



**DS HOLE ENLARGER(DS 扩孔器—领眼型)**

DS HOLE ENLARGER is a sturdy tool, used to enlarge the borehole beyond bit diameter. It can be opened and closed several times downhole, making it the tool of choice for section enlarging or window opening jobs.

DS扩孔器结构坚固，它用于钻井后的扩眼，可以多次在井下开合工具，可完成选择井段的扩眼或开窗作业。可以提供随钻扩眼器。

It comes with 3 large-section cutting arms, each fitted with two rows of Polycrystalline Diamond Compacts for maximum reaming.

它由3副切割刀翼组成，每副刀翼镶嵌两排强健聚晶金刚石适应大量磨削。

This simple and efficient design, with each arm machined out of a single piece of high-strength alloy, ensures longer tool time at bottom and easy field maintenance.

DS扩孔器结构设计简单且有效，整体刀翼采用高合金钢加工而成，确保了工具的使用时间和易于现场的维修。

Strategically located mud ports provide added cleaning of the PDCs for faster operations with less pack-off risks. 合理泥浆循环孔为刀翼提供了辅助的清洗，提高扩孔速度降低了密封风险。

**When ordering, please specify :订购详细说明**

- Size of the hole to be enlarged.井眼孔尺寸
- Desired hole size after underreaming.扩孔的尺寸
- Connection types.连接丝扣
- Options and accessories (bullnose, hardfacing, extra set of arms, etc.) 可选配置及附件（园头引鞋，表面硬化处理，额外刀翼等）



**石油井下工具设计与制造**

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## Standard dimensions (标准配置尺寸)

Type	Body OD	Hardfacing OD (optional)	Standard cutter arms	Top	Bottom	Nr. of arms
UR550	5 1/2"	6"	7" - 14"	3 1/2 IF	3 1/2 IF	3
UR575	5 3/4"	6"	7" - 14"	3 1/2 IF	3 1/2 IF	3
UR800	8"	8 1/2"	9 1/4" - 18"	4 1/2 IF	4 1/2 IF	3
UR1200	12"	12 1/4"	13 1/2" - 20"	6 5/8 REG	6 5/8 REG	3
UR1700	17"	17 1/2"	19" - 26"	7 5/8 REG	7 5/8 REG	3

*Custom sizes and extra arms sets available on request*

**(刀翼数量及尺寸可以按要求设计)**

DS Industries cutting arms are equipped with two rows of premium PDC cutters. They are designed to maximize cutter life and tool stability while maintaining high ROPs.

DS工业切割刀翼镶嵌两排PDC切割片,该设计可使切割刀最大程度地延长其使用寿命并在高转速时维持工具的稳定。

Cutter gauge features trimmer cutters and TSP impregnated diamond inserts for improved tool stability and undergauge prevention.

保径刀体的特点一边切割刀及热稳定金刚石镶嵌块可改善工具的稳定,防止井眼的缩径。

Each body can be fitted with any size of arms within its opening range. Extra arms can be manufactured and delivered worldwide on short notice.

扩眼器本体可以配套不同尺寸的刀翼,额外的刀翼可以提供制造和分送到世界各地。

Custom bodies can also be manufactured to accommodate for different hole IDs.

扩眼器本体可根据不同的井眼尺寸进行调整设计制造。



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**Technical Specification 护眼器的作业参数**

<b>Parameters</b>	<b>UR575</b>	<b>UR800</b>	<b>UR1200</b>	<b>UR1750</b>
Max FLOW (USG/min) 排量(美加仑/分钟)	350	500	800	1200
Max WEIGHT on bit (metric ton) 钻压(吨)	5	8	15	20
Max WEIGHT on bit (klbs) 钻压(千磅)	11	17.6	33	44
Max TORQUE (daN.m) 最大扭矩 (牛.米)	450	700	1200	1600
Max TORQUE (lbs.ft) 最大扭矩 (磅.英尺)	3,300	5,200	8,800	11,800
ROTATION (RPM) 转速(转/分钟)	Opening : 50 to 80 rpm 打开刀翼的转速 50—80 转/分钟 Enlarging : 80 to 120 rpm 扩眼的转速 80—120 转/分钟			
Make-up TORQUE (daN.m)* 组装扭矩(牛.米)	2000 to 2400	3200 to 3600	5500 to 6000	8000 to 8600
Make-up TORQUE (klbs.ft)* 组装扭矩(磅.英尺)	14.1 to 17.6	23.6 to 26.5	40.6 to 44.3	59.0 to 63.4

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工具作业记录(使用方提供的部分作业记录)

