifications are followed to insure that full length heat treating produces a consistent maximum depth of hardness.

Features and Benefits

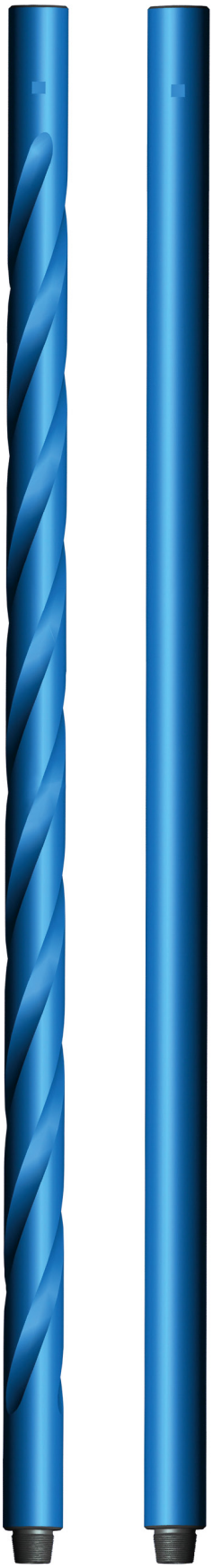
- A hardness range of 285 to 341 BHN and a Charpy impact value of 40 ft-lbs are guaranteed at evenly distributed 16 points in any sections at room temperature;
- Connections are completed (phosphate coated)to protect them from the elements after machining and to help prevent galling upon initial make-up;
- Thread roots are cold rolled on API and H-90 connections;
- Pressed steel thread protectors are supplied for all drill collar that are equipped with standard connections

When ordering Please specify;

- Drill collar OD and ID;
- Overall length;
- Connections required (size and type);
- Special features desired, for example:
  Slick or Spiral;
  Stress Relief Features;
  Slip and/or Elevator Recess;
  Hardbanding;

Specifications - Drill collar

Number and connection table	Product Code	Outside Diameter		Inside Diameter		Length mm	Bevel Diameter mm	Bending Strength Ratio
		mm	in	mm	in			
NC23-31	Z01/Z02-01000	79.4	3 1/8	31.8	1 1/4	9150	76.2	2.57:1
NC26-35(2 3/8 IF)	Z01/Z02-02000	88.9	3 1/2	38.1	1 1/2	9150	84.5	2.42:1
NC31-41(2 7/8 IF)	Z01/Z02-04000	104.8	4 1/8	50.8	2	9150	101.6	2.43:1
NC35-47	Z01/Z02-06000	120.6	4 3/4	50.8	2	9150	114.7	2.58:1
NC38-50(31/2IF)	Z01/Z02-07000	127	5	57.2	2 1/4	9150	121	2.38:1
NC44-60	Z01/Z02-23000	152.4	6	57.2	2 1/4	9150 or 9450	144.5	2.49:1
NC44-60	Z01/Z02-23100	152.4	6	71.4	2 13/16	9150 or 9450	144.5	2.84:1
NC44-62	Z01/Z02-08000	158.8	6 1/4	57.2	2 1/4	9150 or 9450	149.2	2.91:1
NC46-62(4IF)	Z01/Z02-08100	158.8	6 1/4	71.4	2 13/16	9150 or 9450	150	2.63:1
NC46-65(4IF)	Z01/Z02-09000	165.1	6 1/2	57.2	2 1/4	9150 or 9450	154.8	2.76:1
NC46-65(4IF)	Z01/Z02-09100	165.1	6 1/2	71.4	2 13/16	9150 or 9450	154.8	3.05:1
NC46-67(4IF)	Z01/Z02-11000	171.4	6 3/4	57.2	2 1/4	9150 or 9450	159.5	3.18:1
NC50-67(41/2IF)	Z01/Z02-11100	171.4	6 3/4	71.4	2 13/16	9150 or 9450	159.5	2.37:1
NC50-70(41/2IF)	Z01/Z02-12000	177.8	7	57.2	2 1/4	9150 or 9450	164.7	2.54:1
NC50-70(41/2IF)	Z01/Z02-12100	177.8	7	71.4	2 13/16	9150 or 9450	164.7	2.73:1
NC50-72(41/2IF)	Z01/Z02-24000	184.2	7 1/4	71.4	2 13/16	9150 or 9450	169.5	3.12:1
NC56-77	Z01/Z02-13000	196.8	7 3/4	71.4	2 13/16	9150 or 9450	185.3	2.70:1
NC56-80	Z01/Z02-14000	203.2	8	71.4	2 13/16	9150 or 9450	190.1	3.02:1
6 5/8 REG	Z01/Z02-15000	209.6	8 1/4	71.4	2 13/16	9150 or 9450	195.7	2.93:1
NC61-90	Z01/Z02-16000	228.6	9	71.4	2 13/16	9150 or 9450	212.7	3.17:1
7 5/8 REG	Z01/Z02-17000	241.3	9 1/2	76.2	3	9150 or 9450	223.8	2.81:1
NC70-97	Z01/Z02-25000	247.6	9 3/4	76.2	3	9150 or 9450	232.6	2.57:1
NC70-100	Z01/Z02-18000	254	10	76.2	3	9150 or 9450	237.3	2.81:1
8 5/8 REG	Z01/Z02-19000	279.4	11	76.2	3	9150 or 9450	266.7	2.84:1
Slips and elevator grooves can be produced upon the customers' requirement.								



Spiral Drill Collar (Z02)

Standard Drill Collar (Z01)

SPECIAL FEATURES FOR DRILL COLLAR

Spiral Grooving

Spiral Grooving In order to avoid differential pressure sticking in the hole.

Spiral Grooved Drill Collars:usual sizes

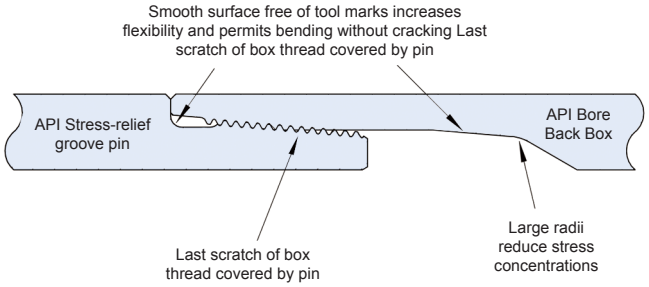
OD	4 3/4"	6 1/4"	6 3/4"	7 1/4"	7"1/2	8"	9 1/2"	10"	11"
Depth of cut (in)	7/32 ±1/32	9/32 ±1/16	5/16 ±1/16	11/32 ±1/16	11/32 ±1/16	3/8 ±1/16	13/32 ±3/12	7/16 ±3/32	15/32 ±3/32
Spiral pitch (in)	38 ±1	42 ±1	46 ±1	64 ±1	64 ±1	68 ±1	72 ±1	76 ±1	80 ±1

Note 1-Loss of weight is approximatively 4%, compared to slick drill collars.
Note 2-Length of spiraled section allows reconditionning of connections.

Stress Relief Groove & Bore Back Box

Stress relief grooves improve bending strength of pin and box connections and, therefore, durability. Stress relief grooves for box and pin are defined by API.

Bore back box is nothing but gradual reduction of internal diameter by gradually increasing material cross sectional area at critical section. This will ultimately reduce drastically stress concentration during Static / Dynamic loading and prevents box connections from failure.



Hardbanding

We provide several hardbanding materials for Customer's choice: Arnco-100XT, Arnco-300XT, TCS-8000;

Slip and Elevator Recess

Slip and elevator recesses improve downhole handling efficiency and safety. Slip and elevator recesses are machined in accordance with API 7-1.

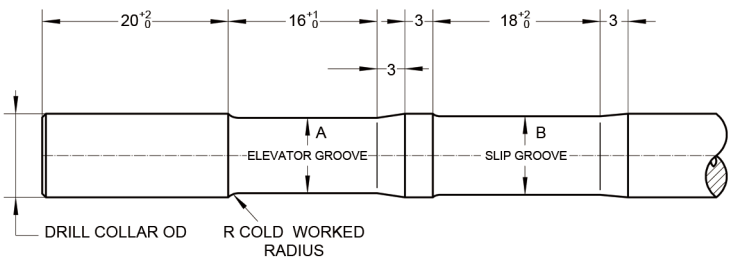
Recommended Hardbanding Location -

Drill collars with slip and elevator recesses (ZIP)

4"long wear pad above elevator recess
1"long wear pad above slip recess.
10"long wear pad under slip recess
-Drill collars with slip recess:
10"long wear pad under slip recess,
4"long wear pad above slip recess.
-Drill collars without slip and elevator recesses:
10"long wear pad at 30"from pin shoulder.

Drill Collars

OD (in)	A (in)	B (in)	R (in)
10	9 1/8	9 1/2	1/4
9 3/4	8 7/8	9 1/4	1/4
9 1/2	8 5/8	9	1/4
9 1/4	8 3/8	8 3/4	1/4
9	8 1/8	8 1/2	1/4
8 1/2	7 3/4	8	3/16
8	7 1/4	7 1/2	3/16
7 3/4	7	7 1/4	3/16
7 1/2	6 3/4	7	3/16
7 1/4	6 1/2	6 3/4	3/16
7	6 1/4	6 1/2	3/16
6 3/4	6	6 1/4	3/16
6 1/2	5 7/8	6	1/8
6 1/4	5 5/8	5 3/4	1/8
6	5 3/8	5 1/2	1/8
5 3/4	5 1/8	5 1/4	1/8
4 3/4	4 1/4	4 3/8	1/8
4 1/8	3 11/16	3 3/4	1/8



Spiral Drill Collar With Slip and Elevator Recess (Z02)

NON-MAGNETIC DRILL COLLAR

Non-magnetic Drill collars are made from Non-magnetic steel bars with low-strength by combining a proprietary chemical analysis and a rotary hammer forging process with low magnetic permeability excellent machine ability, it will not interfere with specialized directional equipment and will enhance the performance of the drilling operation.

Non-mag drill collars may function as housing for MWD tools, while at the same time providing drillstring weight. Our non-mag drill collars are suitable for all types of drilling including straight and directional applications.

Each drill collar is fully inspected by our own internal inspection dept. All data obtained are recorded on the inspection certificate furnished with each drill collar. API monogram, serial number, OD, ID, type and size of connections are stamped on recessed mill flats.

We can provide three type of non magnetic drill collar according to the customers' order; include Slick, Spiral, and Flex Non-Mag Drill Collar.

Slick Non-Mag Drill Collar

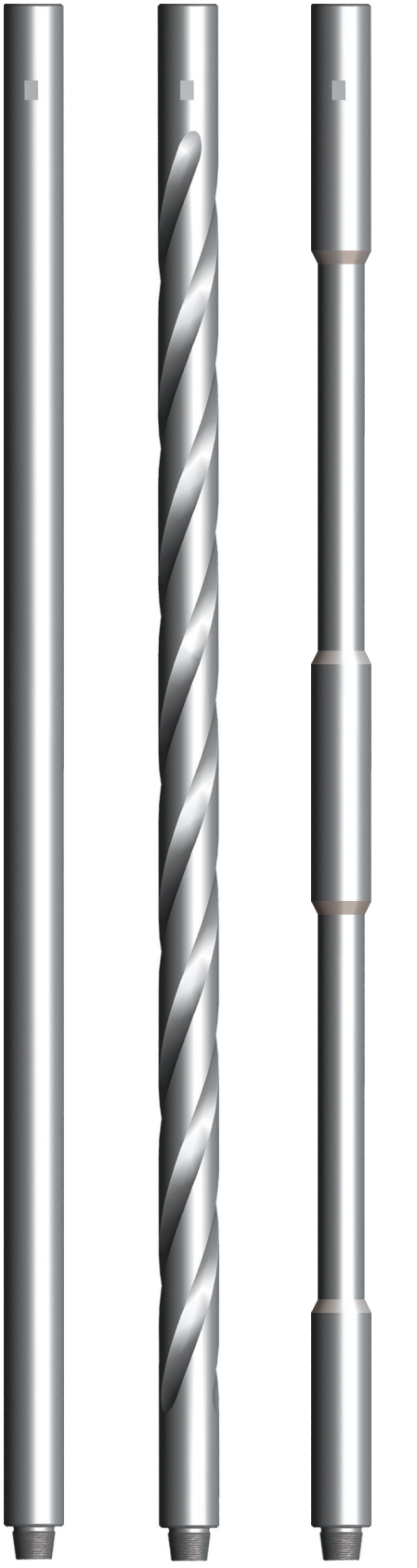
Slick Non-Mag Drill Collars provide the required weight on bit, and will not interfere with the directional drilling ability.

Spiral Non-Mag Drill Collar

Spiral Non-Mag Drill Collars are designed to allow greater flow area for drilling fluids, while providing the benefits of non-mag steel for complex drilling programs.

Flex Non-Mag Drill Collar

Flex Non-Mag Drill Collars are thinner and more flexible than standard drill collar. Their ability to make short radius turns, bend for high build angles, and pass through severe doglegs makes them ideal for use in directional and horizontal applications. Manufactured with non-mag steel, this drill collar is well suited for housing MWD equipment.



Non-Magnetic Drill Collar (Z10)

Spiral Non-Magnetic Drill Collar (Z11)

Non-Magnetic Flex Drill Collar (Z12)

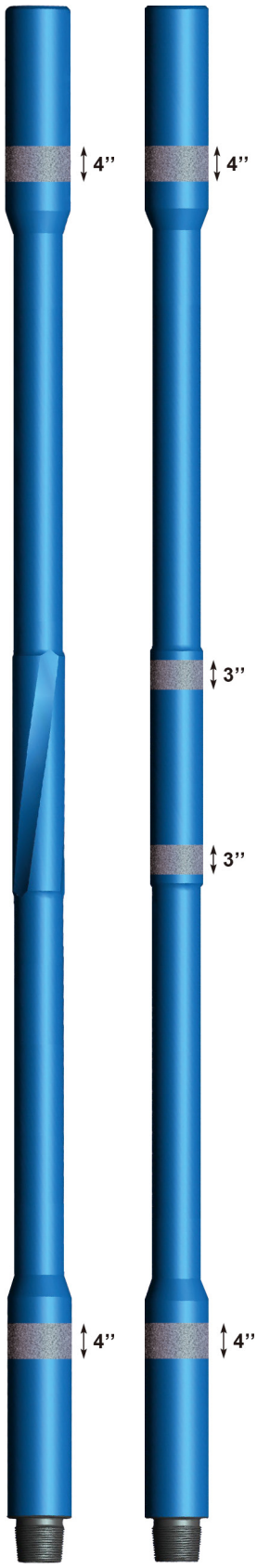
HEAVY WEIGHT DRILL PIPE

Heavy Weight Drill Pipe (HWDP) is an intermediate weight drill stem component which is used in conjunction with the drill pipe and drill collars. Available in standard, spiral and non-magnetic designs. In some applications, heavy-weight also can be used instead of the drill collars.

Our HWDP has been approved to NS-1 certification standards and is made from one-piece 4145H modified quenched and tempered steel. It is designed for the toughest of drilling environments in vertical and directional wells; for vertical wells our HWDP is a transition member; for directional holes it is a weight member and provides additional stiffness to prevent buckling.

Features and Benefits

- A centre upset or wear pad to increase tube life, reduce hole drag and differential sticking problems;
- Connections are completed(phosphate coated)to protect them from the elements after machining and to help prevent galling upon initial make-up;
- Thread roots are cold rolled on API and H-90 connections. And pressed steel thread protectors are supplied for standard connections;
- Hardbanding and Internal Coating can be provided on customer's request.



