

# CleanReam™ Premium Casing-Reaming Bit

Efficiently drills out casing and liner using a robust cutting structure

## Applications

- Liner reaming
- Casing reaming

## Features and Benefits

- The bladed concentric nose provides effective shearing and cutting, and enables optimal face volume for unrestricted cuttings removal. All materials inside the drill-out path, including the ceramic nozzle, can be drilled using polycrystalline diamond cutters (PDCs).
- Shoulder-gauge PDCs form a robust cutting structure that efficiently reams through tight spots and hard ledges. The cutting structure also extends bit life and boosts rate of penetration, which reduces reaming time and minimizes casing fatigue.
- Backreaming capability enables upward reaming through tight sections, which allows the casing to move freely while the next joint of casing is run.
- Primary blades, which extend to the center of the bit, set in cement to prevent spinning while being drilled out. The bit design also reduces drill-out material and enables drilling of completely collapsed holes.

## Tool Description

The Weatherford CleanReam premium casing-reaming bit efficiently reams restrictions during liner and casing installations. It is especially advantageous in wells with long, severely undersized holes.

The long, tapered, bladed concentric nose and long length of the gauges help to avoid sidetracking in soft formations. The nose features aluminum blades dressed with thermally stable polycrystalline (TSP) diamond cutters. The nose is also dressed with TSP diamond cutters, which enables drilling through bridges in the wellbore with unconfined compressive strength of up to 7,000 psi (48.3 MPa).

The CleanReam bit is fitted with interchangeable nozzles to enhance hole and blade cleaning and enable users to adjust the total flow area on-site. The standard nozzles are copper. Upgraded ceramic nozzles are available for long periods of reaming at high flow rates.

Once the reaming run is complete, the bit remains downhole. In preparation for drilling the next section, the nose and nozzles can be drilled out easily using PDC or rock bits.



The CleanReam bit has a robust cutting structure that includes PDCs and a concentric nose dressed with TSP diamond cutters.



# CleanReam™ Premium Casing-Reaming Bit

## Specifications

Blank accessory part numbers	02172244	02151022	02046450	02228458	01325247	01818421 and 01128398
Nominal tool size	3-1/2 × 4-1/4 in.	4-1/2 × 5-5/8 in.	4-1/2 × 5-7/8 in.	5 × 5-7/8 in.	5 × 6-1/4 in.	7 × 8-1/4 in.
Number of blades	3	3	3	3	4	5
Drilling diameter	4.250 in. (107.95 mm)	5.625 in. (142.88 mm)	5.875 in. (149.23 mm)	5.875 in. (149.23 mm)	6.250 in. (158.75 mm)	8.250 in. (209.55 mm)
Casing size	3.5 in. (89 mm)	4.5 in. (114 mm)	4.5 in. (114 mm)	5 in. (127 mm)	5 in. (127 mm)	7 in. (178 mm)
Connection	As requested					
Casing weight range	13 to 16 lb/ft (19 to 24 kg/m)	12 to 15 lb/ft (7 to 22 kg/m)	12 to 15 lb/ft (7 to 22 kg/m)	20 to 24 lb/ft (30 to 36 kg/m)	15 to 21 lb/ft (22 to 32 kg/m)	26 to 32 lb/ft (39 to 48 kg/m)
Casing ID and drift	To API 5CT					
Blank connection ID	Casing drift + 0.04 in. (1 mm)					
Tool length	1.81 ft (0.55 m)	1.88 ft (0.57 m)	1.88 ft (0.57 m)	1.88 ft (0.57 m)	2.03 ft (0.62 m)	2.23 ft (0.68 m)
Fish neck length	6.358 in. (161.5 mm)	6.398 in. (162.5 mm)	6.398 in. (162.5 mm)	6.201 in. (157.5 mm)	7.944 in. (201.8 mm)	9.861 in. (250.5 mm)
Cutting structure	PDC, TSP, HVOF					
Face cutter size	0.35 in. (9 mm)					
Face cutter quantity	3	7	7	8	11	16
Gauge cutter size	0.35 in. (9 mm)					
Gauge cutter quantity	6	5	5	4	9	9
Stabilizer gauge length	5.608 in. (142.4 mm)	4.999 in. (127.0 mm)	4.987 in. (126.7 mm)	5.417 in. (137.6 mm)	5.331 in. (135.4 mm)	4.144 in. (105.3 mm)
Gauge protection	Serrate carbide insert					
Nozzle quantity	3	3	3	3	4	5
Maximum total flow area using ceramic nozzles	0.59 in. <sup>2</sup> (3.80 cm <sup>2</sup> )	0.74 in. <sup>2</sup> (4.81 cm <sup>2</sup> )	0.74 in. <sup>2</sup> (4.81 cm <sup>2</sup> )	0.74 in. <sup>2</sup> (4.81 cm <sup>2</sup> )	0.99 in. <sup>2</sup> (6.41 cm <sup>2</sup> )	1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )
Maximum total flow area using copper nozzles	0.59 in. <sup>2</sup> (3.80 cm <sup>2</sup> )	1.55 in. <sup>2</sup> (10.04 cm <sup>2</sup> )	1.55 in. <sup>2</sup> (10.04 cm <sup>2</sup> )	1.55 in. <sup>2</sup> (10.04 cm <sup>2</sup> )	2.07 in. <sup>2</sup> (13.38 cm <sup>2</sup> )	2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )
Optional valve	None					
Backpressure rating	N/A					
Junk slot area	1.50 in. <sup>2</sup> (9.65 cm <sup>2</sup> )	3.90 in. <sup>2</sup> (25.18 cm <sup>2</sup> )	5.86 in. <sup>2</sup> (37.80 cm <sup>2</sup> )	5.00 in. <sup>2</sup> (32.25 cm <sup>2</sup> )	5.21 in. <sup>2</sup> (33.60 cm <sup>2</sup> )	7.35 in. <sup>2</sup> (47.40 cm <sup>2</sup> )
Tool burst rating	26,000 psi (179 MPa)	14,990 psi (103 MPa)	15,960 psi (110 MPa)	19,250 psi (133 MPa)	19,880 psi (137 MPa)	13,490 psi (93 MPa)
Tool collapse rating	21,170 psi (146 MPa)	13,520 psi (93 MPa)	14,440 psi (100 MPa)	19,800 psi (137 MPa)	17,550 psi (121 MPa)	12,320 psi (85 MPa)
Tool tensile rating	568 kip (2,527 kN)	539 kip (2,398 kN)	573 kip (2,549 kN)	778 kip (3,461 kN)	883 kip (3,928 kN)	1,079 kip (4,800 kN)
Equivalent casing grade	P110	P110	P110	P110	P110	13Cr P110 and P110
Nose material	Aluminum alloy					



