



Single Crystal Synthetic Diamond:

Single Crystal Synthetic Tools **(Sumitomo & Mono Die)**

The Sumitomo and Mono Die Crystals were originally manufactured as a diamond heat sink material. However it was realised that due to the purity of the crystal and its increased nitrogen content, that it would be ideal for single crystal cutting tools.



Around 1986 Contour received it's first samples of this material. A series of sample tools were manufactured and evaluated by selected Contour customers. The manufacture of these tools proved to be difficult and we were disappointed at the inconsistency of the crystal. For this reason only a percentage of the tools manufactured could be supplied for evaluation. However, the feedback from these tools was very encouraging. Following two years of dialogue between the Contour and the manufacturers they began to supply a consistent crystal suitable for Contour's demanding requirement for cutting tool manufacture.

Contour; have implemented a rigorous incoming inspection system on the crystals. The orientation alignment, amongst other factors, is critical to tool performance. The result of this is that we are able to offer high quality cutting tools made from this material to a consistent standard. This being the same standard to which we make natural diamond tools.

We have found that this material does perform better than natural diamond, when used to cut materials, which are prone to chemically wear diamond. In particular it does perform very well when cutting RGP materials.

When used, initially, the surface finish (on the work piece) does deteriorate at a similar rate as natural diamond. It will then hold this finish over a long period of time. Then, the tool will deteriorate quickly to a poor finish, at which time you will be aware it is time for a tool change. This is a different wear characteristic to natural diamond tools which show signs of a continuing wear rate through their life.