Spiral Heavy Weight Drill Pipe (Z08)

Heavy Weight Drill Pipe (Z07)

Specifications - Heavy Weight Drill Pipe

Size(in)	Product Code	O.D. (in)	I.D. (in)	Tool Joint O.D. (in)	Tool Joint I.D. (in)	Connection	Max.elevator diameter (in)	Central upset dia. (in)	Min.drift dia.size (in)
3 1/2	Z07-03000	3 1/2	2 1/4	4 3/4 (4 7/8, 5)	2 1/4	NC38	3 7/8	4	2
	Z07-03001		2 1/16		2 1/16				1 13/16
4	Z07-04000	4	2 1/2	5 1/4	2 1/2	NC40	4 3/16	4 1/2	2 1/4
	Z07-04001		2 9/16		2 9/16				2 5/16
4 1/2	Z07-05000	4 1/2	2 11/16	6 1/4	2 11/16	NC46	4 11/16	5	2 7/16
	Z07-05001		2 3/4		2 3/4				2 1/2
	Z07-05002		2 13/16		2 13/16				2 9/16
5	Z07-06000	5	3	6 5/8	3	NC50	5 1/8	5 1/2	2 3/4
5 1/2	Z07-07000	5 1/2	3 1/4	7 (7 1/4, 7 1/2)	3 1/4	5 1/2 FH	5 11/16	6	3
	Z07-07001		3 3/8		3 3/8				3 1/8
	Z07-07002		3 7/8		3 7/8				3 5/8
	Z07-07003		4		4				3 3/4
6 5/8	Z07-08000	6 5/8	4	8 (8 1/4, 8 1/2)	4	6 5/8 FH	6 15/16	7 1/8	3 3/4
	Z07-08001		4 1/2		4 1/2				4 1/4
	Z07-08002				5				4 3/4

INTEGRAL BLADE STABILIZER

Our Integral Blade Stabilizer (IBS) is a one piece rotating stabilizer which can be placed near bit or up in the drill string. It is a one piece construction manufactured from high strength alloy steel (non-magnet steel optional). It prevents differential sticking of the drillstring by stabilizing the BHA and keeping drill collars and drill pipes away from the borehole wall. Thus reducing vibration, drill pipe whirl, and wellbore tortuosity; furthermore, the stabilization maintains drilling trajectory whether drilling straight, horizontal, or directional wells.

Optional Stabilizers

We offer several options for IBS, in both alloy steel and non-magnet materials:

- Spiral Integral Blade Stabilizer;
- Straight Integral Blade Stabilizer;
- Non-Magnet Integral Blade Stabilizer;

When Ordering Please Specify:

- Hole size or required blade O.D.;
- Number of blades required (3 or 4 are standard styles);
- Straight or spiral blades;
- Hardfacing type ;
- Top and Bottom Connections;
- Body diameter required;
- String or Near Bit application;
- Alloy steel or non-magnet materials ;
- Special features SRG on connections, bored for float etc.

Spiral Integral Blade Stabilizer (W01)

Straight Integral Blade Stabilizer (W04)

Non-Magnet Integral Blade Stabilizer (W17)

Specifications - Spiral Integral Blade Stabilizer

Product Code					OD stab	Body OD	Bore	Fishing neck length	Crown length	Blade taper angle		Overall length	Whorl	
HF1000	HF2000	HF300 0	HF4000	HF5000						Top	Down		Top	Down
W0113701	W0123701	W0133701	W0143701	W0153701	"3 3/4“ 95.3mm "	"3 1/8“ 79.4mm "	"1 1/4“ 31.8mm "	"26“ 660mm "	"10"" 254mm"	30°	15°	"58“ 1480mm "	NC23 B	NC23 P
W0113702	W0123702	W0133702	W0143702	W0153702	"3 3/4“ 95.3mm "	"3 1/8“ 79.4mm "	"1 1/4“ 31.8mm "	"26“ 660mm "	"10"" 254mm"	30°	15°	"58“ 1480mm "	NC23 B	2 3/8REG B
W0114501	W0124501	W0134501	W0144501	W0154501	"4 1/2“ 114.3mm "	"3 1/2“ 88.9mm "	"1 1/2“ 38.1mm "	"26“ 660mm "	"10"" 254mm"	30°	15°	"59“ 1500mm "	NC26 B	NC26 P
W0114502	W0124502	W0134502	W0144502	W0154502	"4 1/2“ 114.3mm "	"3 1/2“ 88.9mm "	"1 1/2“ 38.1mm "	"26“ 660mm "	"10"" 254mm"	30°	15°	"59“ 1500mm "	NC26 B	2 3/8REG B
W0115501	W0125501	W0135501	W0145501	W0155501	"5 1/2"" 139.7mm"	4 3/4" 120.6mm	"2 “ 50.8mm "	30" 762mm	12“ 305mm	30°	15°	"68“ 1730mm"	NC38 B	NC38 P
W0115502	W0125502	W0135502	W0145502	W0155502	"5 1/2"" 139.7mm"	4 3/4" 120.6mm	"2 “ 50.8mm "	30" 762mm	12“ 305mm	30°	15°	"68“ 1730mm"	NC38 B	3 1/2/REG B
W0110301	W0120301	W0130301	W0140301	W0150301	"6"" 152.4mm"	4 3/4" 120.6mm	"2 “ 50.8mm "	30" 762mm	12“ 305mm	30°	15°	"69“ 1760mm"	NC38 B	NC38 P
W0110302	W0120302	W0130302	W0140302	W0150302	"6"" 152.4mm"	4 3/4" 120.6mm	"2 “ 50.8mm "	30" 762mm	12“ 305mm	30°	15°	"69“ 1760mm"	NC38 B	3 1/2REG B
W0110802	W0120802	W0130802	W0140802	W0150802	"7 7/8"" 200mm"	6 1/2" 165.1mm	"2 13/16 “ 71.4mm "	30" 762mm	16“ 406mm	30°	30°	"72“ 1830mm"	NC46 B	4 1/2REG B
W0110704	W0120704	W0130704	W0140704	W0150704	7 5/8" 193.7mm	6 1/2" 165.1mm	2 13/16 " 71.4mm "	30" 762mm	16“ 406mm	30°	30°	72“ 1830mm"	NC46 B	NC46 P
W0110803	W0120803	W0130803	W0140803	W0150803	"7 1/2"" 190.5mm	6 1/2" 171mm	"2 13/16 “ 71.4mm "	30" 762mm	16“ 406mm	30°	30°	"73“ 1860mm"	NC50 B	NC50 P
W0110702	W0120702	W0130702	W0140702	W0150702	7 1/2" 190.5mm	6 1/2" 165.1mm	2 13/16 " 71.4mm "	30" 762mm	16“ 406mm	30°	30°	73“ 1830mm"	NC46 B	4 1/2REG B
W0110804	W0120804	W0130804	W0140804	W0150804	8" 203.2mm"	6 3/4" 171mm	2 13/16 " 71.4mm "	30" 762mm	16“ 406mm	30°	30°	73“ 1860mm"	NC50 B	4 1/2REG B
W0110801	W0120801	W0130801	W0140801	W0150801	7 7/8"	6 1/2"	2 13/16 "	30"	16“	30°	30°	72“	NC46 B	NC46 P

INTEGRAL BLADE STABILIZER

Specifications - Spiral Integral Blade Stabilizer

Product Code					OD stab	Body OD	Bore	Fishing neck length	Crown length	Blade taper angle		Overall length	Whorl	
HF1000	HF2000	HF300 0	HF4000	HF5000						Top	Down		Top	Down
W0111101	W0121101	W0131101	W0141101	W0151101	"8 1/2"" 215mm"	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	"73" 1860mm"	NC50 B	NC50 P
W0111102	W0121102	W0131102	W0141102	W0151102	"8 1/2"" 215mm"	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	"73" 1860mm"	NC50 B	4 1/2REG B
W0111401	W0121401	W0131401	W0141401	W0151401	"9 1/2"" 241.3mm"	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	"75" 1900mm"	NC50 B	NC50 P
W0111402	W0121402	W0131402	W0141402	W0151402	"9 1/2"" 241.3mm"	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	"75" 1900mm"	NC50 B	4 1/2REG B
W0112001	W0122001	W0132001	W0142001	W0152001	"12"" 304.8mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"79"" 2010mm"	6 5/8REG B	6 5/8REG P
W0112002	W0122002	W0132002	W0142002	W0152002	"12"" 304.8mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"79"" 2010mm"	6 5/8REG B	6 5/8REG B
W0112101	W0122101	W0132101	W0142101	W0152101	"12 1/4"" 311mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"79"" 2010mm"	6 5/8REG B	6 5/8REG P
W0112102	W0122102	W0132102	W0142102	W0152102	"12 1/4"" 311mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"79"" 2010mm"	6 5/8REG B	6 5/8REG B
W0112201	W0122201	W0132201	W0142201	W0152201	"14 3/4"" 374mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"84"" 2140mm"	6 5/8REG B	6 5/8REG P
W0112202	W0122202	W0132202	W0142202	W0152202	"14 3/4"" 374mm"	"8"" 203.2mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"84"" 2140mm"	6 5/8REG B	6 5/8REG B
W0112203	W0122203	W0132203	W0142203	W0152203	"15 1/2"" 393.7mm"	"8"" 203.3mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"85"" 2160mm"	6 5/8REG B	6 5/8REG P
W0112204	W0122204	W0132204	W0142204	W0152204	"15 1/2"" 393.7mm"	"8"" 203.3mm"	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	"85"" 2160mm"	6 5/8REG B	6 5/8REG B
W0112301	W0122301	W0132301	W0142301	W0152301	"16"" 406.4mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"85"" 2160mm"	7 5/8REG B	7 5/8REG P
W0112302	W0122302	W0132302	W0142302	W0152302	"16"" 406.4mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"85"" 2160mm"	7 5/8REG B	7 5/8REG B
W0112401	W0122401	W0132401	W0142401	W0152401	"17"" 431.8mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"88"" 2240mm"	7 5/8REG B	7 5/8REG P
W0112402	W0122402	W0132402	W0142402	W0152402	"17"" 431.8mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"88"" 2240mm"	7 5/8REG B	7 5/8REG B
W0112501	W0122501	W0132501	W0142501	W0152501	"17 1/2"" 444mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"88"" 2240mm"	7 5/8REG B	7 5/8REG P
W0112502	W0122502	W0132502	W0142502	W0152502	"17 1/2"" 444mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"88"" 2240mm"	7 5/8REG B	7 5/8REG B
W0112601	W0122601	W0132601	W0142601	W0152601	"20"" 508mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"92"" 2340mm"	7 5/8REG B	7 5/8REG P
W0112602	W0122602	W0132602	W0142602	W0152602	"20"" 508mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	30°	30°	"92"" 2340mm"	7 5/8REG B	7 5/8REG B
W0112701	W0122701	W0132701	W0142701	W0152701	"22"" 558.8mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	35°	35°	"92"" 2340mm"	7 5/8REG B	7 5/8REG P
W0112702	W0122702	W0132702	W0142702	W0152702	"22"" 558.8mm"	9 1/2" 241.3mm	"3 " 76.2mm "	30" 762mm	20" 508mm	35°	35°	"92"" 2340mm"	7 5/8REG B	7 5/8REG B
W0112801	W0122801	W0132801	W0142801	W0152801	"24"" 609.6mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"97"" 2460mm"	7 5/8REG B	7 5/8REG P
W0112802	W0122802	W0132802	W0142802	W0152802	"24"" 609.6mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"97"" 2460mm"	7 5/8REG B	7 5/8REG B
W0112901	W0122901	W0132901	W0142901	W0152901	"26"" 660mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"100"" 2540mm"	7 5/8REG B	7 5/8REG P
W0112902	W0122902	W0132902	W0142902	W0152902	"26"" 660mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"100"" 2540mm"	7 5/8REG B	7 5/8REG B
W0113401	W0123401	W0133401	W0143401	W0153401	"28"" 711mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"102"" 2590mm"	7 5/8REG B	7 5/8REG P
W0113402	W0123402	W0133402	W0143402	W0153402	"28"" 711mm"	9 1/2" 241.3mm	"3 " 76.2mm "	32" 813mm	20" 508mm	45°	45°	"102"" 2590mm"	7 5/8REG B	7 5/8REG B
W0113001	W0123001	W0133001	W0143001	W0153001	"30"" 762mm"	9 1/2" 241.3mm	"3 " 76.2mm "	34" 864mm	20" 508mm	45°	45°	"107"" 2720mm"	7 5/8REG B	7 5/8REG P
W0113002	W0123002	W0133002	W0143002	W0153002	"30"" 762mm"	9 1/2" 241.3mm	"3 " 76.2mm "	34" 864mm	20" 508mm	45°	45°	"107"" 2720mm"	7 5/8REG B	7 5/8REG B
W0113101	W0123101	W0133101	W0143101	W0153101	"36"" 914mm"	9 1/2" 241.3mm	"3 " 76.2mm "	36" 914mm	20" 508mm	45°	45°	"120"" 3050mm"	7 5/8REG B	7 5/8REG P
W0113102	W0123102	W0133102	W0143102	W0153102	"36"" 914mm"	9 1/2" 241.3mm	"3 " 76.2mm "	36" 914mm	20" 508mm	45°	45°	"120"" 3050mm"	7 5/8REG B	7 5/8REG B

INTEGRAL BLADE STABILIZER

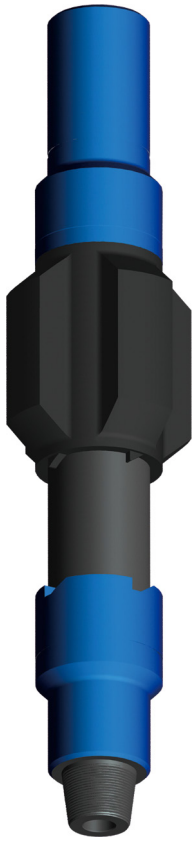
Specifications - Straight Integral Blade Stabilizer