# CleanReam™ Premium Casing-Reaming Bit

## Specifications (continued)

Blank accessory part numbers	01374651	02048510	01291315	01311320	01311320	01953285
Nominal tool size	7-5/8 × 8-1/4 in.	7-5/8 × 8-1/4 in.	7-5/8 × 10-1/8 in.	9-5/8 × 12 in.	9-7/8 × 12 in.	11-3/4 × 14-1/2 in.
Number of blades	5					
Drilling diameter	8.250 in. (209.55 mm)	8.250 in. (209.55 mm)	10.125 in. (257.18 mm)	12.000 in. (304.80 mm)	12.000 in. (304.80 mm)	14.500 in. (368.30 mm)
Casing size	7.625 in. (193.68 mm)	7.625 in. (193.68 mm)	7.625 in. (193.68 mm)	9.625 in. (244.48 mm)	9.875 in. (250.83 mm)	11.750 in. (298.45 mm)
Connection	As requested					
Casing weight range	51 to 55 lb/ft (76 to 82 kg/m)	30 lb/ft (44.2 kg/m)	30 to 47 lb/ft (44 to 70 kg/m)	36 to 54 lb/ft (54 to 80 kg/m)	63 to 67 lb/ft (93 to 100 kg/m)	60 to 71 lb/ft (89 to 106 kg/m)
Casing ID and drift	To API 5CT					
Blank connection ID	Casing drift + 0.04 in. (1 mm)					Casing drift + 0.06 in. (1.5 mm)
Tool length	2.30 ft (0.70 m)	2.49 ft (0.76 m)	2.88 ft (0.88 m)	2.69 ft (0.82 m)	2.69 ft (0.820 m)	2.85 ft (0.87 m)
Fish neck length	10.134 in. (257.4 mm)	9.874 in. (250.8 mm)	9.895 in. (251.3 mm)	9.862 in. (250.5 mm)	9.862 in. (250.5 mm)	9.862 in. (250.5 mm)
Cutting structure	PDC, TSP, HVOF					
Face cutter size	0.35 in. (9 mm)	0.24 in. (6 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)
Face cutter quantity	19	11	19	15	15	15
Gauge cutter size	0.35 in. (9 mm)	0.24 in. (6 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)	0.51 in. (13 mm)
Gauge cutter quantity	6	14	6	10	10	10
Stabilizer gauge length	5.441 in. (138.2 mm)	5.780 in. (146.8 mm)	7.169 in. (182.1 mm)	4.957 in. (125.9 mm)	4.957 in. (125.9 mm)	5.700 in. (144.8 mm)
Gauge protection	Serrate carbide insert					
Nozzle quantity	5					
Maximum total flow area using ceramic nozzles	1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )					
Maximum total flow area using copper nozzles	2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )					
Optional valve	None					
Backpressure rating	N/A					
Junk slot area	5.23 in. <sup>2</sup> (33.72 cm <sup>2</sup> )	3.83 in. <sup>2</sup> (24.72 cm <sup>2</sup> )	15.63 in. <sup>2</sup> (100.82 cm <sup>2</sup> )	20.1 in. <sup>2</sup> (129.67 cm <sup>2</sup> )	20.1 in. <sup>2</sup> (129.67 cm <sup>2</sup> )	31.45 in. <sup>2</sup> (202.88 cm <sup>2</sup> )
Tool burst rating	18,950 psi (131 MPa)	5,580 psi (38 MPa)	19,100 psi (132 MPa)	14,776 psi (102 MPa)	14,776 psi (102 MPa)	10,000 psi (108 MPa)
Tool collapse rating	19,580 psi (135 MPa)	5,350 psi (37 MPa)	16,900 psi (117 MPa)	13,357 psi (92 MPa)	13,357 psi (92 MPa)	9,100 psi (98 MPa)
Tool tensile rating	1,824 kip (8,114 kN)	520 kip (2,313 kN)	2,042 kip (9,083 kN)	2,364 kip (10,516 kN)	2,364 kip (10,516 kN)	2,300 kip (10,231 kN)
Equivalent casing grade	P110					
Nose material	Aluminum alloy					



