

SORB TECH – the steel of tomorrow?

Increasing demands on the processing quality and performance of woodworking machinery coupled with calls for ever more sparing use of resources have prompted the development of a new material for machine construction.

It was in the on-going search for woodworking machine designs with improved processing results coupled with higher output (reduced unit costs) that the HOMAG Group began five years ago to consider the possibility of finding an alternative construction material for use in its basic machines. The most obvious way forward was to develop a machine frame made of a mineral material of the type already used in metalworking machining centres since the beginning of the nineties. The benefits do not need lengthy explanation: this type of construction is capable of withstanding increased demands on machine dynamics and precision and – making joint use of direct drives and HSC milling technology – they provide a low-vibration, stable machine construction promising improved work results and maximum precision.

Machine frames made of mineral casting also offer enormous benefits in the woodworking sector: They guarantee an extremely high standard of surface quality – a factor of paramount importance in the woodworking industry. They also create ideal conditions for substantially improved tool service life, while the increased weight allows high feed rates and acceleration levels (dynamics) – adding up to substantial savings in terms of both time and money.

The machine frame forms the “supporting platform” for assemblies such as the drive axes, clamping tables, sawing carriage etc. This foundation is

frequently the heaviest component of the machine, which is generally “resting” and is required to absorb the high forces generated by the various processing operations.

Using existing findings in the field of mineral material technology and the latest developments in the field of hydraulically bonded ultra high-performance mineral materials, the HOMAG Group launched a development project. Working in conjunction with research institutes, a new type of material was “designed”. Its main attributes include high damping characteristics (fewer vibrations which can show up in the form of “chatter marks” on workpiece surfaces). The design of the new material took into account the many different designs used for components of CNC machines, saws, throughfeed machines or sanding machines. Also in terms of energy and resource efficiency, marked improvements have been achieved compared to steel, without losing sight of the cost benefits in comparison to welded steel constructions.

In certain areas, the development engineers were able to draw upon many years of experience accumulated by the Group member companies HOLZMA (pressure beam saws), WEEKE (processing centres) and HOMAG (processing centres).

The culmination of the joint project is SORB TECH[®] – a fibre-reinforced mineral mix. Following exhaustive testing on different machine frames – such as over 4 million load cycles to simulate continuous loads (**Fig. 1**) throughout a complete “machine life” – the results are certainly impressive.

- A basic machine made of SORB TECH[®] has a higher weight coupled with excellent damping characteristics. This permits higher acceleration and consequently increased productivity
- SORB TECH[®] ensures maximum stability and absorbs almost all vibrations even for the most complex processing operations, ensuring optimum surface quality and longer tool life
- SORB TECH[®] reduces primary energy consumption, in particular compared to welded steel constructs, and also demonstrates greater energy efficiency
- A unique selling proposition of HOMAG Group AG (various patents for the use of the fibre-reinforced mineral mix in mechanical engineering applications have been applied for)

The first products were launched at the LIGNA 2009 in Hanover – and met with resounding success. Machines showcased included the new BÜTFERING sanding machine series SWT 900 based on SORB TECH[®], HOMAG and WEEKE presented a joint development in the form of new processing centre series BMG 400 and BMG 500, and HOLZMA was present with series 5 pressure beam saw using the new technology which opens up a whole new dimension in performance.

Summary

This successful joint material development by the HOMAG Group offers enormous potential for the future, with plans already under way for additional product groups using SORB TECH[®] to enhance customer benefit without increasing costs.



Fig. 1:
Displacement measurements on the component cross-section under load



Fig. 2:
SORB TECH[®] with design elements



Fig. 3:
BMG processing centre from HOMAG/WEEKE made from SORB
TECH[®]



Fig. 4:
SWT 900 wide-belt sanding machine made from SORB TECH[®]

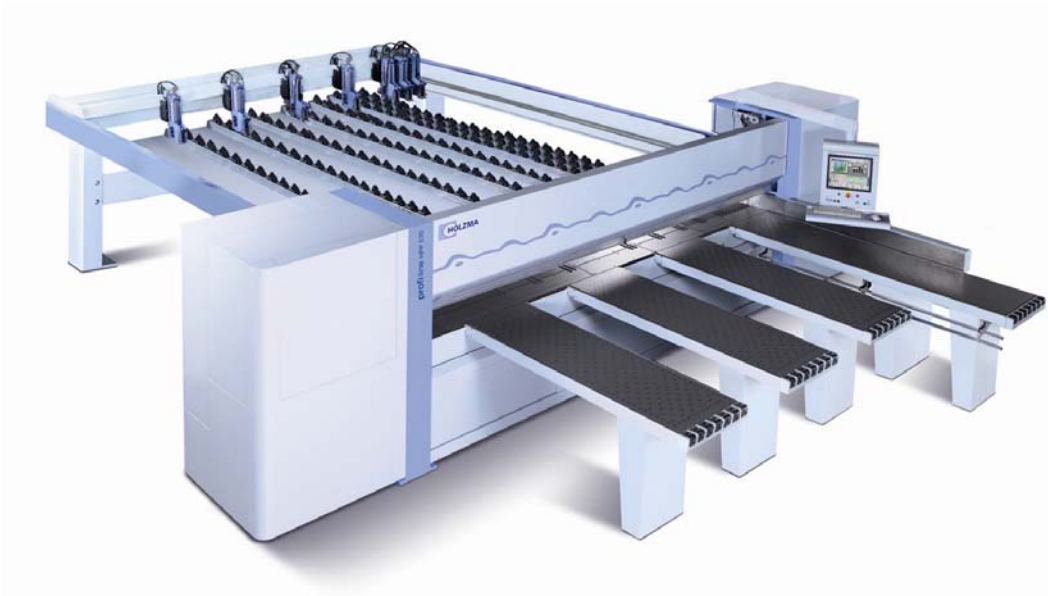


Fig. 5:
Pressure beam saw HPP 500 made from SORB TECH®

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