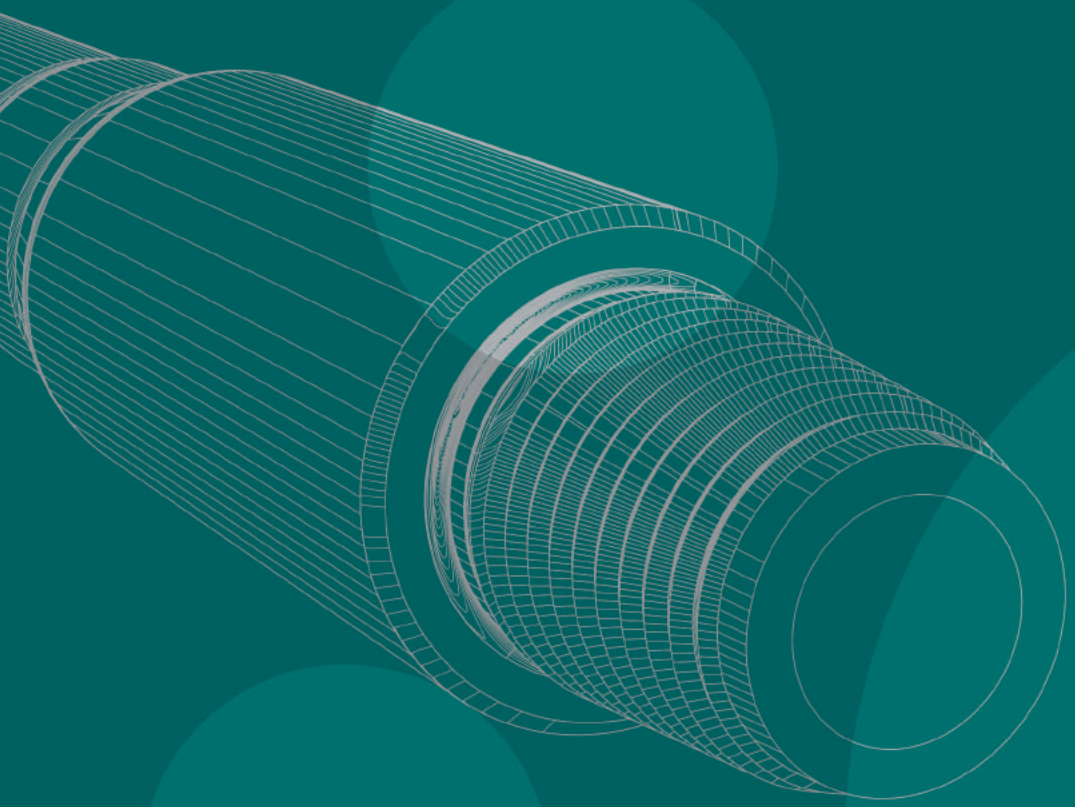


NORTHSTAR

DRILLING TOOLS

HDD PIPES AND TOOLS



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North Star is the world's only manufacturer to offer a comprehensive range of both forged and welded HDD pipe

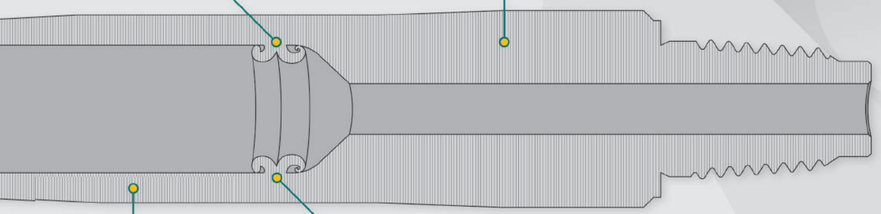
All our pipes and HDD tooling are made at our own purpose-built facilities.

Whatever the work, be it quality control, product development or customer service, our team is guided by one simple aim: to be your first and best choice for HDD pipes and tooling – now and in the future.