Date	Customer	Country	Field	Job type	UR used	Pilot hole	Arm size	Formation	Reamed	RPM	WOB	ROP	circulation	Comments
		France		Window for plug & abandon	UR575	12"	15"	shale - dolomite	50 M	100 tr/min	2-4 T	5-10 M/hr	120 GPM	Tool piloted by nb stab + bullnose. No significant damage on arms (slight wear).
		France		Window for plug & abandon	UR575	12"	15"	shale - dolomite	50 M	100 tr/min	4 T	10 M/hr	120 GPM	Tool piloted by nb stab + bullnose. Driller reamed into casing after bottom of window. Arms damaged & jammed. Piloting assembly lost in hole. UR closed when entering top casing section, but piston rod showed cracks due to high closing force.
		France		Window for plug & abandon	UR575	8" ?	12"	carbonate ?	45 M	120 tr/min	2-3 T	5-7 M/hr	800 ltr/min	Window opened in 7" casing. Tool piloted by NB stab + bullnose 6 1/2" OD. No significant wear of PDC.
		France		Window for plug & abandon	UR575	11"?	15"	shale	20 M	100 tr/min	2-3 T	7-10 M/hr	1000 ltr/min	Window opened in 7" casing + 9 5/8". Tool piloted by NB stab + bullnose 6 1/2" OD. Some broken PDC inserts on gauge (vibrations ?)
		France		Window for plug & abandon	UR550	8"?	12"	hard limestone	50 M	80-100 tr/m	4 T	4-5 M/hr	650 ltr/min	Window opened in 6 5/8" casing. "Hard" formation. Average wear of PDC. One damaged gauge insert on 2 arms.
		France		Window for plug & abandon	UR550	12"	15"	hard limestone	8 M	80 tr/min	2 T	3-4 M/hr	650 ltr/min	15" reaming of a 12" reamed section. "Hard" formation. Not sufficient stabilisation ( 5 1/2" in 12" hole ! ) caused the tool to fail once it was no longer centered by the top BHA. Destruction of 3 arms by vibrations. One arm LIH. Tool closed but piston rod severely damaged.
		France		Window for plug & abandon	UR575	8"	12"	carbonate ?	50 M	120 tr/min	3-4 T	7-9 M/hr	800 ltr/min	Window opened in 7" casing.
		Spain		Pilot reaming of section	UR800	8 1/2"	9 1/2"	shale - limestone	300 M	100 tr/min	5 T	12-15 M/hr	250 GPM	Section opened in soft to medium formation. 0805 PDC showed average wear. Good piloting by 8 1/2" bit.
		USA		Pilot reaming of section	UR575	6"	7 3/4"	chalk	1900 M - horizontal	?	?	?	?	Arm lost after 1850 M of drilling. Finished the section successfully, but heavy wear on the other arms. Cause : lock pin not tighten properly. Design modified to ease the tightening process.
		USA		Pilot reaming of small section	UR575	6"	7 3/8"	cement	70 M	?	?	?	?	Small section for running expandable liner. OK. No PDC wear.
		Syria		Pilot reaming of section	UR575	6"	7"	medium hardness,	230 M	80 tr/min	2-3 T	~10 M/hr	650 ltr/min	Piloted by 6" tricone. 0803 standard inserts. Some wear on cutting PDC. A few broken gauge PDC (vibrations due to some washout zones ?)
		Syria		RWD	UR 800	8 1/2"	9"	shale and salt	250 M	60-80 tr/min	3-4 T	~15 M/hr	2000 ltr/min	Piloted by NB stab + PDC Bit. Vertical RWD. Use of "new design" premium 1308 arms with reinforced TSP gauge. No damage on the PDC. Some TSP chipped, probably due to vibrations in washouts. Overall very good gauge control on these arms.
		Iran		various usages	UR 800	8 1/2" ?	9 1/2" to	carbonates ?	?	?	?	?	?	"working ok" as per customer. Kept ordering spares.
		Iran		various usages	UR 1200	12 1/4" ?	14 3/4"	carbonates ?	?	?	?	?	?	"working ok" as per customer. Kept ordering spares.
		Iran		surface drilling ?	UR 1750	18"	26"	soft formation	?	?	?	?	?	apparently used as hole opener sometimes.
		Iran		surface drilling	UR1750	17 1/2"	22"	soft formation	150 M	?	?	?	?	Deep offshore job (Caspian sea semi-sub). Finished section but piston rod severely corroded (improper storage before and/or after job ?)
		Poland		Pilot reaming of section	UR575	6"	12 1/4"	medium-hard, lime	75 M	120 tr/min	4 T	1,5 - 6 M/hr	1200 ltr/min	Geothermal well, preparation for gravel pack. Front PDC no wear, Gauge ok, some chipping in angle PDC. Recommend using stabilization pads for next runs to reduce side impacts.

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