Product Code					OD stab	Body OD	Bore	Fishing neck length	Crown length	Blade taper angle		Overall length	Whorl	
HF1000	HF2000	HF300 0	HF4000	HF5000						Top	Down		Top	Down
W0410301	W0420301	W0430301	W0440301	W0450301	6" 152.4mm	4 3/4" 120.6mm	2 " 50.8mm	30" 762mm	12" 305mm	30°	15°	69" 1760mm	NC38 B	NC38 P
W0410302	W0420302	W0430302	W0440302	W0450302	6" 152.4mm	4 3/4" 120.6mm	2 " 50.8mm	30" 762mm	12" 305mm	30°	15°	69" 1760mm	NC38 B	3 1/2REG B
W0410701	W0420701	W0430701	W0440701	W0450701	7 1/2" 190.5mm	6 1/2" 165.1mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	72" 1830mm	NC46 B	NC46 P
W0410702	W0420702	W0430702	W0440702	W0450702	7 1/2" 190.5mm	6 1/2" 165.1mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	72" 1830mm	NC46 B	4 1/2REG B
W0410801	W0420801	W0430801	W0440801	W0450801	7 7/8" 200mm	6 1/2" 165.1mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	72" 1830mm	NC46 B	NC46 P
W0410802	W0420802	W0430802	W0440802	W0450802	7 7/8" 200mm	6 1/2" 165.1mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	72" 1830mm	NC46 B	4 1/2REG B
W0410803	W0420803	W0430803	W0440803	W0450803	8" 203.2mm	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	73" 1860mm	NC50 B	NC50 P
W0410804	W0420804	W0430804	W0440804	W0450804	"8"" 203.2mm"	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	73" 1860mm	NC50 B	4 1/2REG B
W0411101	W0421101	W0431101	W0441101	W0451101	8 1/2" 215mm	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	73" 1860mm	NC50 B	NC50 P
W0411102	W0421102	W0431102	W0441102	W0451102	8 1/2" 215mm	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	73" 1860mm	NC50 B	4 1/2REG B
W0411401	W0421401	W0431401	W0441401	W0451401	9 1/2" 241.3mm	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	75" 1900mm	NC50 B	NC50 P
W0411402	W0421402	W0431402	W0441402	W0451402	9 1/2" 241.3mm	6 3/4" 171mm	2 13/16 " 71.4mm	30" 762mm	16" 406mm	30°	30°	75" 1900mm	NC50 B	4 1/2REG B
W0412001	W0422001	W0432001	W0442001	W0452001	12" 304.8mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	79" 2010mm	6 5/8REG B	6 5/8REG P
W0412002	W0422002	W0432002	W0442002	W0452002	12" 304.8mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	79" 2010mm	6 5/8REG B	6 5/8REG B
W0412101	W0422101	W0432101	W0442101	W0452101	12 1/4" 311mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	79" 2010mm	6 5/8REG B	6 5/8REG P
W0412102	W0422102	W0432102	W0442102	W0452102	12 1/4" 311mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	79" 2010mm	6 5/8REG B	6 5/8REG B
W0412201	W0422201	W0432201	W0442201	W0452201	14 3/4" 374mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	84" 2140mm	6 5/8REG B	6 5/8REG P
W0412202	W0422202	W0432202	W0442202	W0452202	14 3/4" 374mm	8" 203.2mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	84" 2140mm	6 5/8REG B	6 5/8REG B
W0412203	W0422203	W0432203	W0442203	W0452203	15 1/2" 393.7mm	8" 203.3mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	85" 2160mm	6 5/8REG B	6 5/8REG P
W0412204	W0422204	W0432204	W0442204	W0452204	"15 1/2"" 393.7mm"	8" 203.3mm	2 13/16 " 71.4mm	30" 762mm	18" 457mm	30°	30°	85" 2160mm	6 5/8REG B	6 5/8REG B
W0412301	W0422301	W0432301	W0442301	W0452301	16" 406.4mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	85" 2160mm	7 5/8REG B	7 5/8REG P
W0412302	W0422302	W0432302	W0442302	W0452302	"16"" 406.4mm"	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	85" 2160mm	7 5/8REG B	7 5/8REG B
W0412401	W0422401	W0432401	W0442401	W0452401	17" 431.8mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	88" 2240mm	7 5/8REG B	7 5/8REG P
W0412402	W0422402	W0432402	W0442402	W0452402	"17"" 431.8mm"	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	88" 2240mm	7 5/8REG B	7 5/8REG B
W0412501	W0422501	W0432501	W0442501	W0452501	17 1/2" 444mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	88" 2240mm	7 5/8REG B	7 5/8REG P
W0412502	W0422502	W0432502	W0442502	W0452502	17 1/2" 444mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	88" 2240mm	7 5/8REG B	7 5/8REG B
W0412601	W0422601	W0432601	W0442601	W0452601	20" 508mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	92" 2340mm	7 5/8REG B	7 5/8REG P
W0412602	W0422602	W0432602	W0442602	W0452602	20" 508mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	30°	30°	92" 2340mm	7 5/8REG B	7 5/8REG B
W0412701	W0422701	W0432701	W0442701	W0452701	22" 558.8mm	9 1/2" 241.3mm	3 " 76.2mm	30" 762mm	20" 508mm	35°	35°	92" 2340mm	7 5/8REG B	7 5/8REG P
W0412702	W0422702	W0432702	W0442702	W0452702	22" 558.8mm	9 1/2" 241.3mm	3" 76.2mm	30" 762mm	20" 508mm	35°	35°	92" 2340mm	7 5/8REG B	7 5/8REG B

NON-ROTATING STABILIZER

Non-rotating stabilizers(rubber sleeve stabilizer) avoid blade wear and wall damage. The non-rotating stabilizer consists of mandrel, copper washer, rubber sleeve, spacer sleeve and self-locking lower sub.

During drilling, the non-rotating stabilizer transfer the torque by means of mandrel, the rubber sleeve is sliding and moving relative to the mandrel, the rubber sleeve thus plays a role in stabilizer of well. A locking clutch (self-locking lower sub) will avoid sleeve rotation during wash over operation.



non-Rotating Stabilizer (W09)

When Ordering Please Specify:

- Casing size and weight;
- Hole size or required blade O.D.;
- Top and Bottom Connections.

Specifications - NON-ROTATING STABILIZER

Sleeve			Mandrel			Overall Length(mm)	Product Code
Length(mm)	O.D.(mm)	Blade Qty	I.D.(mm)	Fishing O.D.(mm)	Connection		
380	φ155	4	φ44	φ121	NC38	1638	W0900301
380	φ157	4	φ44	φ127	NC38	1638	W0900401
500	φ214	4	φ71	φ165	NC50	2013	W0901001
500	φ220	4	φ71	φ165	NC50	2013	W0901201
500	φ255	4	φ71	φ165	NC50	2013	W0901601
500	φ304	4	φ76	φ203	6 5/8 REG	2000	W0902001
500	φ310	4	φ76	φ203	6 5/8 REG	2000	W0902101
500	φ313	4	φ71	φ165	NC50	2013	W0902103
500	φ371	4	φ71	φ197	6 5/8 REG	2013	W0902201
500	φ374	4	φ71	φ203	6 5/8 REG	2013	W0902203
520	φ405	4	φ76	φ241	7 5/8 REG	2045	W0902301
520	φ430	4	φ76	φ241	7 5/8 REG	2045	W0902401
520	φ444	4	φ76	φ241	7 5/8 REG	2045	W0902501
600	φ558	4	φ76	φ241	7 5/8 REG	2130	W0902701
690	φ711	5	φ76	φ241	7 5/8 REG	2210	W0903401

REPLACEABLE SLEEVE STABILIZER

Replaceable Sleeve Stabilizers consist of an integral mandrel and a sleeve. One mandrel series can be equipped with different size of sleeve for several hole sizes. The sleeves are easily changed on the rig floor, either when changing hole size or changing the type of wear surface to match drilling conditions.

When ordering please specify:

- Mandrel series and sleeve O.D.;
- String or near bit application;
- Top and bottom connection;
- Hardfacing type.

Replaceable Sleeve Stabilizer (W05)

Specifications - Replaceable Sleeve Stabilizer

Product Code					Hole Size (in)	Mandrel Series	Sleeve		Body					Connection
HF1000	HF2000	HF300 0	HF4000	HF5000			Body diameter (in)	Sleeve Length (in)	Fishing Neck Range (in)	Upset O.D (in)	Bottom Neck O.D (in)	Overall Length (in)	Fishing Neck Length (in)	
W0511100	W0521100	W0531100	W0541100	W0551100	8 1/2	62	7 1/2	19	6 3/4	7 1/2	6 1/4	65	22	NC50
W0512100	W0522100	W0532100	W0542100	W0552100	12 1/4	77	9 1/2	20	8	9 1/4	7 3/4	70	22	6 5/8REG
W0512300	W0522300	W0532300	W0542300	W0552300	16	96	11 1/2	24	9 1/2	11	9	82 3/4	27	7 5/8REG
W0512500	W0522500	W0532500	W0542500	W0552500	17 1/2	96	11 1/2	24	9 1/2	11	9	82 3/4	27	7 5/8REG
W0512700	W0522700	W0532700	W0542700	W0552700	22	96	14 1/4	27.5	9 1/2	11	9	82.75	27	7 5/8REG
W0512800	W0522800	W0532800	W0542800	W0552800	24	96	14 1/4	27.5	9 1/2	11	9	82.75	27	7 5/8REG
W0512900	W0522900	W0532900	W0542900	W0552900	26	96	17	27.5	9 1/2	11	9	82.75	27	7 5/8REG
W0513400	W0523400	W0533400	W0543400	W0553400	28	96	17 1/4	27.5	9 1/2	11	9	82.75	27	7 5/8REG

HARDFACING TYPES OF STABILIZER

We offer a complete range of Hardfacing to suit all drilling conditions. All Stabilizers can be banded with following hardfacings.

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

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.

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.

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.

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°.

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

FIXED DIAMETER HOLE OPENER

Fixed Diameter Hole Openers are used for expanding the drilled hole. The cutters are manufactured under the strictest quality control. All our hole openers are field maintainable, with easy assembly and disassembly. They are all equipped with 3 or 4 cutters, as well as mud nozzles precisely located to clean the cutters and the hole simultaneously.

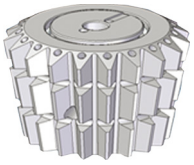
They are used for the following purposes.

1. When drilling of the big hole is not possible because of the rig capacity.
2. When a satisfied penetration rate is not obtained in case of the big hole drilling, it is used after drilling with smaller bit.
3. When the hole direction must be controlled.

When ordering please specify:

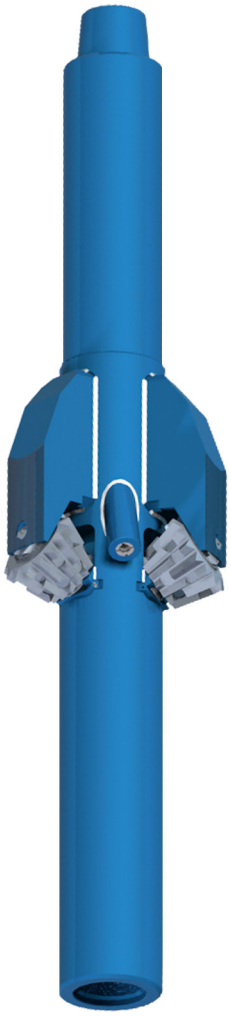
- Hole size to desire;
- Pilot hole size;
- Top and bottom connections;
- Fishing neck and bottom neck O.D and length;
- Type of cutters.

Type SM
Tooth type for soft
to medium formatlons



Type MH
Tooth type for medium
to hard formatlons

Type XH
Concical button type
for hard formatlons



Fixed Diameter
Hole Opener
(KL)

Specifications - FIXED DIAMETER HOLE OPENER

Model	Product Code	Hole open diameter	Qty of cutters	Min.Pilot hole	Fishing neck diameter	I.D.	Top connection(Pin)	Bottomconnection(Box)	Overall Length
KKQ209	KL09000	8 1/4"	3	5 1/2"	6 1/2"	1 1/4"	4 IF	3 1/2REG	55"
KKQ216	KL10000	8 1/2"	3	5 1/2"	6 1/2"	1 1/4"	4 IF	3 1/2REG	55"
KKQ311	KL01000	12 1/4"	3	8 1/2"	8"	1 1/2"	6 5/8REG	6 5/8REG	55"
KKQ406	KL02000	16"	3	10"	9 1/2"	2 1/4"	7 5/8REG	6 5/8REG	59"
KKQ444	KL03000	17 1/2"	3	10"	9 1/2"	2 1/4"	7 5/8REG	6 5/8REG	59"
KKQ559	KL04000	22"	3	12 3/4"	9 1/2"	2 1/4"	7 5/8REG	6 5/8REG	69"
KKQ584	KL05000	23"	3	12 3/4"	10"	3"	7 5/8REG	6 5/8REG	69"
KKQ610	KL06000	24"	3	14"	10"	3"	7 5/8REG	7 5/8REG	69"
KKQ660	KL07000	26"	3	17 1/2"	10"	3"	7 5/8REG	7 5/8REG	69"
KKQ813	KL11000	32"	3	17 1/2"	10"	3"	7 5/8REG	7 5/8REG	79"
KKQ4-914	KL08000	36"	4	26"	10"	3 1/2"	7 5/8REG	7 5/8REG	87"

ROLLER REAMER

Roller Reamers are designed for reaming and stabilization in any type of formation. All parts of the tools are made of special alloy steel and heat treated for hardness. Drilling crews can easily replace any part in the field without the use of special tools.

We offer three types of cutters for different type of formation.

When ordering please specify:

- Hole size;
- String type or near bit type;
- Drill collar size;
- Top and bottom connection;
- Cutter types.

Type B
Hard Formations

Type F
Medium to hard Formations

Type T
Soft Formations

Roller Reamer
(W16)

Specifications - Roller Reamer

Model	Product Code	O.D(mm)	I.D.(mm)	connection	Hole size(in)
WG155	W1104100	155	31.7	NC38	6 1/8
WG200	W1111100	200	38	NC46	7 7/8
WG212	W1111200	212	44	NC50	8 3/8
WG215	W1114100	215	44	NC50	8 1/2
WG244	W1121100	244	57	NC50	9 5/8
WG311	W1128100	311	71	6 5/8REG	12 1/4
WG444	W1131100	444	76	7 5/8REG	17 1/2
WG558	W1132100	558	76	7 5/8REG	22
WG660	W1134100	660	76	7 5/8REG	26
WG711	W1136100	711	76	7 5/8REG	28

CASING SCRAPER

This tool is ideal for the removal of dirt which may be left on the inside walls of casing, such as solid cement, hard wax, various salt crystals or deposits, perforation burrs, iron oxide residues resulted from rusting, so as to make all down hole tools pass through unblocked. Especially when minimal clearances are available between the down hole tools and casing ID.

Casing Scraper
(X01)

Working principle

Before RIH ,the max. installation size of blades shall be bigger than the casing ID. The blades are pressed by the casing ID thus compressing the internal spring down. The spring exerts a radial force against the blades. When hard materials need to be scraped, the section ID must be passed several times to ensure correct casing clean out. The scraper is connected on the low end of drill string,the moving of drill string up and down make an axially feeding in the scraping operation.
Each spiral blade has two internal and external curved scrapping edges. Blades will work during reciprocation thus the internal and external scraping edges are working in turn,and there is a wider transverse edge band between two scrapping edges stands a cutting and milling action to the cut surface.

The strap blades are uniformly distributed on the scraper to ensure consistent application of scraping force across all blades..

When ordering please specify:

- Casing Scraper Model;
- Connection, if nonstandard;
- Casing size and weight.

Specifications - Casing Scraper

Model	Applicable casing size (lb/ft)	OD of body (mm)	Max. OD of cutter stretch out (mm)	Min. OD of cutter stretch out (mm)	ID (mm)	Scraping range (mm)	Connection		Qty. of cutter (Pcs)	Qty. of spring (Pcs)	Product Code	
							Standard	Optional			Standard	Optional
GX114	4 1/2″(9.5~15.1)	90.5	106	92	20	97~104	2 3/8REG	2 3/8IF	2×3	30	X01-01010	X01-01020
GX114A	4 1/2″(13.5~18.8)	89	102	89	20	92.4~99.5	2 3/8REG	2 3/8IF	2×3	30	X01-01030	X01-01040
GX127	5″(11.5~18)	100	118	100	20	108.6~116	2 3/8REG	2 3/8IF	2×3	30	X01-02010	X01-02020
GX140	5 1/2″(14~23)	110	130	112	24	118.6~128	2 7/8REG	2 7/8IF	2×3	36	X01-03010	X01-03020
GX146	5 3/4″(14~25.2)	110	138	118	24	124~135	2 7/8REG	2 7/8IF	2×3	36	X01-04010	X01-04020
GX168	6 5/8″(20~32)	130	158	135	24	144~154	3 1/2REG	3 1/2IF	2×4	48	X01-05010	X01-05020
GX178	7″(17~38)	136	167	146	30	150~166	3 1/2REG	3 1/2IF	2×3	30	X01-06010	X01-06020
GX194	7 5/8″(24~45.3)	136	180	159	30	163.5~179	3 1/2REG	3 1/2IF	2×3	30	X01-07010	X01-07020
GX219	8 5/8″(24~52)	175	208	183	30	188~206	4 1/2REG	4 1/2IF	2×4	40	X01-08010	X01-08020
GX245	9 5/8″(32.3~61.1)	200	232	203	57	212.7~230	4 1/2REG	4 1/2IF	2×5	50	X01-09010	X01-09020
GX273	10 3/4″(32.75~71.1)	228	262	233	57	240~260	6 5/8REG	4 1/2IF	2×5	50	X01-10010	X01-10020
GX340	13 3/8″(48~72)	286	326	304	71	313.6~323	6 5/8REG	4 1/2IF	2×6	60	X01-11010	X01-11020
GX473	18 5/8″(73.09~109)	420	460	438	76	444.2~454	7 5/8REG	6 5/8REG	2×8	80	X01-12010	X01-12020
GX508	20″(84.75~133)	443	493	466	76	475~487	7 5/8REG	/	2×8	80	X01-13010	X01-13020

KEY SEAT WIPER

Key seats develop during the drilling process whenever deviation or major changes in direction occur. Our Key Seat Wipers in these conditions will save you from costly fishing jobs and downtime. The key seat reaming tool is a sleeve with five blades dressed with an aggressive tungsten carbide hardfacing.