WELDED PIPE

Enhanced friction-welding process ensures both strength and durability

Custom heat-treated joints provide superior hardness and wear resistance



Pipe body upset forged to increase weld area

Quality control testing guarantees mechanical consistency of weld

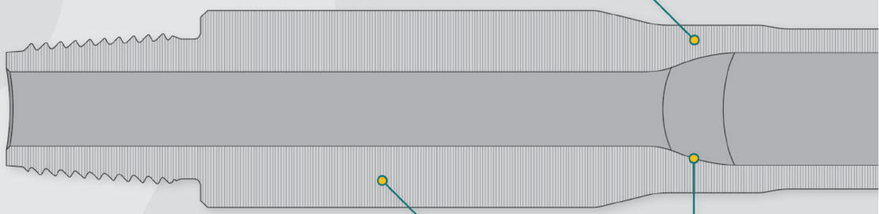
North Star's engineers produced the first HDD pipe in China in 2004: a simple, friction-welded model using a plain-end tube. Through 20 years of field testing and development, North Star's team has refined our welding processes to the point that today's friction-welded models are the most popular choice of our partners and customers in China and throughout Asia – appreciated not only for their durability and reliability, but also their competitive pricing.

VS

FORGED PIPE

From the outside, one forged pipe looks much like another. The differences are all on the inside, where failure to control the key processes of forging and heat treatment can have disastrous consequences. North Star's rigorous quality management ensures consistent high performance from this premium product.

Smooth forge transition zone reduces stress concentration



Fine-grained S135 steel ensures fatigue resistance and long life

100%quality inspection guards against flaws that create stress risers

Why choose North Star Pipes?





US$4 million invested in new equipment since 2020

Strength & Experience

North Star has 20 years' experience in manufacturing HDD pipes for the Chinese and international markets.

Since 2020 we have invested more than US$4 million in upgrading and expanding capacity at our two purpose-built production facilities. The latest additions to our forging, heat treatment and welding lines have consolidated North Star's position as the largest comprehensive manufacturer of forged and friction-welded HDD pipe in the world.

We have also implemented a unique continuous testing program, allowing us to make objective evaluations of new processes and products before they are given final approval.

Service & Product Support

We stand by our products. Our aim is simple: 100% customer satisfaction, and to that end we take every enquiry and every issue with equal seriousness. We work together with our partners and end-users to help ensure they get maximum value from every product. If necessary, we send staff members and engineers on site for further study and training. All our products are fully guaranteed against defects in materials or workmanship.



The North Star team is at **your** service

Quality Control

Our quality team's work begins by ensuring a consistently high standard of raw material: checking every batch on delivery against the technical team's strict criteria for dimensional accuracy and steel chemistry. Once approved for production, every item of material is issued a work number that allows us to track it through every subsequent step of the manufacturing process. The completed product is finally issued and stamped with a serial number that enables 100% traceability of all that manufacturing data.

We break open samples from every batch of pipe to check the steel's mechanical properties are up to S135 standard. Just as importantly, our trained QC staff carry out 100% physical and non-destructive inspections of every forged end. This ensures there are no internal cracks, sharp transitions or underfills – any of which could lead to rapid propagation of stress cracks. No pipe is released to market without a quality report verifying compliance with all destructive and non-destructive testing criteria.

Heat Treatment

North Star's heat treatment processes are conducted 100% in-house, using custom-built quench-and-temper furnaces specifically designed for HDD pipes. This gives us rigorous control over the furnace parameters – especially important when optimizing for specific steel chemistries – and provides a complete data set in the event of any product quality investigation. Post-heat treatment material testing is also done in our own laboratory, with results communicated seamlessly to our technical team for immediate evaluation.



Consistent raw material quality & 100% traceability



Zero-flaw visual and physical inspection standard



S135 mechanical quality testing



Complete control of heat treatment and data traceability

Our aim is simple: 100% customer satisfaction

Upset Forging

As you can see from the graphics on pages 6 and 7, the quality of the forged section is absolutely essential to the finished product, yet the internal structure of this section is completely invisible to the end-user. North Star continually invests in upgrading forging capability. In 2024 we unveil a new workshop featuring the latest and largest expansion of our industry-leading hydraulic forge line.We have designed and built new automated pipe handling systems to improve both speed and accuracy of the forging process, and we have trained quality control staff especially to identify and eliminate flaws in the internal forge section.



