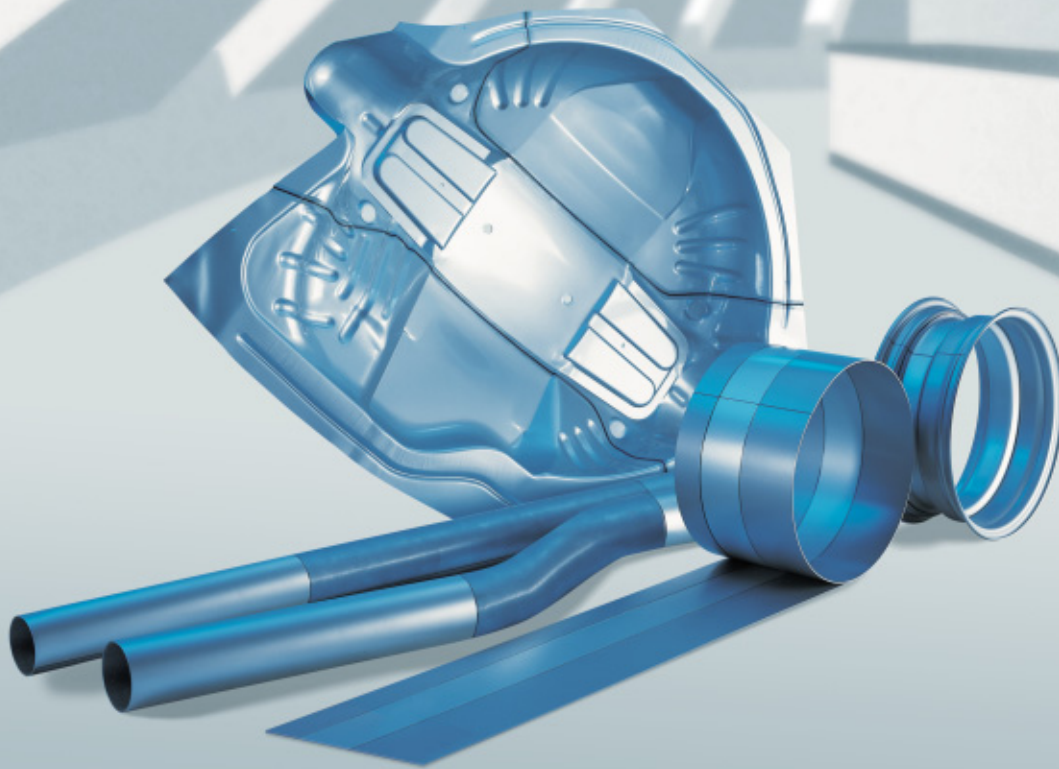


ThyssenKrupp Tailored Blanks – Product range.



A company
of ThyssenKrupp
Steel

ThyssenKrupp Tailored Blanks



ThyssenKrupp

Product overview.

ThyssenKrupp Tailored Blanks

In laser beam welding, sheet metal parts are butt-welded together. Different kinds of equipment are available to manufacture a wide variety of blanks.

The laser weld displays the following properties:

- Low weld volume, i.e. weld widths of approximately 1 mm
- Low weld convexity
- Forming properties practically unaffected by the weld
- Maintenance of cathodic protection effect
- Lower thermal stress on base materials during welding

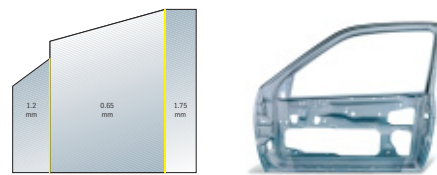
Tailored blanks can be produced with linear or nonlinear welds. The use of nonlinear welds makes it possible to meet varying and in part contradicting demands on vehicle components.

Dimensions

Sheet thicknesses: 0.60–3.00 mm

Weld length: max. 2,800 mm

Steel grade: according to ThyssenKrupp Steel product range



Door inner with schematic of laser welded blank.



Individual parts of an engineered blank before and after welding.