OPERATION AND APPLICATION

The Key Seat Wiper is made-up just above the top drill collar. It contains a sliding reamer sleeve with an O.D. slightly larger than the drill collar. When coming out of the hole, this sleeve detects the key seat first - instead of the drill collar - by becoming wedged in restricted space.

By releasing the drill pipe, the sleeve may be jarred out of the key seat. A clutch-drive on the bottom of the sleeve and the lower body is engaged by right-hand rotation.

Slowly raising the string and continuing rotation allows the sleeve to function as a reamer and wipe out the key seat. The operation may be repeated to further enlarge the area, thus permitting free passage of the collars.

Spiral blades with tungsten carbide hard-facing provide fast cutting action and maximum resistance to wear.

When ordering please specify:

- Upper and Lower Neck Diameter;
- Upper and Lower Connections;
- Circulation bore;
- Drill collar O.D. or gauge O.D. of wiper sleeve at blades .

Key Seat Wiper
(JK)

Specifications - Key Seat Wiper

Model	**Product Code**	O.D. of sub(mm)	O.D. of blade (mm)	I.D. (mm)	Sliding sleeve stroke L (mm)	Connection	Max . work temperature (℃)
JKQ125	JK12500	115	125	38	117	NC31	<200
JKQ178	JK17800	165	178	70	325	NC50	<200
JKQ203	JK20300	188	203	70	325	NC50	<200
JKQ207	JK20700	192	207	70	325	NC50	<200

SERIES 150 OVERSHOT

Series 150 Releasing and Circulating Overshot is an external fishing tool for engage, pack off and retrieve tubular fish, especially for fishing drill collar and drill pipe. The grapple of the overshot can be designed for different sizes of fish, so one overshot can be dressed with different size of grapple components for fishing different sizes of fish.

Construction

Series 150 Overshot consists of three outside parts: Top Sub, Bowl, and Standard Guide. The Basic Overshot may be dressed with either of two sets of internal parts, if the fish diameter is near the maximum catch of the Overshot, a Spiral Grapple, Spiral Grapple Control, and Type “A” Packer are used. If the fish diameter is considerably below maximum catch size (½” or more) a Basket Grapple and a Mill Control Packer are used.

When order please specify:

- The model of the overshot
- The hole, casing size or o.d. of overshot
- Top connection
- O.D of the fish

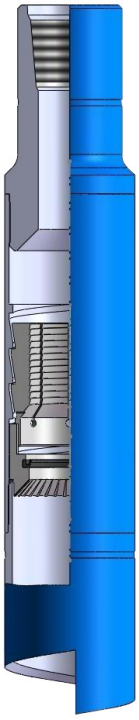
FS = Full Strength
SH = Slim Hole

Basket grapple

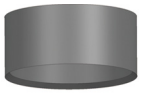
Basket grapple mill control packer

Inner seal

Outer seal

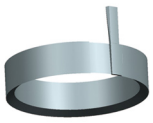


Series 150 Overshot with Basket Grapple



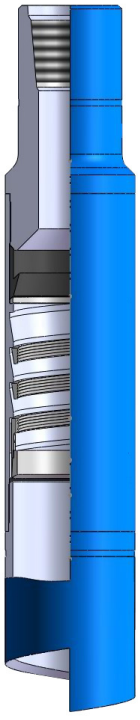
A Packer

Spiral grapple



Spiral grapple control

Series 150 Overshot (L01)



Series 150 Overshot with Spiral Grapple

Specifications - series 150 overshot

Model	Product Code	O.D (mm)	Max.catch size(mm)		API Connection	Model	Product Code	O.D. (mm)	Max.catch size(mm)		API Connection
			Spiral grapple	Basket grapple					Spiral grapple	Basket grapple	
LT-T89	L01-1100	89	60.3	47.6	NC26	LT-T194	L01-2400	194	159	141	NC50
LT-T92	L01-1200	92	73	63.5	NC26	LT-T200	L01-2500	200	159	141	NC50
LT-T95	L01-5100	95	76.2	66.6	NC26	LT-T206	L01-2600	206	178	163	NC50
LT-T102	L01-1300	102	73	60.3	NC26	LT-T206A	L01-2700	206	168	152	NC50
LT-T105	L01-1400	105	85.7	73	NC31	LT-T219	L01-2900	219	178	159	NC50
LT-T114	L01-1500	114	89	75	NC31	LT-T232	L01-3000	232	203	187	NC50
LT-T117	L01-3800	117	89	78	NC31	LT-T244	L01-3100	244	203	184	6 5/8 REG
LT-T127	L01-1600	127	95	80	NC38	LT-T260	L01-3200	260	219	200	6 5/8 REG
LT-T143	L01-1700	143	120.6	108	NC38	LT-T270	L01-3300	270	228.6	209.6	6 5/8 REG
LT-T152	L01-2000	152	128	114	NC38	LT-T273	L01-3400	273	241.3	216	6 5/8 REG
LT-T168	L01-2100	168	127	114	NC50	LT-T286	L01-3500	286	244.5	225.4	6 5/8 REG
LT-T168B	L01-2200	168	139.7	120.6	NC50	LT-T298A	L01-3600	298	257	238.1	6 5/8 REG
LT-T181	L01-2300	181	146	127	NC50	LT-T340	L01-3700	340	286	263	6 5/8 REG

SERIES 150 OVERSHOT ACCESSORIES

Series 150 Releasing and Circulating Overshot can be equipped with a wide range of accessories to meet a variety of complex fishing environmental.

Extension Sub

An extension sub is assembled between the top sub and the bowl.It is used when the upper portion of the fish is damaged or cannot be engaged. This accessory will permit the overshot to be lowered far enough over the fish to ensure secure engagement and pack off. They are available in lengths from 24 to 60 inches. When ordering, specify overshot O.D. Unless otherwise specified Extension Subs will be furnished in a standard 36-inch length.

Extension Sub

Wall Hook Guide

Wall Hook Guide

If the fish is positioned in a washed out section of the hole, it may be difficult to engage the top of the fish using a conventional overshot guide. A wall hook guide can be used to capture the neck of the fish, centralize it, and then properly guide the fish into the bowl.

Oversize / Cut Lip Guide

Oversized Guide properly guides the fish into the overshot when the hole size is considerably larger than the diameter of the fish and the overshot may pass alongside the fish without engaging it. Installation of an oversized guide instead of a standard guide will ensure alignment of the fish with the overshot.

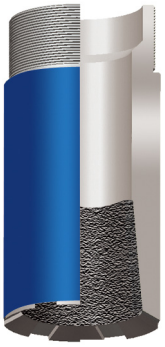
Oversize Guides

Mill Extension

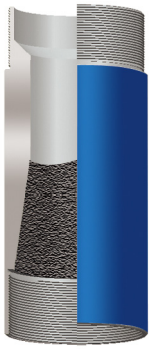
Overshot Mill Extension interiors are faced with Itcoloy to a size that will mill away a flared or jagged fish to enable it to pass up into and be engaged by the Grapple in the Bowl. Mill Extensions are installed between the Bowl and the standard, oversize or wall hook guides.

Mill Guide

Overshot Mill Guides are designed to remove badly flared or jagged metal from the top of the fish. Mill Guides are used in place of the Standard or Oversized Guide to trim the fish so it can enter the overshot.



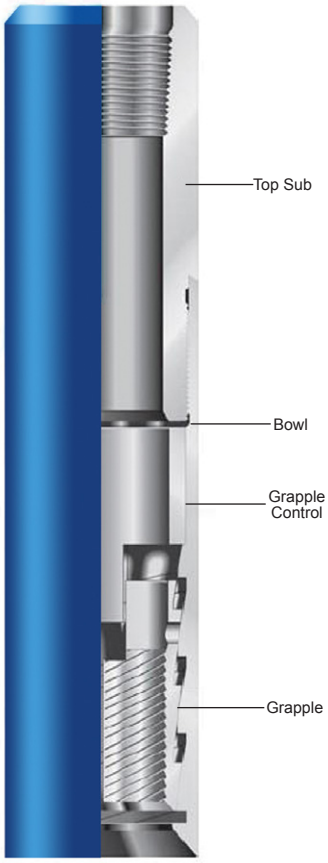
Mill Guide



Mill Extension

SERIES 70 SHORT CATCH OVERSHOT

The Series 70 Short Catch Overshot is an external fishing tool designed to retrieve tubular fish when the top of the fish is too short to be engaged with other overshot. The Grapple Control is positioned above the Basket Grapple rather than below it to allow the Basket Grapple to occupy the lowest position in the Bowl. This enables the overshot to firmly engage and retrieve a very short fish.



Series 70 Short Catch Overshot (L04)

Construction

The Series 70 Short Catch Overshot assembly consists of a Top Sub, Bowl, Basket Grapple Control, and a Basket Grapple. Although the Series 70 Overshot has no Guide, the components function in the same manner as the standard Series 150 Releasing and Circulating Overshot.

Catching the Fish

Attach the Overshot to the bottom end of the fishing string and run it into the hole. Series 70 Overshot assembly is rotated to the right and lowered as the fish enters the expandable grapple. With the fish in the Grapple, stop right-hand rotation and exert an upward pull to fully capture the fish.

Releasing the Fish

A sharp downward force (bump) is applied to the Overshot to break the hold of the grapple within the bowl. The Overshot is then rotated to the right while it is slowly elevated to release the Grapple from the fish.

When order please specify:

The model of the overshot.
The hole, Casing size or O.D. of overshot
Top connection
O.D of the fish
Note:We can design overshot according to customers' request

Specifications - Series 70 Short Catch Overshot

Model	Product Code	O.D. (mm)	Max. fishing size (mm)	Connection BOX	Type
DYLT-T92	L04-9200	92	63.5	2 3/8REG	S.H.
	L04-9210			NC26	
DYLT-T95	L04-9500	95	66.6	2 3/8REG	S.H.
	L04-9510			NC26	
DYLT-T105	L04-10500	105	77.7	2 7/8REG	S.H.
	L04-10510			NC26	
DYLT-T111	L04-11100	111	85.7	2 7/8REG	S.H.
	L04-11110			NC31	
DYLT-T117	L04-11700	117	77.7	2 7/8REG	F.S.
	L04-11710			NC31	
DYLT-T119	L04-11900	119	92.8	2 7/8REG	S.H.
	L04-11910			NC31	
DYLT-T121	L04-12100	121	95.2	NC31	S.H.
	L04-12110			NC38	
DYLT-T133	L04-13300	133	104.8	NC31	F.S.
	L04-13310			NC38	
DYLT-T143	L04-14300	143	92.8	NC31	F.S.
	L04-14310			NC38	
DYLT-T150	L04-15000	150	120.6	NC38	S.H.
DYLT-T159	L04-15900	159	133.3	4 1/2REG	S.H.
	L04-15910			NC38	
DYLT-T200	L04-20000	200	158.7	NC50	F.S.
DYLT-T210	L04-21000	210	165.1	NC50	F.S.
	L04-21010			6 5/8REG	
DYLT-T247	L04-24700	247	203.2	6 5/8REG	F.S.
DYLT-T254	L04-25400	254	209.6	6 5/8REG	F.S.
DYLT-T286	L04-28600	286	228.6	6 5/8REG	F.S.

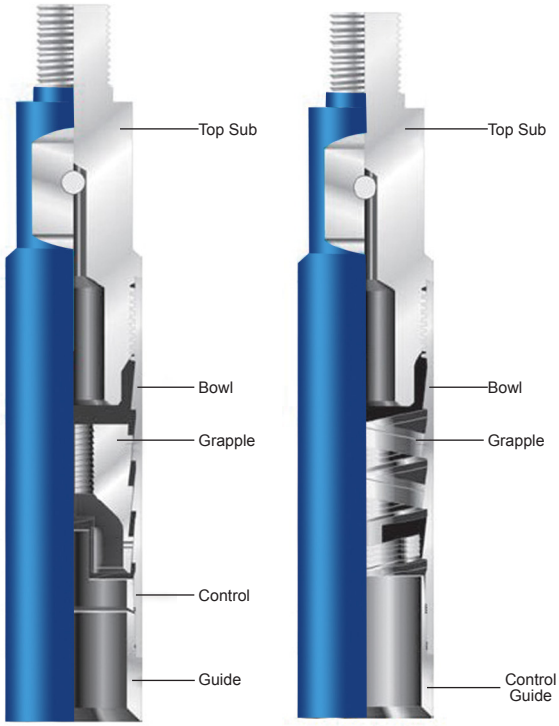
SERIES 10 OVERSHOT

The Series 10 Sucker Rod Overshot is a professional fishing tool, designed for engaging and retrieving sucker rods, couplings, and other
tubular from inside tubing strings.

The Series 10 Sucker Rod Overshot consists of a Top Sub, Bowl, Grapple, and a Guide. According to the size of the fish, there are two types of grapples available: Basket Grapple or Spiral Grapple. The Series 10 is a simple tool to use, no matter whether engaging or releasing , in fact just need to rotate the fishing string on right hand.

Engaging a Fish
When overshot nears the top of the fish, slowly rotate to the right as the overshot is lowered over the fish. After the fish is engaged,allow right-hand torque to release from the fishing string. Then raise the fish by pulling upward on the fishing string.

Releasing a Fish
Bump down or drop the weight of the fishing string against the Overshot to break the hold of the grapple within the Bowl. Elevate the fishing string while slowly rotating it to the right until the Overshot has cleared the fish.



Series 10 Overshot with Basket Grapple

Series 10 Overshot with Spiral Grapple

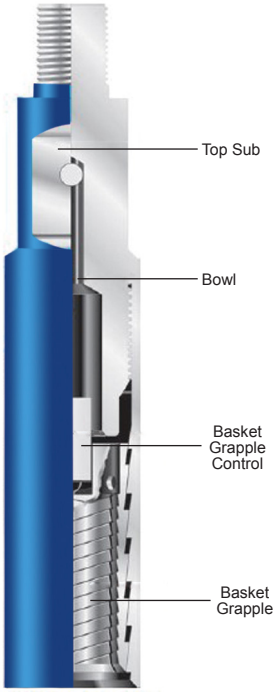
Series 10 Overshot (L03)

SERIES 20 OVERSHOT

The Series 20 Short Catch Sucker Rod Overshots are designed for conditions when sucker rods, couplings, and other portions of a fish are too short for retrieval with a standard overshot.

The Series 20 Short Catch Sucker Rod Overshot consists of a Top Sub, Bowl, Basket Grapple Control, and a Basket Grapple. The Grapple Control is located at the top end of the tool between the Top Sub and the Basket Grapple. The position of the Grapple Control above the Basket Grapple rather than below it allows the Basket Grapple to occupy the lowest position in the Bowl.

This permits the exposed part of the fish to enter the Basket Grapple where it can be firmly and securely grasped. Operation of the Series 20 Short Catch Sucker Rod Overshot is the same as the Series 10 Sucker Rod Overshot.



Series 20 Overshot (L22)

DLT-T RELEASING AND REVERSING OVERSHOT

Type DLT-T Releasable Reversing Overshot, has many advantages owned by various overshot, box tap and the like, Its distinguishing features are as follows: to unscrew and recover the stuck fish: To release the fish down hole if necessary, to circulate fluid as one of the accessories for reversing tools, it is widely used in well servicing.

Releasing and Reversing Overshot (L07)

Structure and application

Consisting of a top sub, spring, bowl, retaining seat, slip, control key, seal ring, seal seat, guide and so on. The upper end of top sub is connected with other tools and drill tool: The lower end of top sub is connected with bowl equipped with spring in the interior,There are three control keys uniformly distributed in the inner wall of the upper end of the bowl, the control keys are used to control the position of retaining seat, Three keys are inserted separately in three grooves in the tapered interior section of lower end in bowl where three keys are used to transmit torque, The tapered interior section produces a pinch force against the slip to effect the fishing operation. The reversed operation can be effected when three keys transfer the torque from bowl to slip.The inclined angle among three control keys play an important role in retaining of slip conforming with bowl to ensure that the tools can be released easily from fish.

