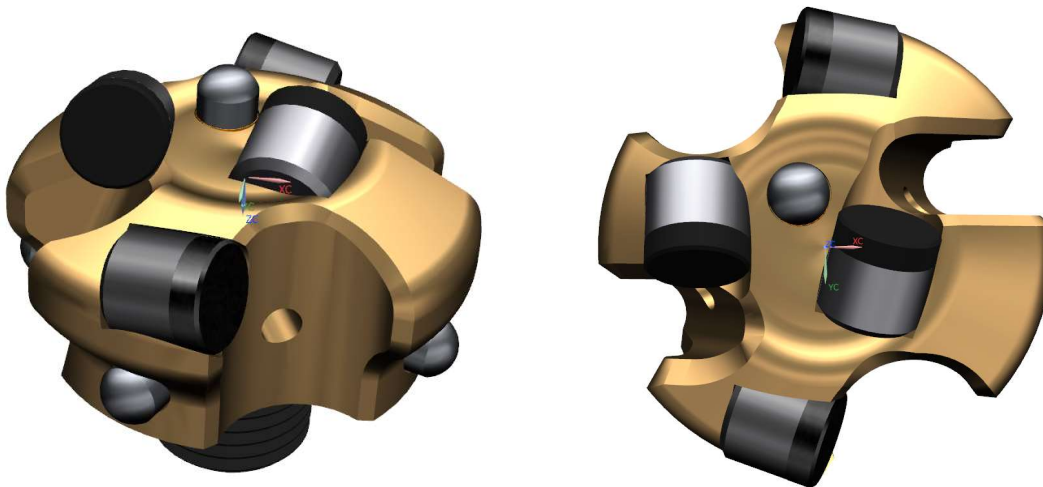


PDC Micro-Bit for the 2020 SPE Drillbotics Competition

For the 2020 Drillbotics directional drilling challenge, a generic directional PDC micro-bit has been designed. The changes from last year's design include increase of bit diameter from 1.25" to 1.5" and additional of fluid ports to a total of four. The bit features short bit length and high bit anisotropy. Most importantly, the bit has provision 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.



Bit Specifications

Overview	Steel body bit with 4 PDC cutters
Bit Diameter	1.5"
Bit Length	1.35"
Cutter Diameter	0.323"
Chamfer	0.010" x 45 ⁰ (No ground flats)
Back Rake Angle	Cone Cutters (1-2): 25 ⁰ Shoulder Cutters (3-4): 20 ⁰
Clearance at Gage Pads	Configurable* 0"- 0.150"
Depth-of-cut Control	Configurable** (No bit body rubbing)
Hydraulics	Four ports 0.125" Diameter each
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.