

An efficient optimization process to improve PM machinability

Achieving better machinability is a crucial factor in making PM steels more competitive against conventional steels. The PoP Centre offers new services to help customers and end-users analyze and enhance machining performance.

“The PoP Centre’s resources give us new possibilities to investigate the factors that affect machining and find ways to improve machinability for specific applications,” says Olof Andersson, who is responsible for the Centre’s machinability services. “Many PM parts need secondary machining operations, mostly in our customers’ PM production processes, but also on end-users’ finishing machines and assembly lines, and we are aware that some customers consider this a difficult challenge. However, we can now offer a combination of existing expertise and new machinability testing services to help meet this challenge and support customers and end-users in process improvements.”

A range of state-of-the-art testing and machining capabilities are available at the Centre, including a new CNC turning lathe and a 5-axis CNC vertical machining centre, which can perform turning, drilling or milling tests to provide data on key machining parameters.



With relevant data from the customer we can examine all the parameters of the existing machining operation, as the Centre’s capabilities give us the possibility to simulate customers’ machining conditions. If appropriate, we can then start an optimization process in cooperation with the customer that will lead to the best possible machining results for a given application.”

In many cases the machinability of sintered PM steels can be improved by optimizing different parameters such as material properties, tool material, machining enhancing additives or oil impregnation.



The optimization process can draw on a comprehensive range of services: machinability testing, material selection and tailoring of powder solutions, optimization of machining conditions and the evaluation of machining enhancers.

By offering access to the latest innovations in PM machining enhancing additives, the Centre increases options for finding the most suitable solution. Höganäs already supplies two well-established products, MnS and MnX, and has recently launched a new enhancer called SM3. Another new additive, designed to further enhance the machinability of hard microstructures, is currently being developed and tested prior to an expected market introduction in mid-2010.

“We are looking for solutions that offer as good or better performance as MnS, but require a reduced percentage of additive, which can be important when aiming for higher densities,” Olof explains. “The results so far have been very promising. We intend to extend our portfolio of machining enhancing additives to provide tailored solutions for a wider range of PM materials.”

There are many benefits to be gained from enhancing PM machinability, states Olof: “A solution that brings together the optimum machining conditions, material and cutting parameters can increase productivity, reduce machining costs and prolong tool life”

Höganäs has already used the PoP Centre facilities extensively to evaluate best practice and improve the performance of its press ready mixes in combination with existing and new additives. These results can be made available to create better manufacturing solutions for parts producers through cooperation with Höganäs Technical Support worldwide.



“We are now in a better position than ever to act as a partner for improving PM machining, and this will help customers and end-users to develop more cost-effective machining solutions that can in many cases outperform wrought steels and thus improve the overall competitiveness of PM solutions,” concludes Olof.