Automated systems for speed and accuracy

WELDED DRILL PIPE SPECIFICATION CHARTS

General Pipe Specifications

Pipe OD		Thread	Length		Joint OD		Max. Torque	Recommended Make-up Torque (Nm)	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)
mm	in		mm	ft	mm	in	(Nm)		m	ft			
60	2.375	ZX60 (BDSII)	3,000	9.84	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32
73	2.875	NC23 (BDS)	3,000	9.84	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45
76	3	NC26	3,000	9.84	88	3.465	16,560	9,936	54	177.2	3.1	5.3	53
83	3.25	ZX80	3,000	9.84	92	3.622	20,372	12,223	59	193.6	2.9	4.9	59
			4,500	14.76							4.3	7.3	81
89	3.5	NC31	3,000	9.84	105	4.134	29,407	17,644	64	210	2.7	4.6	71
			4,500	14.76							4	6.9	95
102	4	NC38	4,500	14.76	127	5	39,515	23,709	73	239.5	3.5	6	123
			6,000	19.69							4.7	8	160
114	4.5	NC38	6,000	19.69	127	5	51,573	30,944	82	269	4.2	7.1	165
114	4.5	NC46	6,000	19.69	157	6.181	68,764	41,259	82	269	4.2	7.1	203
127	5	NC50	6,000	19.69	168.3	6.625	108,759	65,255	91	298.6	3.8	6.4	250
			9,600	31.50							6	10.2	350
140	5.5	5 1/2FH	9,600	31.50	190.5	7.5	117,340	70,404	100	328	5.5	9.3	450
168	6.625	6 5/8FH	9,600	31.50	209.6	8.25	120,799	72,480	121	397	4.5	7.7	460

Compatible with Vermeer HDD Rigs

Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Pin Length	Max. Torque	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	inch	mm	inch	(mm)	(Nm)	m	ft				
D7x11, D10x15	#200	1,829	6	42	1.66	48	1.88	50.7	2,040	30.2	99.1	3.5	5.9	10	NS10311
D20x22, D23x30	#400	3,048	10	52	2.06	57	2.25	63.5	3,525	34.3	112.5	5.1	8.7	27	NS10312
D24x40	#600	3,048	10	60	2.38	68	2.63	63.5	5,695	39.6	130	4.4	7.5	32	NS10024
D40x40	#600	4,572	15	60	2.38	68	2.63	63.5	5,695	39.6	130	6.6	11.3	47	NS10012
D33x44, D36x50	#650	3,048	10	60	2.38	70	2.75	63.5	6,800	39.6	130	4.4	7.5	34	NS10023
D33x44, D36x50	#650	4,572	15	60	2.38	70	2.75	63.5	6,800	39.6	130	6.6	11.3	48	NS10058
D36x50, D40x55	#700	3,048	10	67	2.63	79	3.10	76.2	7,457	48	157.5	3.6	6.2	49	NS10059
D36x50, D40x55	#700	4,572	15	67	2.63	79	3.10	76.2	7,457	48	157.5	5.5	9.3	71	NS10060
D50x100, D60x90	#900	3,048	10	73	2.88	83	3.25	88.9	12,202	52	170.6	3.3	5.7	45	NS10006
D50x100, D60x90	#900	4,572	15	73	2.88	83	3.25	88.9	12,202	52	170.6	5	8.5	65	NS10061
D50x100	#900	4,572	15	76	3	83	3.25	88.9	12,202	54.7	179.5	4.8	8.1	78	NS10007
D80x100	#800	4,572	15	89	3.50	92	3.62	88.9	13,560	64	210	4.1	7	99	NS10062
D130x150	#1000	6,096	20	89	3.50	111	4.375	88.9	20,400	64	210	5.5	9.3	140	NS10064

Compatible with Ditch Witch HDD Rigs

Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Pin Length	Max. Torque	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	inch	mm	inch	(mm)	(Nm)	m	ft				
JT2720	1.94	3000	9.84	60	2.38	70	2.75	75	4,340	39.6	130	4.3	7.4	34	NS10002
JT20	1.94	3000	9.84	52	2.06	67	2.63	75	2,980	34.3	112.5	5	8.5	28	NS10268
JT2720M1, JT3020M1	2.11	3000	9.84	60	2.38	76.2	3.00	84.7	5,420	39.6	130	4.3	7.4	36	NS10001
JT25/30	2.11	3000	9.84	60	2.38	70	2.75	84.7	5,420	39.6	130	4.3	7.4	34	NS10269
JT4020	2.40	4500	14.76	73	2.88	82	3.23	99.5	6,800	52	170.6	4.9	8.3	65	NS10073
JT4020M1	2.59	4500	14.76	76	3.00	89	3.50	91.5	6,800	54	177.2	4.7	8	76	NS10033
JT7020M1, JT8020M1, JT100M1	3.27	4500	14.76	89	3.50	102	4	132.5	13,560	64	210	4	6.9	98	NS10075

*Examples only - please contact our sales team to clarify your rig's specific tooling needs. See page 14 for more information on selecting the correct drill pipe.

