

Fig. 1

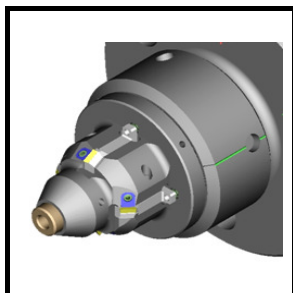


Fig. 2



Fig. 3

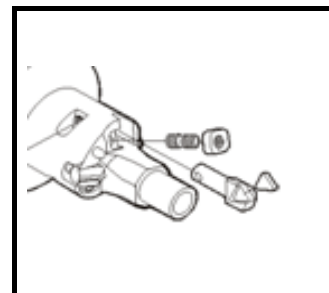


Fig. 4

Anyone who has ever attended a CBN seminar has heard the presenter tell the attendees that CBN works best when it is held rigidly. Even though many examples are given we sometimes forget how important that fact is.

One of the best examples happened to Master Tool a few years ago. An automotive company in Detroit installed a new transfer line machining aluminum cylinder heads (See Fig. 1). The critical feature on a cylinder head is the machining of the valve seat angles in the powdered metal exhaust and intake seats. The machine tool investment for the transfer line was \$38 million.

The Machine Tool Builder and the end user decided to purchase finish valve seat tools from our competitor. There was a guaranteed tool life made of 2000 holes per tool by the cutting tool manufacturer. After a year of trying and testing the highest tool life that they were able to achieve was only 600 holes. With 12 exhaust and 12 intake seats in each cylinder head **the cutting tool cost per head was \$1.92 each** (one of the highest costs in the industry).

The end user contacted Master Tool to see if we had any better options. The competitor's tool used a TPEE-632 Full Top CBN insert held in a conventional cartridge (see Fig. 2). While discussing the situation with the end user he showed us a letter written by upper management from his existing cutting tool vendor. This letter stated that because of the "unique properties" of his powdered metal seat material the best tool life that he could hope for was the 600 holes he was currently getting.

The Master Tool design uses the same TPEE-632 insert in our finish valve seat tool as does our competitor. However, there are dramatic differences in the design of the tools. Our competitor uses a conventional cartridge with a top clamp to hold the CBN insert. Master Tool uses a patented round shank cartridge that is totally enclosed in the tool body for rigidity (See Fig 3). Master Tool also uses a carbide wedge to wedge both the insert and the cartridge into the tool body (See Fig. 4).

The end user placed a test order with Master Tool for a set of tools. When the tools were completed and ready to be installed, the Sumitomo CBN inserts that were shipped got lost at the customer's facility. In order to get the tools tested we used the competitor's inserts in our pockets. The initial result was 2500 holes with the competitor's CBN insert (the same insert that the competitor told the customer that the best tool life he would achieve was 600 holes).

When we finally tested the Sumitomo CBN and edge preparation the tool life increased to 3500 holes per edge. **The final result was a cost per hole of \$0.014 and a cost per part of \$0.33. That is a cost savings of \$1.59 per part. Based on 350,000 parts per year the annual cost savings was \$556,500.00 per year.** The return on investment for the new tools was less than 2 months.

**For more information call or e-mail Master Tool or your local distributor:**