The retaining seat is installed at the upper end of external bowl where three keys are placed, the retaining seat not only can slide axially but also rotate round axial line so as to move with slip which is installed in internal circular recess.

Specifications - Table 1 connection LH

Model	O.D. (mm)	Max. fishing size (mm)	Allowed pull(KN)	Releasing pull & allowed torque		Connection (BOX LH)	Product Code
				Pull (KN)	Torque (N.m)		
DLT-T95×48	95	48.3	250	120	3100	2 7/8REG	L07-4800
DLT-T105×60	105	63.5	350	150	5750	NC31	L07-6000
DLT-T114×73	114	78.6	420	180	7750	NC31	L07-7300
DLT-T134×89	134	93.2	500	180	10250	NC38	L07-8900
DLT-T145×102	145	101.6	700	200	11050	NC38	L07-10200
DLT-T160×114	160	114.3	900	200	12150	NC38	L07-11400
						2 7/8REG	L07-11410
DLT-T185×127	185	127	1200	240	13500	NC50	L07-12700
DLT-T200×140	200	139.7	1500	240	15300	NC50	L07-14000

Specifications - Table 2 connection RH

Model	O.D. (mm)	Max. fishing size (mm)	Allowed pull(KN)	Releasing pull & allowed torque		Connection (BOX LH)	Product Code
				Pull (KN)	Torque (N.m)		
DLT-T105×60F	105	63.5	350	150	5750	NC31	L07-6010
DLT-T114×73F	114	78.6	420	180	7750	NC31	L07-7310
DLT-T134×89F	134	93.2	500	180	10250	NC38	L07-8910
						NC31	L07-8920
DLT-T160×114F	160	114.3	900	200	12150	NC38	L07-11420

LIFTING-LOWERING AND RELEASING OVERSHOT

Lifting-Lower and releasing overshot is used to retrieve fractured tubing and drill string with the added advantage that it can be released and the tool backed offl by bumping drill string down and lift directly off of the stuck fish.
The excellent advantage of the product is no need rotating, only through lift and lower, complete catching and releasing fish, It is convenient for the mini-maintenance.

Lifting-lowering and Releasing Overshot (L05)

Structure

The Lifting-lower and releasing overshot is composed of top sub, bowl, guide pin, guide sleeve, joint sleeve,plug, roller pin, slip, guide, as shown in the figure. Box thread of top sub is connected with drill stem, pin thread is connected with the bowl, The bottom of the bowl is connected with the guide, An inner cone in the bowl matches the slip, Box thread of guide sleeve is connected with joint sleeve, track trenches are milled on another outer surface: three long trenches and three short trenches act as guiding and reversing ,When guide pin locates in long trench is in the condition of fish ,When guide pin locates in short trench is in the condition of release, Joint sleeve is two petals formation ,It makes slip and guide sleeve connection and by roller pin act as bearing, The inner surface of slip has fish thread, guide is on the bottom and can make fish introduce into slip successfully.

Working Principle

The tool complete fishing and releasing fish through long, short track trenches. When the tool reaches the top of fish, lower and let it enter the fish, Through lift or lower, guide pin is in the position of long or short trench, slip is in the situation of fishing or releasing, in the condition of non-rotating complete fishing and releasing fish.

Specifications - Lifting-Lowering and Releasing Overshot

Model	Product Code	O.D.(mm)	Connection	Catch Size(in)
TFLT48	L05-4800	95	NC26	1.9
TFLT60	L05-6000	105	NC31	2 3/8
TFLT73	L05-7300	115	NC31	2 7/8
TFLT89	L05-8900	134	NC38	3 1/2
TFLT114	L05-11400	150	NC38	4 1/2

RELEASING SPEAR

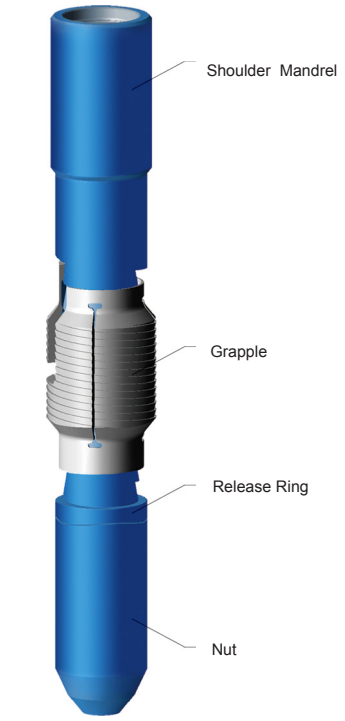
The Releasing Spear provide a positive means to engage and retrieve an internal fish from the well. It is ruggedly built to withstand severe jarring and pulling strains. It engages the fish over a large area without damage of the fish. The simple design avoids the problem of small parts lost or damaged in the hole when operation. It may be used with other equipment such as pack-off assemblies and internal cutters. If the fish cannot be pulled, the spear may easily be released and disengaged.

Construction

The Releasing Spear consists of a mandrel, grapple, releasing ring, and a bull nose nut.The mandrel is made of specially heat treated high strength alloy steel; and may be ordered either as a flush type to enter completely into a fish or as a shoulder type to provide a positive landing position on top of the fish. Size and type of the upper box connection is provide according to customer's exact specification.

When order please specify:

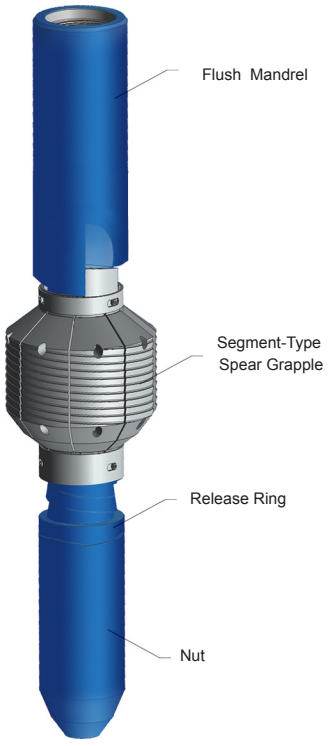
- The model of the releasing spear.
- Top connection
- The exact size and weight of the fish
- Flush or shoulder type mandrel



Spear Assembly
with Shoulder Type Mandrel

Specifications - Releasing Spear

Model	Product Code	Mandrel O.D (mm)	Catch size (mm)	Thread Conn.	Allowed Load (KN)
LM-T60	L02-110	86	47.4-51.8	NC26	270
LM-T73	L02-120	105	57.4-62	NC31	380
LM-T89	L02-130	121	70-77.8	NC38	650
LM-T102	L02-140	121	82-90.1	NC38	800
LM-T114	L02-150	121	92.4-103.9	NC38	1000
LM-T127	L02-160	165	102-115.8	NC50	1300
LM-T140	L02-170	165	118.6-127.3	NC50	1500
LM-T168	L02-180	165	140-153.7	NC50	2200
LM-T178	L02-190	165	150.4-166.1	NC50	2200
LM-T194	L02-200	165	168.3-178.5	NC50	2300
LM-T219	L02-210	197	190.8-205.7	6 5/8 REG	2300
LM-T245	L02-220	197	216.8-228.7	6 5/8 REG	2500
LM-T273	L02-230	197	240-258.9	6 5/8 REG	2500
LM-T340	L02-240	197	313.6-323	6 5/8 REG	2500



Spear Assembly
with Flush Type Mandrel

RELEASING SPEAR ACCESSORIES

Segment-Type Spear Grapple

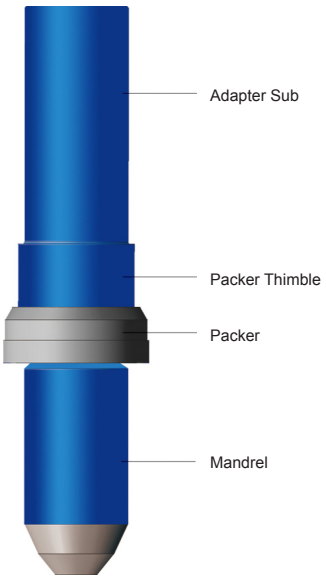
The Segment-Type Spear Grapple enhances the spear's usefulness by providing an extended catching range beyond the maximum range of the standard one-piece grapple. The Segment-Type Spear Grapple is used in place of the standard one-piece Grapple on the 9 5/8" Spears to convert them to spears capable of engaging up to 20" Casing

Segment-Type Spear Grapple consists of a grapple body, eight grapple segments, two retainer rings, six retainer ring screws, six retainer ring spacers, and sixteen grapple segment screws.

Segment-Type
Spear Grapple

Pack-off Assembly

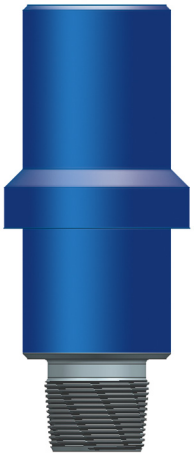
Pack-off Assembly is available for all Spear Assemblies and is designed to efficiently pack-off all sizes of tubing and casing. Circulation through the fish is enabled by attaching the Spear Pack-off Assembly to the bottom of the spear with a sub type nut.



Spear Pack-off Assembly

Spear Stop Sub

The Releasing Spear Stop Sub Assembly is an accessory designed to convert a releasing spear with a flush-type mandrel into a shouldered type spear. It is installed in the box connection at the top of the mandrel when the use of a positive stop is desired or required. A stop ring can be added to increase shoulder diameter. All stop rings are furnished with left-hand threads.



Stop Sub

Optional Nuts

Mill Type to mill away burrs, Sub Type to connect and run other tools below the Spear, and Side hill Type to center the spear in greatly oversize holes to assure entry of the Spear into the fish.

Sub Type Nut

Mill Type Nut

Sidehill Type Nut

Stop Ring

REVERSING SUB

The reversing sub is also referred to as a reversing spear used for reversing stuck drill stem above stuck point in drilling and work over operalion. In treatment of stuck drill stem, it can work as a fishing pin tap in reversing operation, When fish is stuck or can not be reversed in fishing or reversing operation, the fish can be reversed from reversing sub and the fishing drill tool is tripped out.

Reversing Sub
(L08)

Specifications - Reversing sub

Model	O.D (mm)	I.D. (mm)	Thread Conn (LH)	Catch Thread (RH)	Product Code
DKJ105	105	14	NC31	NC31	L08-10500
DKJ105	105	18	NC31	2 7/8NU	L08-10510
DKJ121	121	20	NC38	NC38	L08-12100
DKJ140	140	20	NC40	NC40	L08-14000
DKJ159	159	28	NC46	NC46	L08-15900
DKJ165	165	28	NC50	NC46	L08-16500
DKJ165	165	28	NC50	NC50	L08-16510
DKJ165	165	32	NC50	5 1/2FH	L08-16520
DKJ178	178	32	5 1/2FH	5 1/2FH	L08-17800
DKJ190	190	32	NC50	6 5/8REG	L08-19000
DKJ203	203	32	NC50	NC61	L08-20300
DKJ203	203	32	NC50	6 5/8FH	L08-20310
DKJ203	203	32	NC50	7 5/8REG	L08-20320

Specifications - Reversing sub

Model	O.D (mm)	I.D. (mm)	Thread Conn (RH)	Catch Thread (LH)	Product Code
DKJ105A	105	14	NC31	NC31	L08-10520
DKJ121A	121	20	NC38	NC38	L08-12110
DKJ146A	146	25	4 1/2FH	4 1/2FH	L08-14600
DKJ168A	168	28	NC50	NC50	L08-16800
DKJ168A	168	28	NC50	NC46	L08-16810
DKJ178A	178	32	5 1/2FH	5 1/2FH	L08-17810
DKJ178A	178	32	NC50	NC56	L08-17820

Specifications - Reversing sub

Model	O.D (mm)	I.D. (mm)	Thread Conn (RH)	Catch Thread (RH)	Product Code
DKJ93B	93	18	2 7/8EU	2 7/8EU	L08-9300
DKJ105B	105	14	NC31	NC31	L08-10530
DKJ114B	114	28	3 1/2EU	3 1/2EU	L08-11400
DKJ121B	121	18	NC38	NC38	L08-12120
DKJ140B	140	20	NC40	NC40	L08-14010
DKJ165B	165	28	NC50	NC46	L08-16530
DKJ165B	165	28	NC50	NC50	L08-16540
DKJ178B	178	32	5 1/2FH	5 1/2FH	L08-17830
DKJ178B	178	32	NC50	NC56	L08-17840
DKJ210B	210	32	6 5/8FH	6 5/8FH	L08-21000

REVERSING SPEAR

In drilling and work over operation,the reversing spear is a tool mainly used for fishing of drill pipe,oil pipe and casing from fish hole.It can also be designed for compatability with our internal cutter ,bumper jar etc.

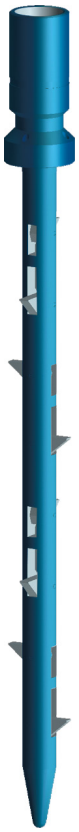
Specifications - Reversing Spear

Model	O.D. (mm)	Connection BOX LH	ID (mm)	Min. fishing size (mm)	Lead-in diameter of spear rod (mm)	Product Code
DLM-T48	95	NC26	7	39.7	37	L10-4800
	86					L10-4810
DLM-T60	105	NC31	8	49.7	46.5	L10-6000
	95.3	2 7/8REG				L10-6010
DLM-T73	105	NC31	8	62	56	L10-7300
	127	NC38				L10-7310
	95.3	2 7/8REG				L10-7320
DLM-T89	105	NC31	16	75	71	L10-8900
DLM-T102	121	NC38	16	88.2	83	L10-10200
	105	NC31				L10-10210
DLM-T114	121	NC38	16	99.8	93	L10-11400
DLM-T127	127	NC38	20	107	98	L10-12700
		NC31				L10-12710
DLM-T140	140	NC31	25	118	107	L10-14000
		NC38				L10-14010
	160	NC50				L10-14020
DLM-T178	178	NC50	30	150.4	142	L10-17800
		NC38				L10-17810
DLM-T245	245	6 5/8REG	70	213.5	205	L10-24500
DLM-T273	273	6 5/8REG	70	232.6	215	L10-27300
		NC50				L10-27310
DLM-T340	344	6 5/8REG	76	313.6	253	L10-34000
		NC50				L10-34010

Reversing Spear (L10)

CABLE FISHING HOOK

The cable fishhook is used primarily to catch electric pump cables or wirelines and has been used to catch bent sucker rods.



cable fishhook
(L16)

Specifications - Cable Fishhook

Outside size (mm)	Product Code	Connection	Catch	For Casing size (in)
ϕ 120 x 1800	L16-14000	NC31	Electric cables	5 1/2 Casing
ϕ 140 x 1800	L16-16800	NC31	Electric cables	6 5/8 Casing
ϕ 150 x 1800	L16-17800	NC38	Electric cables	7 Casing

SLIDING BLOCK SPEAR

The Sliding Block Spear is an internal fishing tool which is not only used for fishing of fallen objects perforated such as drill pipe,tubing,wash pipe ,liner ,packer etc but also for reversing of stuck or fallen objects or used with other tools such as jar and back-off tool.