FORGED DRILL PIPE SPECIFICATION CHARTS

General Pipe Specifications

Pipe OD		Thread	Length		Joint OD		Max. Torque (Nm)	Recommended Make-up Torque (Nm)	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)
mm	in		mm	ft	mm	in			m	ft			
60	2.375	ZX60	3,000	9.84	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32
73	2.875	NC23	3,000	9.84	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46
73	2.875	NC26	3,000	9.84	88	3.465	16,055	9,633	52	170.6	3.3	5.6	56
83	3.25	ZX80	3,000	9.84	92	3.622	20,372	12,223	59	193.6	2.9	4.9	61
83	3.25	ZX80	4,500	9.84	92	3.622	20,372	12,223	59	193.6	4.3	7.3	79

Compatible with Vermeer HDD Rigs

Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Pin Length	Max. Torque	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	inch	mm	inch	(mm)	(Nm)	m	ft				
D7x11, D10x15	#200	1,829	6	42	1.66	48	1.88	50.7	2,040	30.2	99.1	3.5	5.9	10	NS10301
D20x22, D23x30	#400	3,048	10	52	2.06	57	2.25	63.5	3,525	34.3	112.5	5.1	8.7	27	NS10302
D24x40	#600	3,048	10	60	2.38	67	2.63	63.5	5,695	39.6	130	4.4	7.5	32	NS10003
D33x44, D36x50	#650	3,048	10	60	2.38	70	2.75	63.5	6,800	39.6	130	4.4	7.5	34	NS10022
D33x44, D36x50	#650	4,572	15	60	2.38	70	2.75	63.5	6,800	39.6	130	6.6	11.3	48	NS10051
D36x50, D40x55	#700	3,048	10	67	2.63	79	3.10	76.2	7,457	48	157.5	3.6	6.19	49	NS10052
D36x50, D40x55	#700	4,572	15	67	2.63	79	3.10	76.2	7,457	48	157.5	5.5	9.28	71	NS10053
D50x100, D60x90	#900	3,048	10	73	2.88	83	3.25	88.9	12,202	52	170.6	3.3	5.7	45	NS10035
D50x100, D60x90	#900	4,572	15	73	2.88	83	3.25	88.9	12,202	52	170.6	5	8.5	65	NS10004

Compatible with Ditch Witch HDD Rigs

Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Pin Length	Max. Torque	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	inch	mm	inch	(mm)	(Nm)	m	ft				
JT20	1.94	3000	9.84	54	2.13	67	2.63	75	2,980	36	118	4.8	8.1	28	NS10068
JT25/30	2.11	3000	9.84	60	2.38	70	2.76	84.7	5,420	39.6	130	4.3	7.4	34	NS10069





*Examples only - please contact our sales team to clarify your rig's specific tooling needs. See page 14 for more information on selecting the correct drill pipe.