# CleanReam™ Premium Casing-Reaming Bit

## Specifications (continued)

Blank accessory part numbers	02041791		02183108		02393928	
Nominal tool size	13-3/8 x 15-3/4 in.	13-5/8 x 15-3/4 in.	13-3/8 x 17 in.	13-5/8 x 17 in.	9-5/8 x 12 in.	9-7/8 x 12 in.
Number of blades	5		6		5	
Drilling diameter	15.750 in. (400.05 mm)		17.000 in. (431.80 mm)		12.000 in. (304.80 mm)	
Casing size	13.375 in. (339.73 mm)	13.625 in. (346.08 mm)	13.375 in. (339.73 mm)	13.625 in. (346.08 mm)	9.625 in. (244.48 mm)	9.875 in. (250.83 mm)
Connection	As requested					
Casing weight range	61 to 72 lb/ft (91 to 107 kg/m)	88 lb/ft (131 kg/m)	61 to 72 lb/ft (91 to 107 kg/m)	88 lb/ft (131 kg/m)	36 to 54 lb/ft (54 to 80 kg/m)	63 to 67 lb/ft (93 to 100 kg/m)
Casing ID and drift	To API 5CT					
Blank connection ID	Casing drift + 0.06 in. (1.5 mm)			Casing drift + 0.04 in. (1 mm)		
Tool length	3.02 ft (0.92 m)		3.25 ft (0.99 m)		3.25 ft (0.99 m)	
Fish neck length	9.882 in. (251.0 mm)		10.184 in. (258.7 mm)		9.882 in. (251.0 mm)	
Cutting structure	PDC, TSP, HVOF					
Face cutter size	0.51 in. (13 mm)					
Face cutter quantity	15		24		15	
Gauge cutter size	0.51 in. (13 mm)					
Gauge cutter quantity	10		6		10	
Stabilizer gauge length	7.365 in. (187.1 mm)		7.271 in. (184.7 mm)		4.857 in. (123.4 mm)	
Gauge protection	Serrate carbide insert					
Nozzle quantity	5		9		5	
Maximum total flow area using ceramic nozzles	1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )		2.24 in. <sup>2</sup> (14.44 cm <sup>2</sup> )		1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )	
Maximum total flow area using copper nozzles	2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )		4.67 in. <sup>2</sup> (30.12 cm <sup>2</sup> )		2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )	
Optional valve	None			Cemented single SS3 valve		
Backpressure rating	N/A			5,000 psi (34 MPa)		
Junk slot area	23.77 in. <sup>2</sup> (153.33 cm <sup>2</sup> )		37.98 in. <sup>2</sup> (245.03 cm <sup>2</sup> )		19.99 in. <sup>2</sup> (128.94 cm <sup>2</sup> )	
Tool burst rating	8,830 psi (61 MPa)		8,830 psi (61 MPa)		14,770 psi (102 MPa)	
Tool collapse rating	6,240 psi (43 MPa)		6,240 psi (43 MPa)		13,350 psi (92 MPa)	
Tool tensile rating	2,808 kip (12,491 kN)		2,808 kip (12,491 kN)		2,360 kip (11,699 kN)	
Equivalent casing grade	P110					
Nose material	Aluminum alloy					



