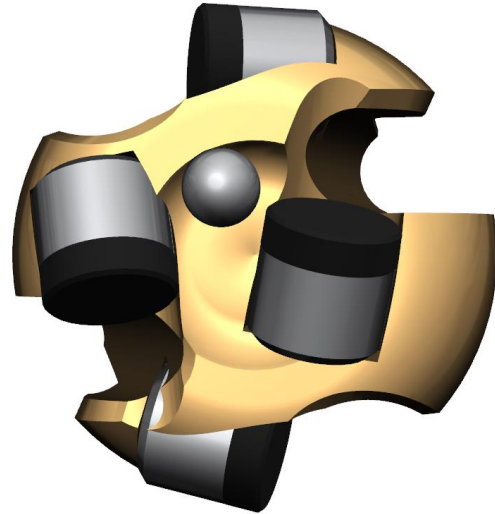


PDC Micro-Bit for 2019 SPE Drillbotics Competition

For the 2019 Drillbotics directional drilling challenge, a generic directional PDC micro-bit has been designed. Several changes have been implemented to aid directional drilling. The length has been significantly reduced and the bit anisotropy increased. Additionally, provisions are made to let participants adjust the axial and side aggressiveness of the bit before a run by changing the exposure of the blunt tungsten carbide elements on the gage pads and on the bit face.



PDC Micro-Bit



Micro-Bit face view

Specifications:

Overview	Steel body bit with 4 PDC cutters
Bit Diameter	1.25"
Bit Length	1.25"
Cutter Diameter	0.323"
Chamfer	0.010" x 45° (No ground flats)
Back Rake Angle	Cone Cutters (1-2): 25° Shoulder Cutters (3-4): 20°
Clearance at Gage Pads	Configurable* 0" - 0.150"
Depth-of-cut Control	Configurable** (No bit body rubbing)
Hydraulics	Two ports (Not shown in the image)
Connection	1/4" NPT Threads (Not to be modified)

*Four tungsten carbide ovoid elements will be provided to adjust the gage configuration. The elements can be installed at a designed exposure using brazing or a special adhesive to adjust the clearance at the gage between 0" and 0.150"

**A tungsten carbide ovoid element will be provided to adjust the depth-of-cut control configuration. The element can be installed on the bit face at a designed exposure using brazing or a special adhesive.