Using dimensionally accurate solid models of the tools within the casing in Solidworks, a solid model of the annular area is created. (see in dark red below). Using the Solidworks measurement tool, the available annular area is measurable with a high degree of accuracy. The highlighted data above is determined using this method. The 7 x 3 ½ ATA in 7” 23# Casing is shown below as an example of the modelling. This is adaptable to any tool, and any casing, in any casing weight. The screen shots below are directly from Solidworks and display the annular area between the tool geometry and the casing ID.