Dörrenberg is located in the heart of the German steel region, Engelskirchen. “This was the cradle of German steel because of the availability of iron ore, coal and water,” Thomas explains. “Many steel factories are in a circle of twenty kilometres from us, although several large ones relocated to the Ruhr area, following the coal. Our specialty is the production of special steels, we develop them ourselves and afterwards we harden them. After tool production they come back to us for coating. Some automotive brands even define our special steel in their specifications.

The automotive trend of weight reduction is actually in our favour, because these new materials are responsible for more wear on tools, which means they need to be coated. Our experience in this business gives us a broad know how of the connection between the steel and the coating layers.”

Firemen Instructions
Thomas grins. “Sometimes the steel used in cars is so thin and hard that instructions are printed on the car about the exact location where firemen can cut the roof open. Well, hard steels need coated tools with specific characteristics. Our business area Coating & Hardening is a bit special within Dörrenberg, because it is the only service company. In this business unit we employ seventy people and realise thirteen million euro turnover.”

Nitriding and PVD in One Process
“A Huge Step Forward in Time and Quality”

Founded one hundred and fifty years ago
and still at the forefront of steel business;
Dörrenberg Edelstahl in Germany is a company
to admire. “With a keen eye on technological
development, we choose the ones that give
our customers value for money,” Thomas
Passberger, division manager Coating &
Hardening at Dörrenberg, says.

Hauzer Flexicoat® 1200 for hybrid technology

“Nitriding and PVD, first four days production, now overnight”
We are specialised in treatment of all kinds of punching and forming tools, large and small, from a few grams to twenty tonnes a piece. Every year we treat more than one million tools. Our services comprise every link of the chain. Hardening, nitriding, hard material coating, assembly, disassembly, pre-treatment and post-treatment; we do it all.”

**Overnight**

“Since about seven years we offer the service of nitriding together with physical vapour deposition (PVD) for tools that cannot be treated with chemical vapour deposition (CVD),” Thomas says. “Sometimes even minimal changes in dimensions are causing problems, as seen in cold forming, hydroforming or aluminium forming. The hybrid technology, combining these two technologies in one batch, is a good alternative. Nitriding ensures a good support for the hard coating and together it results in a much higher load bearing capacity. Conventionally, the treatment took three to four days with in between a polishing step. Last year we decided to improve on this process. The result has been beyond expectations, it is really a huge step forwards for us in time and quality. With our Hauzer Flexicoat® 1200 we now offer this hybrid technology, so we can produce overnight and with a much better result. We offer the technology with the coatings aluminium titanium nitride, aluminium chrome nitride, chrome nitride and titanium chrome nitride. Our reason to buy the Hauzer machine were threefold. We wanted more capacity, we wanted to coat larger tools and we saw the immense advantages of the new technology.”

**3D Printed Sand**

Dörrenberg’s keen eye on technogical development does not stop at steel, hardening and coating. Thomas shows some pictures of the newest 3D printing machine at Dörrenberg. “This machine uses sand with a binding material to print a mould for our steel foundry,” he explains. “After printing, the remaining loose sand will be shaken off and we pour the steel. Thus we produce steel moulds with very complex and precise geometries. When the steel mould is ready, all sand is removed and can be reused in the next print. The base will be finished and the work surfaces will be hardened with induction. They sometimes say that 3D printing will change the ways of manufacturing, well I completely agree. There are still a lot of challenges to make sure we will never be bored.”