Sliding Block Spear
(L12)

Specifications - Sliding Block Spear

Model	Product Code	O.D. (mm)	Connection (BOX)	I.D. (mm)	Dia. of spear rod (mm)	I.D. of fish (mm)	O.D. of fish (in)	Length (mm)
HLM-SS60	L12-4600	121	NC38	12(Side bore)	46	49.66	2 3/8	1200
	L12-4610	89	NC26	12(Side bore)	46	49.66		800
	L12-4700	79	2 3/8REG	12(Side bore)	47	50.7		1000
HLM-SS73	L12-5100	105	NC31	12(Side bore)	51	54.6	2 7/8	1200
	L12-5500	79	2 3/8REG	12(Side bore)	55	62		2800
	L12-5700	121	NC38	12(Side bore)	57	62		1200
	L12-5710	105	NC31	12(Side bore)	57	62		1200
	L12-5720	89	NC26	12(Side bore)	57	62		1000
HLM-SS89	L12-6500	121	NC38	15(Side bore)	65	70.2	3 1/2	1200
	L12-6510	105	NC31	15(Side bore)	65	70.2		1200
	L12-7000	121	NC38	15(Side bore)	70	76.2		1200
	L12-7010	105	NC31	15(Side bore)	70	76.2		1200
HLM-SS114	L12-8600	122	NC31	18(Side bore)	86	90-95	4 1/2	1200
	L12-8800	168	NC50	18(Side bore)	88	92.5-97.2		1200
	L12-9100	122	NC31	18(Side bore)	91	97.2-103.9		1200
	L12-9110	122	NC31	18(Side bore)	91	97.2-103.9		1500
	L12-9120	168	NC50	18(Side bore)	91	97.2-103.9		1200
HLM-SS127	L12-9700	168	NC50	18	97	101.6-116	5	1200
HLM-SS140	L12-10800	141	NC31	18	108	114.3-121.4	5 1/2	1200
	L12-11200	168	NC38	20	112	118.6-124.3		1265
Note: Unless required specially, the length is 1200mm.								

TAPER TAP & DIE COLLARS

The taper tap range is designedspecifically for tubular dropped objects such as drill pipe and tubing.It has proven a highly effective tool in fishing of tubular dropped objects. The taper tap can be used for different fishing operation when equipped with left hand thread or right hand thread drill pipes and other tools. The taper taps are made from high strength alloy steel forging materials and heat treated.It is made with chip groove to ensure exacting ability to cut threads.

Specifications - Taper Tap

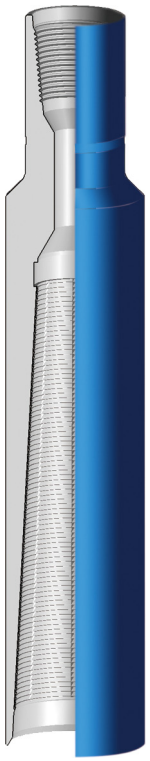
Model	Product Code	Fishing OD of big end (mm)	Fishing OD of small end (mm)	ID (mm)	OD (mm)	Overall length (mm)	Overall length (in)
GZ47×28-NC26	L19-02000	47	28	10	86	565	1.9Tubing
GZ60×38-NC26	L19-02001	60	38	12	86	635	2 3/8Tubing
GZ70×45-NC26	L19-02002	70	45	16	86	680	2 7/8Tubing
GZ86×56-NC31	L19-03000	86	56	20	105	760	3 1/2Tubing
GZ98×65-NC38	L19-05000	98	65	25	121	810	4Tubing
GZ110×77-NC50	L19-09000	110	77	25	168	810	4 1/2Tubing
GZ62×40-NC26	L19-02003	62	40	16	86	635	2 3/8Drill pipe 2 7/8Drill pipe
GZ85×60-NC31	L19-03001	85	60	25	105	680	3 1/2Drill pipe
GZ109×79-NC50	L19-09001	109	79	25	168	760	4Drill pipe 4 1/2Drill pipe
GZ130×95-NC50	L19-09002	130	95	38	168	840	5Drill pipe 5 1/2Drill pipe
GZ160×145-NC50	L19-09003	160	145	51	168	520	6 5/8Drill pipe
GZ122×92-NC50	L19-09004	122	92	38	168	760	4 1/2Casing 5Casing
GZ135×109-NC50	L19-09005	135	109	51	168	700	5 1/2Casing
GZ162×137-NC50	L19-09006	162	137	51	168	680	6 5/8Casing
GZ172×147-6 5/8REG	L19-19000	172	147	51	197	680	7Casing
GZ187×161-6 5/8REG	L19-19001	187	161	51	197	700	7 5/8Casing 7 3/4Casing
GZ215×185-7 5/8REG	L19-20000	215	185	51	229	760	8 5/8Casing
GZ237×211-75/8REG	L19-20001	237	211	51	229	700	9 5/8Casing
GZ85×52-NC31	L19-03002	85	52	20	105	810	φ76.2-φ57.2(mm)

Taper Tap
(L19)

DIE COLLARS

The die collar is used as a specialised external fishing tool which is taps thread on the outside wall of tubing objects such as tnbing and drill pipe.

The die collar range consists of sub and tap body with threads in interior of cone as shown in the fig I. The die collar is made of high strength alloy and is made with a cutting groove in the fishing threads thus enabling effective threading.



Taper Tap
(L19)

Specifications - Die Collar

Model	Product Code	Fishing OD of big end (mm)	Fishing OD of small end (mm)	Max. OD (mm)	OD of joint (mm)	Overall length (mm)	Catch size (mm)
MZ55×40-NC26	L20-02000	55	40	86	86	410	48
MZ68×50-NC26	L20-02001	68	50	95	86	550	60
MZ80×62-NC26	L20-02002	80	62	114	86	560	73
MZ96×74-NC31	L20-03000	96	74	127	105	640	89
MZ110×90-NC38	L20-05000	110	90	143	121	610	102
MZ122×102-NC38	L20-05001	122	102	162	121	620	114
MZ135×110-NC50	L20-09000	135	110	175	168	690	121 127
MZ148×128-NC50	L20-09001	148	128	190	168	630	140
MZ167×140-NC50	L20-09002	167	140	203	168	740	152 159
MZ178×153-6 5/8REG	L20-19000	178	153	211	203	720	165 168 172
MZ190×166-6 5/8REG	L20-19001	190	166	219	203	720	178
MZ210×185-6 5/8REG	L20-19002	210	185	247	203	760	197 203
MZ239×216-7 5/8REG	L20-20000	239	216	280	241	720	228
MZ251×229-7 5/8REG	L20-20001	251	229	290	241	720	241

INTERNAL HOOK & EXTERNAL HOOK

The internal hook is used specifically for fishing of all kinds of ropes and others fish debris such as wireline,cable, logging wireline etc.

The intemal hook is available in various structural designs according to the different fish to be caught, generally we have two types: dead hook and live hook type. Though we pride ourselves in custom tools also.

Internal Hook
(L23)

Specifications - Internal Hook

Model	Product Code	O.D.(mm)	Connection	For Casing/Tubing size(in)
NG73	L23-7300	73	2 3/8 Tubing coupling	3 1/2 Tubing
NG95	L23-9500	95	NC26	4 1/2 Tubing
NG114	L23-11400	114	NC31	5 1/2 Casing
NG136	L23-13600	136	NC31	6 5/8 Casing
NG150	L23-15000	150	NC38	7 Casing
NG176	L23-17600	176	NC38	8 5/8 Casing
NG190	L23-19000	190	NC38	9 5/8 Casing

The External Hook is designed to be used inside casing or tubing to catch all kinds of ropes,lifting bails,hollow short cylinders,short rope slings such as wirelines,logging steel pieces,cables,etc.

External Hook
(L24)

Specifications - External Hook

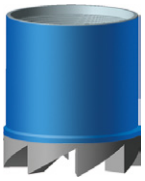
Model	Product Code	O.D.(mm)	Connection	For Casing/Tubing size(in)
WG73	L24-7300	73	2 3/8 Tubing coupling	3 1/2 Tubing
WG95	L24-9500	95	NC26	4 1/2 Tubing
WG114	L24-11400	114	NC31	5 1/2 Casing
WG136	L24-13600	136	NC31	6 5/8 Casing
WG150	L24-15000	150	NC38	7 Casing
WG176	L24-17600	176	NC38	8 5/8 Casing
WG190	L24-19000	190	NC38	9 5/8 Casing

REVERSING CIRCULATION JUNK BASKET

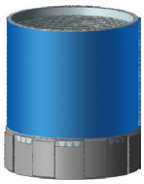
The Reverse Circulation Junk Basket (RCJB) is designed to remove all types of small junk objects from the hole. The tool's main feature eliminates pulling a wet string. Even when the tool is fitted with a magnet insert, reverse circulation is maintained.

Operation

The RCJB is made up to the bottom of the fishing string and lowered to a point within several feet from the bottom of the hole. Begin circulation to wash the hole. Stop circulation and drop the steel ball. (When the steel ball is dropped into the valve seat, circulation fluid travels outward and downward through the inner passage of the barrel and out through the lower ports. The fluid is then deflected to the center of the tool and up through the return holes in the upper end of the barrel. This reverse fluid circulation carries the junk into the barrel above the junk catcher.) Begin circulation again, slowly rotating while lowering the tool until a 10-inch core has been cut. Stop rotation and circulation and pull the tool from the hole.



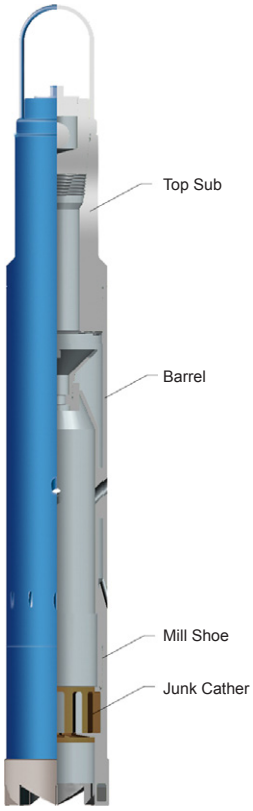
type b mill shoe



type c mill shoe

magnet inert

finger shoe



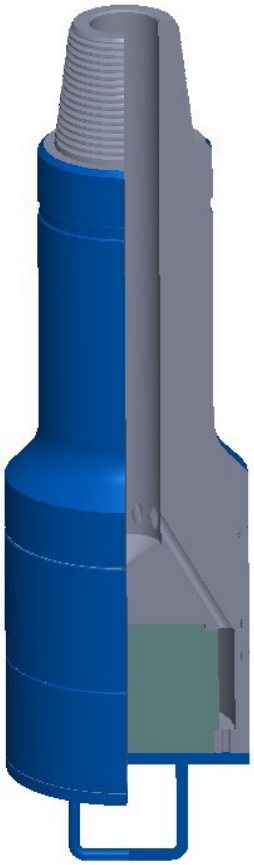
Reverse Circulation Junk Basket (L11)

Specifications - Reverse Circulation Junk Basket

Model	OD of barrel (mm)	Max. fishing size (mm)	OD of steel ball (mm)	Connection (BOX)	Hole size (mm)	Product Code
LL-F381	381	279	57	6 5/8REG	406-444	L11-381000
LL-F330	330	249	57	6 5/8REG	349-406	L11-330000
LL-F301	301	216	57	6 5/8REG	320-346	L11-301000
LL-F279	279	211	57	6 5/8REG	298-317	L11-279000
LL-F257	257	194	57	6 5/8REG	273-295	L11-257000
LL-F232A	232	179	57	NC50	244-270	L11-232000
				6 5/8REG		L11-232100
LL-F206	206	157	45	NC50	216-241	L11-206000
LL-F200A	200	154	42	NC50	212-241	L11-200000
				4 1/2REG		L11-200100
LL-F200	200	147	42	NC50	212-241	L11-200200
LL-F178	178	130	42	NC50	190-210	L11-178000
				4 1/2REG		L11-178100
LL-F159	159	120.6	34	4 1/2REG	168-187	L11-159000
LL-F146A	146	111	34	NC38	155-165	L11-146000
				3 1/2REG		L11-146100
LL-F146	146	105	40	NC38	155-165	L11-146200
LL-F130	130	95.2	34	NC31	143-152	L11-130000
				3 1/2REG		L11-130100
LL-F123	123	90.5	28	NC31	130-140	L11-123000
				2 7/8REG		L11-123100
LL-F121	121	90	34	NC31	130-140	L11-121000
LL-F114	114	77.8	28	NC31	117.5-127	L11-114000
				2 7/8REG		L11-114100
LL-F102	102	63.5	23	NC26	105-114	L11-102000
				2 3/8REG		L11-102100
LL-F97	97	62	30	NC26	108-114	L11-97000
LL-F92	92	57	23	NC26	95.2-102	L11-92000
				2 3/8REG		L11-92100
LL-F89	89	57	23	NC26	95-102	L11-89000

STANDARD FISHING MAGNET

The S-Fishing Magnet is a junk retrieval tool designed to retrieve small metal, oddly-shaped objects such as milling shavings, bit cones, cutters, bearings, slips, tong pins, and hand tools from the bottom of the hole. Typically,these objects are the result of bit failures, an accumulation of mill cuttings, or simply accidental droppings of unmillable objects. In almost all of these cases, the fish cannot be engaged in the normal manner. Fishing magnets can successfully remove these objects from the hole. The tool's design features generous circulation ports that wash away cuttings and other debris that might interfere with or prevent contact with the magnet. A variety of guides are available to accommodate any retrieval situation.



Standard
Fishing Magnet
(L25)

Construction

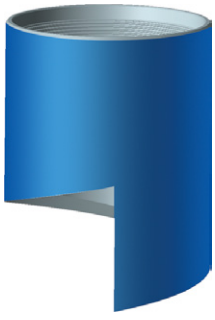
The Fishing Magnet Assembly consists of top sub, housing, magnet element, pole plate, and standard flush guide. The body is manufactured from high strength alloy steel. The magnet element is a powerful permanent magnet. Used properly, it will never lose its charge. The magnet body, housing, and pole plate are threaded and welded together during assembly with the magnet element in place.The standard flush bottom guide is threaded and easily removed.

Operation

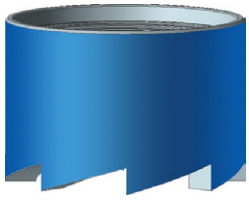
Fishing Magnets are usually run on tubing or drill pipe, but can be run on wireline. Wireline adapters are available. The Fishing Magnet is made up to the bottom of the fishing string and lowered into the hole to within six to twelve inches of the fish. Circulate to wash the fish. Reduce circulation and lower the fishing magnet to the fish. Slowly rotate to ensure positive contact. Discontinue circulation and lift the fishing magnet from the hole.

Optional Accessories

A flush guide is standard. Lipped guides and mill guides are also available. The lipped guide centralizes the fish to assure contact with the magnet. The mill guide enables milling of any soft formation or settling to free debris at the bottom of the hole.



Cut-Lipped Guide



Mill-Type Guide

Wireline Adapter

REVERSE CIRCULATION FISHING MAGNET

The Reverse Circulation Fishing Magnet is based on the Standard Fishing Magnet. It combines the advantages of a Reverse Circulation Fishing Basket and Fishing Magnet. Its unique reverse-circulation design brings better performance on cleaning bottom hole.

Construction

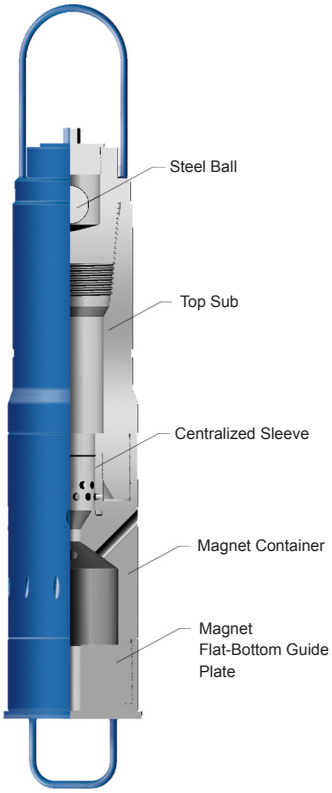
The Reverse Circulation Fishing Magnet Assembly consists of lifting bail, top sub, housing, magnet element, pole plate, standard flush guide, and steel ball. When using we can select appropriate guide.

