

Copperhead Mill

Single-trip plug-removal device

APPLICATIONS

- Removal of Copperhead* drillable bridge and frac plugs from vertical, deviated, and horizontal wells

BENEFITS

- Elimination of multiple millout trips saves time and reduces costs.
- Small, consistently sized cuttings minimize plug removal time.

FEATURES

- Reduced weight on bit and wear on mill
- Consistent millout times
- Serrated and flat blade combination for constant milling rate
- Large bypass and flow-through features to facilitate cuttings removal
- Tungsten carbide buttons on outer surface for gauge maintenance

The Copperhead mill can remove all Copperhead plugs in a single trip downhole. The tool is designed to simulate the action of a machine shop lathe. A serrated blade cuts grooves in the aluminum and a flat blade follows it, flattening the peaks. This process occurs three times per rotation. The mill cuts into the metal instead of crushing it, producing small, consistently sized, lightweight cuttings that can be circulated out of the well, keeping the mill face clean. The mill's bypass and flow-through features also facilitate cuttings removal.

The design of the mill minimizes the required weight on bit (WOB), improving millout time in long, horizontal sections where friction limits the weight that can be transmitted to the bit. Tungsten carbide buttons on the outer surface keep the mill OD in gauge during the milling of multiple plugs, preventing coring of the plugs, and also protect the casing from damage.



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Copperhead Mill Sizes

Casing Size, in [mm]	Casing Weight, lbm/ft [kg/m]	Mill OD, in [mm]
2.875 [73]	6.5 [9.67]	2.25 [57.15]
	7.8–8.7 [11.76–12.95]	2.125 [53.98]
3.5 [88.9]	9.3–10.3 [13.84–15.33]	2.72 [69.09]
	12.95 [19.27]	2.562 [65.08]
4.5 [114.3]	11.6–15.1 [17.26–22.47]	3.625 [92.08]
	15.1–17 [22.47–25.33]	3.5 [88.90]
	21.6 [32.14]	3.25 [82.55]
5 [127]	18–21.4 [26.78–31.84]	3.875 [98.43]
	23.2–24.2 [34.52–36.01]	3.75 [95.25]
5.5 [139.7]	15.5–17 [23.07–25.30]	4.625 [117.48]
	20–23 [29.76–34.23]	4.415 [112.14]
7 [177.8]	20–26 [29.76–38.69]	6 [152.4]
	26–35 [38.69–52.08]	5.75 [146.05]