Cleaning and finishing cylinder heads efficiently requires smart solutions.

Reliable partner
To be successful in business you need reliable partners. Austria-based Fill GmbH has worked hard to be a reliable partner, providing one-off solutions to its customer VAW mandl&berger for many years. So it was no surprise when Fill, a company that provides system solutions for metal machining, was asked by VAW mandl&berger to supply it with a cylinder head processing plant.

The challenge was to provide highly technical and functional quality in a restricted space. At its company headquarters in Linz, Germany, VAW mandl&berger produces a million cylinder heads annually for the motor industry. Customers include some of the biggest names in the industry, including BMW, Ford, General Motors, Isuzu, Opel, Rover and Volkswagen. VAW mandl&berger and Fill have worked together in a number of areas, including the design of the cylinder head or crankcase, the construction of tools such as core-casting moulds and ladies and the production of the castings (including the handling of the raw materials).

The M47 cylinder head made by VAW is used in the BMW 318D and the BMW 320D/520D automobiles. The cylinder heads for both engines are fundamentally the same, differing only in the alloy that is used. In addition, the M47 R is used in the Rover 75 2.0 CDT. VAW mandl&berger delivers the cylinder heads after the initial production phase to BMW Steyr, where the cylinder heads go through cleaning and finishing and are then fitted into the engines.
The assembly production cell for BMW M47 cylinder heads was planned and put into operation in the shortest possible time by a project team that was formed for the job in the foundry’s technical school at VAW.

A gantry robot lifts each cylinder head from the conveyer belt and takes it to the station where the sand core is broken up by a hammer. At this point, an IRB 6400 robot picks up the cylinder head and places it in Fill’s Swingmaster decoring system. There the core is reduced by the swinging movement. The cylinder head is emptied as the Swingmaster moves.

From there, the IRB 6400 takes the cylinder head to a circular saw where the rough edges are removed. Next, the pieces are assembled and undergo a cleaning and finishing process. The gate is removed, and the camshaft and the gearbox sides of the cylinder head are milled and deburred. The work is done to a tolerance of +/- 0.5 mm. Before it’s taken away, individual slots in the camshaft are punched out. After a visual check, the cylinder head is guided back into the plant and automatically packed into the right box for transportation.

The production area is soundproofed for noise and security protection. The shavings that are produced in the processing of the cylinder heads are separated by alloy type and then recycled. The cylinder heads are produced at a rate of one every 60 seconds over three shifts a day in this newly designed processing plant.