Operation

Run the fishing magnet in a place which approximate 40 inches from the bottom of hole. Circulate to wash the fish, reduce circulation and lower the fishing magnet to the bottom of hole to attach the fish. Slowly rotate to ensure positive contact. Lift up 10 to 20 inches, drop the steel ball into the fishing string, and pump the steel ball into ball seat. Rotate and circulate for a moment, discontinue circulation and lift the fishing magnet from the hole.

Optional Accessories

A flush guide is standard. Lipped guides and mill guides are also available.



Reverse Circulation Fishing Magnet (L09)

Specifications - Reverse Circulation Fishing Magnet

Model	Product Code	O.D. (mm)	Thread Conn.	Attracted Weight (kg/ cm2)	Temperature In well	Hole Size (mm)
CLF89	L0903100	89	NC26	9.8	210	95~110
CLF100	L0905100	100	NC26	9.8	210	110~135
CLF125	L0912100	125	NC38	9.8	210	135~165
CLF140	L0914100	140	NC38	8.5	210	150~175
CLF146	L0915100	146	NC38	8.5	210	160~185
CLF152	L0916100	152	NC38	8.5	210	160~185
CLF178	L0918100	178	NC50	7.8	210	185~210
CLF190	L0919100	190	NC50	7.8	210	200~225
CLF200	L0920100	200	NC50	7.6	210	210~235
CLF203	L0921100	203	NC50	7.6	210	215~240
CLF225	L0923100	225	NC50	7.5	210	235~270
CLF254	L0927100	254	6 5/8 REG	7.0	210	265~311
CLF265	L0928100	265	6 5/8 REG	6.9	210	275~330
CLF292	L0933100	292	6 5/8 REG	6.9	210	300~442
CLF317	L0935100	317	7 5/8 REG	6.9	210	340~375
CLF356	L0937100	356	7 5/8 REG	6.9	210	444.5
CLF406	L0940100	406	7 5/8 REG	6.9	210	444.5~660

DITCH MAGNET

The ditch magnet is the best available and most effective means of trapping and removing metal particles from the drilling mud that the shale shaker will not get This unit will capture all metals having magnetic attraction and hole them until they can be removed from the mud stream. The magnet is particularly valuable during milling operations.Removal of mill cuttings and debris reduces wear of mud pumps and other equipment,as well as eliminating problems caused by the return downhole of harmfal debris. They are equally effective during washover and fishing jobs.

Structure

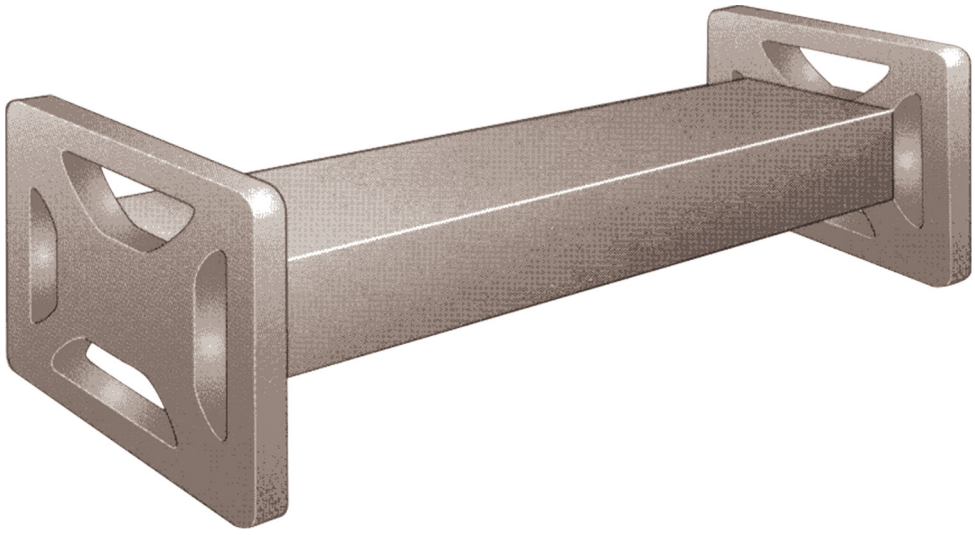
The ditch magnet is made of a highly performance magnet. It features simplicity, strong magnet field, ruggedness and high power to weight ratio.

Operation

No special instructions are required to operate the ditch magnet. It is most effective when suspended by soft line in the mud ditch. It may also be suspended by soft line in the shaker discharge. When the cuttings or debris are enough and need to he removed,take off the magnet and open the inserting plate from the end with pull rod,pull out the magnet pole body,the cuttings and debris will drop down. The magnet body shall be cleaned with fresh water and assemble again for use.

Maintenance

The unit should be cleaned several times per day depending on millings rate. Just remove the Magnet and clean with fresh or salt water hose. Wipe all cuttings from the unit and return it to duty.The unit may be cleaned less often during other operations when return cuttings come slower.



Ditch Magnet
(L26)

Specifications - Ditch Magnet

Outslde dimension (mm)	Magnetic effective area (mm)	Strength in magnetic pole surfaced Gs	Strength from 10mmm to magnet pule surface Gs	Weight Kg	Product Code
200×620	L260200	125×500	1400	700	L260200

JUNK MILLS

Flat Bottom Junk Mill

The Flat Bottom Junk Mill is the most commonly used milling tool. It is designed to milling a wide variety of junk such as squeeze tools, packers, tubing, bridge plugs and similar objects.

Flat bottom junk mill
(M08)

Tapered Mills

The Tapered Mill is designed for milling through various types of downhole obstructions, and for reaming out liners and whipstock windows. It works well in collapsed casing as well as tight spots.

Tapered Mill
(M11)

Concave Junk Mills

The Concave Mill designed for milling bit cones and other loose objects where it is necessary to keep the fish centered under the mill for greater effectiveness.

Concave Bottom
Junk Mill
(M04)

Economill

The Economill is a effective tool for light duty milling jobs such as packers, bridge plug, and cement. This mill can be easily made up and broken out with standard bit breakers.

Econo mill
(M25)

Bladed Junk Mill

Bladed junk mills are dressed with high-quality tungsten carbide to ensure optimal performance in all applications. They are suitable for all types of general junk milling, as well as for removing packers, retainers, and squeeze tools.

Bladed Junk Mill
(M26)

String Junk Mill

The String Mill is designed to clean out casing and whipstock windows. Their short leading and trailing angles, allow the mill to clean "bird nest" and other obstructions in the string, while the bottom hole tool is milling. This string mill assures that the milled section maintains full gage.

String Junk Mill
(M27)

Pilot Mill

The Pilot Mill is best used for milling stuck tubular, such as liner, liner hanger, wash pipe, rotary shoe etc. The pilot assembly maintains a centered position on the tubular, while the milling blades mill the product away. We provide custom built pilot mill assemblies for packer milling operations.

Pilot Mill
(M12)

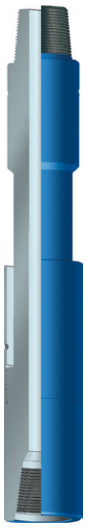
Skirted Junk Mill

The Skirted Junk Mill is designed to milling tubular fish, either inside casing or in open hole. Should the fish be plugged, it is far better to use a shoe-type guide with a flat mill to avoid sidetracking.

Skirted Junk Mill
(M22)

JUNK SUB

During drilling process, drilling fishing cup is applled mainly for fishing of shivers and fallen objects such as carbide tooth, drill bit and bearing which can not be carried out of hole by conventional fluid circulation, etc It possesses important functions to keep hole toe cleaning, increase bit service life, reduce and prevent drill bit from unexpected damage.



Junk Sub
(L14)

Structure

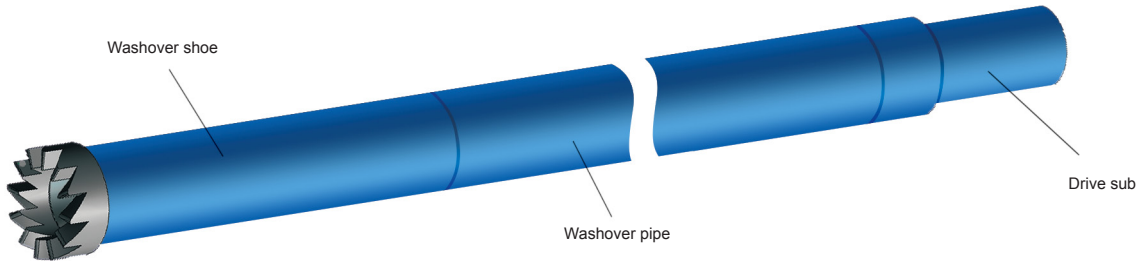
Due to the fact that the O.D. of external bowl of fishing cup is bigger and a smaller circular space is available between extemal bowl of fishig cup and well hole; the mandrel diameter at cup mouth is larger so that it has a bigger annular space, therefore, the fluid at the cup mouth form a swirls and suddenly fall down so as to reduce the carrying capacity. By this way, some heavy objects will drop in cup and be fished out so that the purpose of cleaning ofhole toe is carried out.

Specifications - Junk Sub

Model	OD of lower end × OD of upper end (mm)	Bottom Conn. × Top Conn.	ID (mm)	L of cup (mm)	OAL (mm)	Hole size (mm)	Product Code
LB79	79×79	2 3/8REG B*P	19	250	845	88.9-98.4	L14-7900
LB89	89*78	2 3/8REG B*P	19	250	845	108-117.5	L14-8900
LB94	94*79	2 3/8REG B*P	19	250	850	108-117.5	L14-9400
LB102	102*93	2 7/8REG B*P	31.8	250	850	117.5-124	L14-10200
LB114	115*105	3 1/2REG B*P	38.1	250	915	130-149	L14-11400
LB118	118*105	3 1/2REG B*P	38.1	250	875	139.7-149	L14-11800
LB127	127*108	3 1/2REG B*B	38.1	250	850	152.4-162	L14-12700
LB127	127*108	3 1/2REG B*P	38.1	250	915	152.4-162	L14-12710
LB133	133*121	3 1/2REG B*NC38 B	38.1	250	775	152.4-162	L14-13300
LB133	133*108	3 1/2REG B*P	38.1	250	915	152.4-162	L14-13310
LB133	133*121	3 1/2REG B*NC38 P	38.1	250	875	152.4-162	L14-13320
LB133	133*121	NC38 P*B	38.1	250	875	152.4-162	L14-13330
LB140	140*121	3 1/2REG B*NC38 B	38.1	250	775	165-190.5	L14-14000
LB140	140*108	3 1/2REG B*P	38.1	250	850	165-190.5	L14-14010
LB140	140*121	NC38 B*P	50.8	250	915	165-190.5	L14-14020
LB146	146*121	3 1/2REG B*NC38 B	38.1	250	915	168-190.5	L14-14600
LB146	146*108	3 1/2REG B*P	38.1	250	875	168-190.5	L14-14610
LB165	165*152	4 1/2REG B*NC46 B	57.2	250	915	190.5-216	L14-16500
LB165	165*140	4 1/2REG B*P	57.2	250	915	190.5-216	L14-16510
LB168	168*146	4 1/2REG B*B	57.2	250	915	190.5-216	L14-16800
LB168	168*152	4 1/2REG B*NC46 B	57.2	250	915	190.5-216	L14-16810
LB168	168*140	4 1/2REG B*P	57.2	250	915	190.5-216	L14-16820
LB178	178*159	4 1/2REG B*NC50 B	57.2	250	915	219-244.5	L14-17800
LB178	178*165	4 1/2REG B*NC50 B	57.2	250	915	219-244.5	L14-17810
LB178	178*159	4 1/2REG B*NC46 B	57.2	250	915	219-244.5	L14-17820
LB178	178*146	4 1/2REG B*P	57.2	250	915	219-244.5	L14-17830
LB178	178*165	NC50 P*B	57.2	250	940	219-244.5	L14-17840
LB194	194*165	4 1/2REG B*NC50 P	71.4	250	950	229-273	L14-19400
LB219	219*178	6 5/8REG B*NC50 B	76.2	250	915	244-289	L14-21900
LB219	219*197	6 5/8REG B*P	76.2	250	915	244-289	L14-21910
LB219	219*203	6 5/8REG B*P	76.2	250	915	244-289	L14-21920
LB241	241*203	6 5/8REG B*P	76.2	250	950	292-330	L14-24100
LB245	245*203	6 5/8REG B*B	76.2	250	915	292-330	L14-24500
LB245	245*203	6 5/8REG B*P	76.2	250	950	292-330	L14-24510
LB245	245*203	6 5/8REG P*B	76.2	250	940	292-330	L14-24520
LB273	273*203	6 5/8REG B*P	76.2	250	945	330-375	L14-27300
LB327	327*241	7 5/8REG B*B	76.2	250	950	375-444.5	L14-32700
LB327	327*241	7 5/8REG B*P	76.2	250	965	375-444.5	L14-32710
LB327	327*241	7 5/8REG P*B	76.2	250	1040	375-444.5	L14-32720

WASHOVER PIPE

Washover pipe is a special tool to release the stuck section of drillstring in the well bore. We offer a complete range of washover pipe in the industry. Our unique FJWP thread is a two-step double shoulder thread which assure quick make up and high torsion strength.



Specifications - Washover Pipe

Model	Product Code	O.D	I.D	Wall Thickness	Min. Hole Size	Max. Mill Size	Max. Tensile Load kN	Connection Field Torque N.m	Seak Oressyre Mpa.
		mm							
TXG114.30-8.56	L21-190	114.30	97.18	8.56	120.65	80.90	390	9490	20
TXG127-9.19	L21-230	127.00	108.62	9.19	146.05	101.60	440	12202	20
TXG139.70-9.17	L21-270	139.70	121.36	9.17	152.4	117.48	500	14914	20
TXG146.05-7.92	L21-300	146.05	130.21	7.92	161.93	127.00	500	14914	20
TXG146.05-9.00	L21-320	146.05	128.05	9.00	161.93	120.65	560	16269	20
TXG168.28-8.94	L21-380	168.28	150.39	8.94	187.33	142.88	600	21693	15
TXG177.80-9.19	L21-420	177.80	159.42	9.19	200.03	152.40	640	24404	15
TXG193.68-9.53	L21-490	193.68	174.63	9.53	212.73	168.28	700	31183	15
TXG193.68-10.92	L21-500	193.68	171.83	10.92	212.73	165.10	810	36607	15
TXG193.68-12.70	L21-510	193.68	168.28	12.70	212.73	161.93	1060	43386	15
TXG203.20-9.53	L21-530	203.20	184.15	9.53	215.90	177.00	820	32539	15
TXG206.38-9.40	L21-540	206.38	187.58	9.40	215.90	177.80	830	32539	15
TXG219.07-11.43	L21-600	219.07	196.21	11.43	244.48	187.33	1100	47453	15
TXG219.07-12.70	L21-610	219.07	193.67	12.70	244.48	184.15	1220	54232	15
TXG228.60-10.80	L21-620	228.60	207.01	10.80	250.83	200.03	1260	47453	15
TXG244.48-11.99	L21-690	244.48	220.50	11.99	266.70	212.73	1460	67791	15
TXG244.48-13.84	L21-700	244.48	216.80	13.84	266.70	206.37	1560	81349	15
TXG273.05-11.43	L21-720	273.05	250.19	11.43	290.45	238.13	1620	81349	15
TXG273.05-12.57	L21-730	273.05	247.91	12.57	298.45	234.95	1640	88128	15
TXG298.44-12.42	L21-750	298.44	273.60	12.42	323.85	263.53	1800	108465	10
TXG339.72-13.06	L21-760	339.72	313.60	13.06	365.13	301.62	2020	149140	10
TXG406.40-16.66	L21-770	406.40	373.08	16.66	444.50	355.60	2500	254894	7.0

WASHOVER PIPE ACCESSORIES

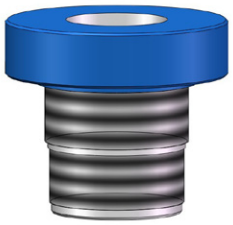
Drive Sub

Drive Subs provide the crossover connection between fishing string and the washover pipe. Each is machined from high-grade alloy steel and heat treated to provide maximum strength and durability.