WELDED DRILL PIPE SPECIFICATION CHARTS

Compatible with Chinese HDD Rigs

Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Max. Torque (Nm)	Recommended Make-up Torque (Nm)	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	in	mm	in			m	ft				
DW.TXS															
DDW200	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10048
DDW320	NC23	3,000	9.84	73	2.875	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45	NS10043
DDW3512, DDW400	NC26	3,000	9.84	76	3	88	3.465	16,560	9,936	54	177.2	3.1	5.3	53	NS10046
DDW500	NC31	4,500	14.76	89	3.5	105	4.134	29,407	17,644	64	210	4	6.9	95	NS10034
DDW1000	NC38	6,000	19.69	114	4.5	127	5	51,573	30,944	82	269	4.2	7.1	165	NS10031
DDW1600	5 1/2FH	9,600	31.50	140	5.5	190.5	7.5	117,340	70,404	100	328	5.5	9.3	450	NS10094
XCMG															
XZ180, XZ200	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10083
XZ320, XZ360	NC23	3,000	9.84	73	2.875	82	3.228	13,978	8,387	52	170.6	3.3	5.6	45	NS10084
XZ400	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	2.9	4.9	59	NS10085
XZ400	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	81	NS10086
Goodeng															
GD180	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10115
GD280	NC23	3,000	9.84	73	2.875	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45	NS10116
GD320	NC26	3,000	9.84	76	3	88	3.465	16,560	9,936	54	177.2	3.1	5.3	53	NS10046
GD320, GD380	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	59	NS10085
GD380	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	81	NS10086
Drillto															
ZT16/18	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10047
ZT25	NC23	3,000	9.84	73	2.875	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45	NS10142
Hanlyma															
HL518	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10042
HL532	NC23	3,000	9.84	73	2.875	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45	NS10100
HL536	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	59	NS10085
HL536	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	81	NS10086
Dilong															
DL220	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10164
DL280, DL320	NC23	3,000	9.84	73	2.875	82	3.169	13,978	8,387	52	170.6	3.3	5.6	45	NS10165
DL360	NC26	3,000	9.84	76	3	88	3.465	16,560	9,936	54	177.2	3.1	5.3	53	NS10046
DL450	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	2.9	4.9	59	NS10085

*Examples only. Chinese HDD rigs are often released in non-standard configurations.
Please refer to page 14 "Choosing the Right Pipe" and talk to our sales team to ensure you make the correct selection for your needs.





FORGED DRILL PIPE SPECIFICATION CHARTS

Compatible with Chinese HDD Rigs

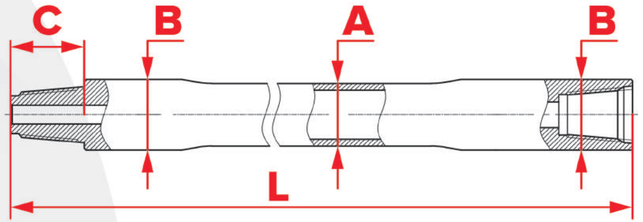
Rig Compatibility*	Thread	Length		Pipe OD		Joint OD		Max. Torque (Nm)	Recommended Make-up Torque (Nm)	Bend Radius		Max. Bend Angle	Max. Slope (%)	Weight (kg)	Part Number
		mm	ft	mm	in	mm	in			m	ft				
DW.TXS															
DDW200	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10008
DDW320	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10010
DW400	NC26	3,000	9.84	73	2.875	88	3.465	16,055	9,633	52	170.6	3.3	5.6	56	NS10009
XCMG															
XZ180, XZ200	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10079
XZ320, XZ360	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10080
XZ400	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	2.9	4.9	61	NS10081
XZ400	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	79	NS10082
Goodeng															
GD180	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10106
GD280	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10107
GD320	NC26	3,000	9.84	73	2.875	88	3.465	16,055	9,633	52	170.6	3.3	5.6	56	NS10009
GD320, GD380	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	61	NS10081
GD380	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	79	NS10082
Drillto															
ZT16/18	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10018
ZT25	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10107
Hanlyma															
HL518	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10025
HL532	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10096
HL536	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	61	NS10081
HL536	ZX80	4,500	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	4.3	7.3	79	NS10082
Dilong															
DL220	ZX60	3,000	9.84	60	2.375	68	2.677	8,294	4,976	39.6	130	4.3	7.4	32	NS10159
DL280, DL320	NC23	3,000	9.84	73	2.875	80.5	3.169	13,978	8,387	52	170.6	3.3	5.6	46	NS10107
DL450	ZX80	3,000	9.84	83	3.25	92	3.622	20,372	12,223	59	193.6	2.9	4.9	61	NS10081

*Examples only. Chinese HDD rigs are often released in non-standard configurations.
Please refer to page 14 "Choosing the Right Pipe" and talk to our sales team to ensure you make the correct selection for your needs.

CHOOSING THE RIGHT PIPE

Making the correct pipe selection is not always as simple as it looks. Chinese HDD rigs in particular may be sold in a wide variety of non-standard configurations, so before making any order for new pipe please make certain you know exactly what you need – especially when it comes to the thread connection.

If in any doubt at all, follow the simple steps below to help our sales staff verify the specifications of your current pipe:



1 Confirm the Drill Rig model, preferably referring to the rig's nameplate as pictured in this example:



2 Note the source of any current pipe. Was it purchased together with the rig or from elsewhere?

If from elsewhere, note the name of the manufacturer or reseller if possible.