# CleanReam™ Premium Casing-Reaming Bit

## Specifications (continued)

Blank accessory part numbers	02394732	02399289		02231767	02392320
Nominal tool size	9-5/8 x 10-5/8 in.	13-3/8 x 14-1/2 in.	13-5/8 x 14-1/2 in.	7 x 8-1/4 in.	5-1/2 x 6-1/4 in.
Number of blades	5	5		5	4
Drilling diameter	10.625 in. (269.88 mm)	14.500 in. (368.30 mm)		8.250 in. (209.55 mm)	6.250 in. (158.75 mm)
Casing size	9.625 in. (244.48 mm)	13.375 in. (339.73 mm)	13.625 in. (346.08 mm)	7.000 in. (177.80 mm)	5.500 in. (139.70 mm)
Connection	As requested				
Casing weight range	44 to 54 lb/ft (65 to 80 kg/m)	61 to 72 lb/ft (91 to 107 kg/m)	88.2 lb/ft (131.2 kg/m)	26 to 32 lb/ft (39 to 48 kg/m)	20 to 23 lb/ft (30 to 34 kg/m)
Casing ID and drift	To API 5CT				
Blank connection ID	Casing drift + 0.04 in. (1 mm)	Casing drift + 0.06 in. (1.5 mm)		Casing drift + 0.04 in. (1 mm)	Casing drift + 0.04 in. (1 mm)
Tool length	3.49 ft (1.065 m)	3.74 ft (1.140 m)		3.05 ft (0.930 m)	2.07 ft (0.630 m)
Fish neck length	11.966 in. (303.9 mm)	12.000 in. (304.8 mm)		10.049 in. (255.2 mm)	7.937 in. (201.6 mm)
Cutting structure	PDC, TSP, HVOF				
Face cutter size	0.35 in. (9 mm)				
Face cutter quantity	15	15		15	8
Gauge cutter size	0.35 in. (9 mm)				
Gauge cutter quantity	10	10		10	8
Stabilizer gauge length	6.841 in. (173.7 mm)	6.937 in. (176.2 mm)		4.597 in. (116.8 mm)	5.533 in. (140.5 mm)
Gauge protection	Serrate carbide insert				
Nozzle quantity	5	5		5	4
Maximum total flow area using ceramic nozzles	1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )	1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )		1.24 in. <sup>2</sup> (8.02 cm <sup>2</sup> )	0.99 in. <sup>2</sup> (6.41 cm <sup>2</sup> )
Maximum total flow area using copper nozzles	2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )	2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )		2.59 in. <sup>2</sup> (16.73 cm <sup>2</sup> )	2.07 in. <sup>2</sup> (13.38 cm <sup>2</sup> )
Optional valve	Cemented single SS3 valve	Cemented single SS3 valve		Cemented single SS3 valve	No valve
Backpressure rating	5,000 psi (34 MPa)	3,000 psi (21 MPa)		5,000 psi (34 MPa)	N/A
Junk slot area	8.73 in. <sup>2</sup> (56.30 cm <sup>2</sup> )	10.43 in. <sup>2</sup> (67.30 cm <sup>2</sup> )		6.43 in. <sup>2</sup> (41.48 cm <sup>2</sup> )	3.90 in. <sup>2</sup> (25.18 cm <sup>2</sup> )
Tool burst rating	10,900 psi (75 MPa)	8,830 psi (61 MPa)		14,850 psi (102 MPa)	23,750 psi (164 MPa)
Tool collapse rating	7,950 psi (55 MPa)	4,570 psi (32 MPa)		15,110 psi (104 MPa)	19,530 psi (135 MPa)
Tool tensile rating	1,710 kip (7,606 kN)	2,808 kip (12,491 kN)		1,205 kip (5,360 kN)	1,000 kip (4,448 kN)
Equivalent casing grade	P110				
Nose material	Aluminum alloy				