Drive sub

Lift Plug

Lift Plug is designed to provide an economical method of handling washover strings. It is available in all thread types and size, has sufficient shoulder diameter to support handling the washover string.



Lift Plug

Washover Safety Joint

Washover safety joint is manufactured to provide safe and easy release and make-up whenever disengagement from the washover string becomes necessary. This dependable, field-tough tool is designed to transmit torque in either direction when placed in the washover string.

Washover Safety Joint

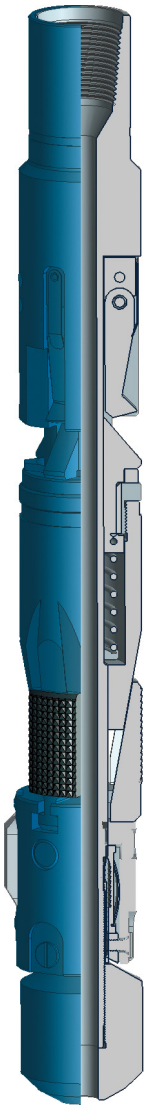
Rotary Shoes

Rotary Shoe are manufactured from specially heat treated alloy to provide the ultimate in toughness and durability. They are used to cut a clearance between the fish and the wall of the well bore.

Rotary Shoe

MECHANICAL INTERNAL CUTTER

The ND-J type internal cutter is a down-hole cutting tool designed to cut casings, tubings and drill pipes mechanically. It owns some advantages of simple structure, reliable performance, high cutting efficiency. In order not to cut casings, tubing couplings, before run in hole, the cutter shall be kept away from collar position, if condition is allowed, it can be used with collar finder. It can be used with releasing spear, the cut off pipe strings can be either pulled out of hole with cutter or caught out by fishing tools alone.



Mechanical Internal Cutter
(X04)

Working principle

When internal cutter is run in estimated depth down-hole, right to rotate mandrel of cutter for three circles so that sliding sleeve separates off sliding sheet. At the time,the friction block closes against pipe wall due to the function of spring, the parts on centralizing body and slips don't rotate in pace with mandrel but move up due to engagement of sliding sleeve and sliding sheet, also at the time, down the drill string the slip diameter is expanded due to sloping function of slip cone-shaped body, the slip bites the inner wall of pipe, then cutter is anchor bolted on pipe wall. In this case, lift up mandrel about 10mm, then lower and rotate mandrel slowly, so that three cutters radial open up depending on cutter push block, cutting operation can be done. The cutting operation is not finished until mandrel press against end Face of thrust ring. When lift up mandrel, under double functions of blade spring and its self-weight, three cutters separate off inclined Face and take back blade edges, additionally, sliding sleeve and slip sheet come back to original engagement depending on slip sheet spring and structure of tooth threads. Meanwhile, the slip cone moves up in pace with mandrel so that slip looses cutting tools bolted on pipe wall and continues to move up until upper cone-shaped face of guide nut with draw against tooth face of locking ring before pull out of tools cut.

When ordering please specify:

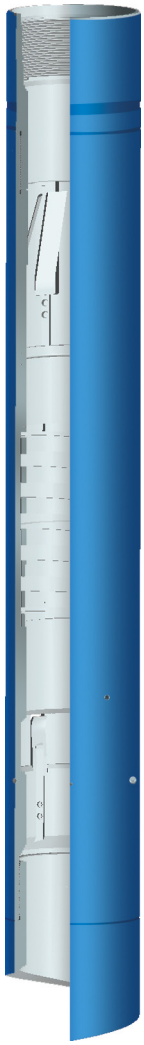
- Pipe size and weight to be cut.
- top connection.

Specifications - Mechanical Internal Cutter

Model	Product Code	O.D. (mm)	Connection BOX	ID (mm)	ID of cut pipe (mm)	OD of cut pipe (in)
ND-J73×55	X04-73000	55	1.9NU	8	59-62	2 7/8
ND-J89×67	X04-89000	67	1.9EU	13	70-78	3 1/2
ND-J114×91	X04-114000	91	NC26	16	97-104	4 1/2
ND-J127×102	X04-127000	102	NC26	18	107-115	5
	X04-127100		2 7/8REG			
ND-J140×112	X04-140000	112	NC31	15	118-128	5 1/2
	X04-140100		2 7/8REG			
ND-J178×145	X04-178000	145	NC38	38	150-166	7
	X04-178100		NC31			
	X04-178200		3 1/2REG			
ND-J245×210	X04-245000	210	NC50	50	216-228	9 5/8

MECHANICAL EXTERNAL CUTTER

WD-J type is are automatic spring-fed cutters that provide fast, efficient,
External cutting and recovery of long sections of tubing, drill pipe, casing, and the corresponding size pipe fish. The spring-fed feature prevents excessive strain from being applied from the rig floor, which could cause the knives to burn or break.



Mechanical
External Cutter
(X05)

Work Principle

After the tool connected with the wash over pipe under to the predetermined cutting position, lift the cutter, the spring dog inside the cutter on the preload sleeve withstands the shoulder of fish sub.
If we continue to lift, the body through shear pins impels feed ring together upward movement, the spring stress compression, When the lift force over shear pins load, shear pins cut off .The spring impels the feed link downward movement: and it could let the knives rotary to the cutter center. Rotary tool, the spring impels the feed ring gradually downward to feed knives with the function the spring elastic potential energy, until the fish cut off, after cut off the fish, the preload sleeve card tight wrap catches the fish which cuts off to extract together.

When ordering please specify

- Hole size;
- Pipe O.D to be cut;
- Top connection.

Specifications - Mechanical External Cutter

Model	Product Code	O.D. (mm)	Dimension of cutting fish (mm)	Max. joint O.D. of cutting fish (mm)	Recommend connection BOX	Lifting fish capacity KN	Shear force of shear pin KN	Axial force of push knife KN
WD-J102×154	X05-102100	154	101.6	121	5 1/2LCSG	20	10-20	10-30
WD-J140×206	X05-140100	206	139.7	165	Users homemade	20	10-20	10-30

MULTI-STRING CUTTER

The Multi-string Cutter is built to withstand extreme shock encountered in cutting multiple strings of uncentralized conductor pipe. Due to the unique construction of this tool, the rugged cutter arms expand outward up to 5 times the diameter of the tool body and achieve maximum stability under all types of adverse cutting conditions, including hard spots, eccentricity, interrupted cuts, etc.

For example, the 13 3/8” casing cutter measures only 11 3/4” diameter and cuts all ranges and weights of pipe through 60”.

Features and Benefits

- Cuts multiple strings smoothly, even the strings are not concentric;
- Affords maximum expansion of blades up to 5 times body diameter;
- Rugged 3-blade construction provides fast cut at high speeds;
- Cutter arms can be changed on rig floor.

When ordering please specify

- Casing size or range to be cut;
- Top connection;
- Body OD.

Muti-String Cutter
(G01)

Specifications - Multi-String Cutter

Model	Product Code	Body O.D(in)	Connection	Casing Range	Optional knives
GD127	G01 127 00	4"	2-7/8REG	5"-9 5/8"	5"
					5"-7"
					5"-9 5/8"
GD140	G01 140 00	4 3/8"	3-1/2REG	5 1/2"-9 5/8"	5 1/2"
					5 1/2"-7"
					5 1/2"-9 5/8"
GD178	G01 178 00	5 3/4"	NC38	7"-16"	7"
					7 5/8"-8 5/8"
					8 5/8"-11 3/4"
					11 3/4"-16"
GD210	G01 210 00	8 1/4"	6 5/8REG	9 5/8"-30"	9 5/8"
					10 3/4"-13 3/8"
					10 3/4"-16"
					13 3/8"-20"
					20"-30"
GD298	G01 298 00	11 3/4"	6 5/8REG	13 3/8"-60"	13 3/8"-16"
					13 3/8"-20"
					13 3/8"-30"
					20"-30"
					20"-36"
					30"-60"

SECTION MILL

Section mills are primarily used to mill sections in the casing for: Sidetracking, gravel packing, and/or perforation zones. The section mill is available in a variety of casing sizes, ranging from 4 1/2" to 13 3/8". The blades are dressed so that all blades simultaneously mill the casing, with the milling rates usually limited by the ability of the fluids to remove the cuttings from the hole.

Section mill

When ordering please specify:

- Tool model
- Size and weight of Casing to be milled
- Top connection

Specifications - Section Mill

Model	DXG114	DXG127	DXG140	DXG168	DXG178
Product Code	D111400	D112700	D114000	D116800	D117800
Casing Size in	4 1/2	5	5 1/2	6 5/8	7
Body O.D in	3 3/4	4 1/8	4 1/2	5 1/2	6
Fishing neck O.D in	2-3/8REG	2-7/8REG	2-7/8REG	3-1/2REG	3-1/2REG

Model	DXG194	DXG219	DXG245	DXG273	DXG298	DXG340
Product Code	D119400	D121900	D124500	D127300	D129800	D134000
Casing Size in	7 5/8	8 5/8	9 5/8	10 3/4	11 3/4	13 3/8
Body O.D in	6 1/2	7 3/8	8 1/4	9 1/4	10	11 1/2
Fishing neck O.D in	3-1/2REG	4-1/2REG	4-1/2REG	6-5/8REG	6-5/8REG	6-5/8REG

TYPE H SAFETY JOINT

H type safety joint, which is installed on the position required for subsurface drill stem and can bear in fishing operation all kinds of loads for pulling or pressing and used to transmit torque,is a subsurface safety equipment.In down hole operation,in case of being needed,the safety joint is easy to be discharged off so as to take out the drill stem above it. It is easy to butt the safety joint to go on fishing operation when running in hole again.

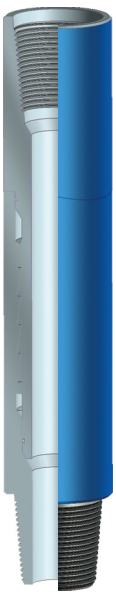
Type H Safety Joint
(A02)

Specifications - H Type Safety Joint

Model	Product Code	O.D. (mm)	I.D. (mm)	Thread Conn
HAJ89	A020890	89	15	NC26
HAJ95	A020950	95	20	NC26
HAJ105	A021050	105	30	NC31
HAJ121	A021210	121	38	NC38
HAJ159	A021590	159	50	NC46 , NC50
HAJ165	A021650	165	50	NC46 , NC50
HAJ178	A021780	178	57	NC50 , 5 1/2FH
HAJ203	A022030	203	71.4	6 5/8 REG

TYPE AJ SAFETY JOINT

AJ type safety joint is a specialized joint consisting of two parts.The specialized joint takes protective effect for drilling stem in drilling ,repairing and test oil (gas)engineering,etc.It is used to treat well bottom accident and used to be on -the -way test in drilling and coring operation. It is connected to the required position of drilling stem to protect drilling stem without any influence on the normal working of drilling tool.



Type AJ Safety Joint
(A01)

Specifications - AJ Type Safety Joint

Model	Product Code	O.D. (mm)	I.D. (mm)	Thread Conn
AJ-C86	A010860	86	38	NC26
AJ-C95	A010950	95	44	NC26
AJ-C105	A011050	105	51	NC31 , 2 7/8NU , 2 7/8EUE
AJ-C121	A011210	121	57	NC38
AJ-C159	A011590	159	71.4	NC46 , NC50
AJ-C165	A011650	165	71.4	NC50
AJ-C178	A011780	178	71.4	NC50 , 5 1/2FH
AJ-C203	A012030	203	76	6 5/8REG
AJ-C228	A012280	228	76	7 5/8REG

IMPRESSION BLOCK

Impression Block is an effective tool used to determine dimensions, configuration, condition, and location of the top end of a fish in the hole.

Construction

Our Impression Blocks are manufactured with a high strength alloy steel body and a soft lead insert at the lower end. All impression blocks are provided with a watercourse for flushing the top of the fish before lowering the tool against it. Impression blocks without a watercourse can be furnished upon request.

Operation

Make up the impression block to the bottom of the fishing string and run into the hole. Do not rotate. Slowly lower the impression block to the point of contact with the fish. Apply weight to the impression block and lift it from the hole.

When ordering, please specify:

- Complete assembly or part number
- Top connection
- Lead O.D.

Impression Block
(X03)

Specifications - Impression Blocks

Specification	Product Code	Thread Connection		I.D.of lead die	Total length
		O.D.	Thread Model (in)		
270	X03-27000	203	6 5/8REG	40	380
225	X03-22500	165	4 1/2IF	40	380
195	X03-19500	159	4 IF	30	370
170	X03-17000	121	3 1/2IF	30	370
120	X03-12000	105	2 7/8IF	20	350
100	X03-10000	89	2 3/8IF	20	350

CONTACT SALES

If you want to learn more about the ERA range of Drill Stem and Fishing Tools and indeed our wider service capability then please feel free to contact us with an enquiry, or indeed with your own downhole or supply problems and we can discuss the best solutions available.

At ERA we focus on reliability, efficiency and simple design geared toward solving your problems and providing you with the level of service, delivery and value your project requires. A level of service quality you will recognise as unparalleled.

As a team, ERA calls upon over 50 years of industry experience across drilling, big hole fishing, coil tubing, wirleine, completions and tubular running services on land, continental shelf and deepwater.

We know your business. We know what level of service excellence you require. Take a look further in the catalogue and see the rigorous QA acceptance, testing and inspection processes that ERA guarantee as part of the manufacturers API, ISO and NS1 Fearnley Proctor certification.

For more information contact us:

Head Office: ERA Oilfield Service (Thailand) Co Ltd., 23rd Floor, Pacific Place 2, 142 Sukhumvit Road, Klong Toey, Bangkok. 10110.

Tel:	**+66 (0) 2 684 6966**	**Bangkok Office**
	+66 (0) 8 4345 8730	**24 hour mobile**
Email:	**Fishing Tools**	**jim.reid@eraoilfieldservices.com**
		par@eraoilfieldservices.com
		downholetools@eraoilfieldservices.com
	General Enquiries	**jim.reid@eraoilfieldservices.com**

QUALITY EXAMINATION

TIANHE has a distinct department for quality inspection, metering and material testing. There are many metalloscopes, profile projectors and carbon and sulfur analyzers which were made in Germany, Japan and Taiwan. All the facilities keep our quality control system's leading position in China and abroad.

① Rockwell hardometer can be used to test material samples' Rockwell hardness(Left). Brinell hardness tester can be used to test material samples' Brinell hardness.(Right)

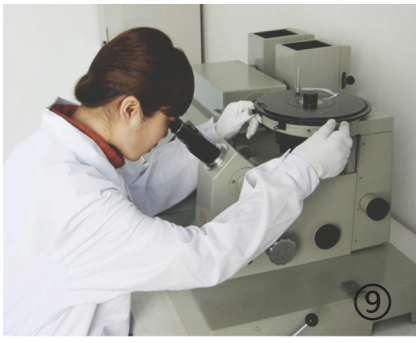
② Global performance 12.30.10 moving bridge three-coordinate measuring machine.

③ Metalloscopes are used for the test and analysis of the metal's metallurgical structure. Before and after heat treatment, the metalloscopes are used to analyze the microstructure of the metal and the quality of carburization.

④ Impact testing machine are necessary in testing mechanical properties of the products and impact value of KA.

⑤ Universal testing machine is used to test the tensile strength, yield strength, compressive strength, extensibility and shrinkage of materials. Universal tester can also provide different type of bending or flex test.

⑥ Micro-full-automatic Carbon & Sulfur Analyzer provides test and analysis of material sample for reagent.



⑦ Magnetic powder flaw detector provides surface inspection of material with fluorescent magnetic particle. It detects and highlights any defects on the surface.

⑧ Profile Projector in the lab provides geometry test for inspection tools and cutters. They are regarded as a precision measuring device in quality control.

⑨ Metalloscopes are used for the test and analysis of the metal's metallurgical structure. Before and after heat treatment, the metalloscopes are used to analyze the microstructure of the metal and the quality of carburization.