3 Record the drill pipe body OD (A), the pipe length (L), the tool joint OD (B) and the pin thread length (C).

4 Note the pipe serial number stamp, which may be located in various parts of the pin or box joint as in the examples below:



CARING FOR YOUR PIPE



Your drill pipe is a significant investment. Much time is lost during drilling projects because of problems that could be avoided with some simple pipe maintenance or improved operational procedures.

If equipment breaks down due to poor maintenance halfway through a bore, it could mean abandoning the hole and starting all over again. The following tips offer a basic checklist to help avoid certain mistakes that are surprisingly common in the field...

When using new drill pipe, ensure the saver sub is also close to new to ensure the best possible connection. Before using the pipe for the first time, remember that each connection should also be made up and broken out three times after proper application of thread grease. This will help avoid wear and galling.



Make up the connection using the manufacturer's recommended make-up torque. Make up gradually to avoid overheating and damaging the thread.

Do not exceed the bend radius parameters of the pipe. Overbending the pipe dramatically shortens its lifespan even if it may not lead to immediate failure.

Rotate the pipe through the drill string from job to job. The lead pipe is subject to relatively greater stress and wear, so change it each time to help ensure even wear throughout your pipe stock.

Do not clamp on any part of the pipe body. This could damage the pipe and reduce its lifespan.

Damaged threads damage connections throughout the drill string. Grease every joint, every time, and check threads after use for dirt or damage. When the pipes are not in use, clean the threads, grease and protect them with a thread cap. Always use professional HDD thread grease and drilling fluids.

Avoid mixing drill pipes from different manufacturers, as variations in manufacturing tolerances may cause problems with makeup and lead to pipe damage. Pipes with a pronounced age difference or obvious difference in the state of wear also should not be mixed.

Check the pipes regularly for wear and tear. Check and change adaptor subs and sub savers in good time: these low-cost items help protect the entire drill string from premature wear.

Use a starter rod between the drill string and the reamer, especially a large reamer.

Drill Tools

North Star's own range of customizable drill heads, reamers and swivels is especially suitable for earth and sandy soil environments. We also manufacture accessories such as starter rods, sub-savers and pulling heads, all of which can be configured to all standard connection types. To discuss your specific needs, please contact your North Star sales representative.



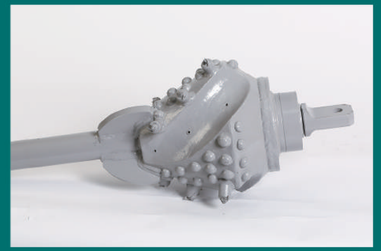
REAMERS

Fluted Reamer

Available both with and without a built-in swivel, this popular general-purpose item's fluted design helps carry slurry smoothly away.



Fluted reamer

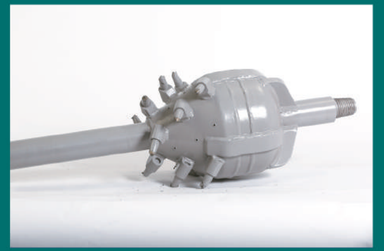


Fluted reamer with built-in swivel

Size (mm)	Swivel	Connection*	Part No.
200	10T Built-in	API 2 3/8 REG-Pulling Eye	NS20018
225	10T Built-in	JT3020M1-Pulling Eye	NS20012
300	20T Built-in	API 2 3/8 REG-Pulling Eye	NS20019
325	10T Built-in	JT3020M1-Pulling Eye	NS20013
400	20T Built-in	API 2 3/8 REG-Pulling Eye	NS20020
500	20T Built-in	API 2 3/8 REG-Pulling Eye	NS20041
600	20T Built-in	API 2 3/8 REG-Pulling Eye	NS20042
750	20T Built-in	NC26-Pulling Eye	NS20273
900	20T Built-in	NC26-Pulling Eye	NS20293

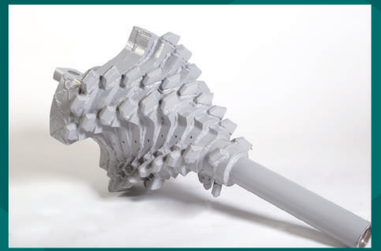
*Examples only. All standard connection configurations are available.

REAMERS



Barrel Reamer

Our top-selling reamer, this item is also available both with and without a built-in swivel. Barrel reamers can be used in conjunction with other reamers to help stabilize and centre the drill string to create a round bore.



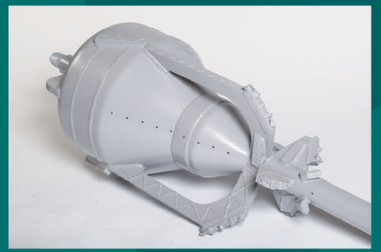
Kodiak-style Reamer

For cobbles and shale conditions, this is a super-tough version of the fluted reamer.



Shredding Reamer

The built-in stabilizing ring helps keep this reamer centred in the bore.



Turbo-style Reamer

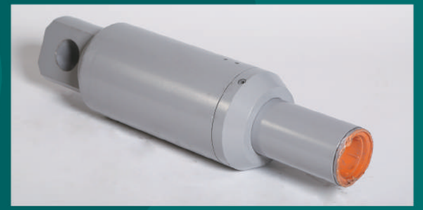
Designed for sand and unstable soils, this blends aggressive cutting with an efficient fluid mixing action.



SWIVELS

Our hard-wearing swivels range from 10 to 100 tons and are available in all clevis, pulling eye and threaded connection styles. Make sure to keep your swivels clean and greased, and never exceed the rated pullback capacity.

Size	OD (mm)	Length (mm)	Connection (example)	Part No.
10T	100	328	Double Clevis	NS20601
20T	128	420	Double Clevis	NS20001
30T	148	466	Double Clevis	NS20036
40T	165	551	Double Clevis	NS20037



API box connection



Double-clevis connection

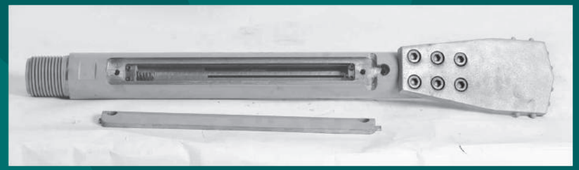
HOUSINGS & ACCESSORIES

With your choice of standard or octagonal connection, side- or end-loading sonde housings, and a wide range of pilot bits in all major bolt patterns, North Star's housing and drill bit assemblies offer flexible, fully customizable solutions.

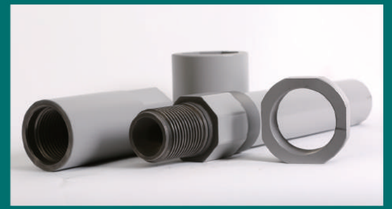
Pipe OD (mm)	Length (mm)	Loading Style	Connection	Bolt Configuration	Part No.
60	585	End	To Order	To Order	NS20002
60	790	Side	To Order	To Order	NS20049
73	614	End	To Order	To Order	NS20032
73	1006	Side	To Order	To Order	NS20031
73	1056	Side	To Order	To Order	NS20006
89	814	End	To Order	To Order	NS20043



End-loading housing



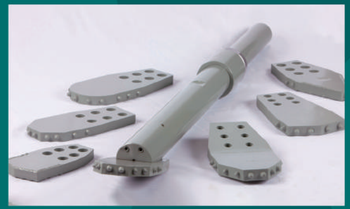
Side-loading housing (open)



Drill-head connection set



Eagle claw bit



Drill head and bits

About North Star



North Star builds on a legacy that began with production of China's first ever HDD drill pipe in 2004.

Today we offer a unique range of both welded and forged pipe: all manufactured 100% in-house at our two purpose-built facilities.





Our program of continuous investment maintains and expands an industry-leading production line capable of manufacturing **more than 300,000 HDD pipes every year.**

North Star is now the clear leader in global production of friction-welded HDD pipe. Our investment is not only in hardware; our **engineering and quality control** teams apply a development philosophy that ensures we are continually testing new materials and new techniques in order to improve our products still further.

In business, we follow a simple philosophy: to pursue long-term, secure relationships underpinned by the values of **partnership, loyalty and integrity**. Our team welcomes you to call, write or visit our offices and factories and meet us in person. Discover more about our way of working and how we can serve your needs.









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DRILLING TOOLS

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