ThyssenKrupp Tailored Blanks for hot stamping

Faced by calls to increase passenger safety and reduce vehicle weight, the auto industry needs new solutions. More and more car manufacturers are turning to hot stamping of body parts. In this process, a sheet of 22MnB5 steel is heated to approximately 950°C in a furnace and subsequently cooled in a stamping die at 30 K/s. As a rule, the part reaches strengths of 1500 MPA. Such strength levels cannot be achieved with the steels available today using conventional deep drawing.

ThyssenKrupp Tailored Blanks carried out various studies into this topic. Initial vehicles using this technology have been in production since 2007. ThyssenKrupp Steel supplies 22MnB5 with or without AlSi coating.

Advantages

- Ability to combine various sheet thicknesses and steel grades, as before. This means customers benefit from the classic advantages of tailored blanks for this production route as well.
- Ability to weld manganese-boron steel to softer steel grades, for example to produce B-pillars with very high strength levels which also display adequate residual elongation at crash-relevant points.



Tailored Products.



- » Complex customer requirements call for tailored steel solutions – especially to meet the constantly growing demands of the automobile industry.

ThyssenKrupp has been producing tailored welded blanks since 1985. They are used to meet modern design requirements in vehicle components. Tailored blanks are tailored exactly to individual customer requirements. In simple cases this can mean joining two sheets to achieve a wider product than can be produced by rolling. In more complex cases, several individual sheets of different grade, gauge and coating are joined by laser beam welding for use in products that have to meet extremely high safety requirements, for example car doors, floor and side panels, side beams and wheel arches.

Since 2007 more and more car manufacturers have been using tailored blanks for the hot stamping of body parts. This process provides for very high strength levels while allowing various combinations of gauge and grade.

ThyssenKrupp Tailored Tubes are used in lightweight, cost-efficient, resource-saving steel spaceframes.

The success of our tailored products is based on increased customer value, achieved through weight reduction, increased stiffness, reduced parts counts, component optimization and lower costs.

The latest additions to the range – ThyssenKrupp Tailored Strips – open up even more applications, both in the automotive industry and in profile production.

To find out what else you can expect from our innovative tailored products, read the following pages.

Product overview.

ThyssenKrupp Tailored Tubes

ThyssenKrupp Tailored Tubes are hollow profiles which are made of different steel grades and can have different wall thicknesses, strengths and coatings. In the NSB® NewSteelBody, ThyssenKrupp Tailored Tubes were processed into components by means of hydroforming. In the meantime engineers at ThyssenKrupp Steel have succeeded in developing a new process for making near-net-shape parts even more economically. This innovative production technology can be used to produce near-net-shape profiles with varying cross sections and secondary design elements.

The following geometry options are currently available:

- Cylindrical tubes with thickness changes transverse to longitudinal axis
- Conical tubes
- Closed profiles with secondary elements
- Variable geometries



Closed profile with integral secondary element.

ThyssenKrupp Tailored Strips

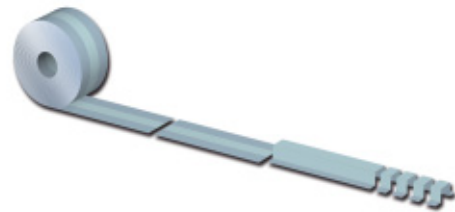
To make tailored strips, two/three strips of different steel grade and/or thickness/coating are joined together lengthwise by means of laser beam welding. The material is then wound into a coil to be used as a starting product for a customer process. The innovative aspect is the continuous welding of coils.

Various applications in the auto and profiling sectors

- Profiles for switchgear cabinets, furniture etc.
- Seat rails and backrests in the auto sector
- Exhaust systems
- Rims for car wheels
- Rockers

Advantages in customer process

- Lightweight construction
(material thicknesses can be selected to suit application)
- Reduction in number of process steps
(elimination of reinforcements)
- Improved corrosion properties
(use of different coatings or materials at different points of the component)



A laser-welded strip made up of three different steels each with specific physical properties can be formed directly from the coil.

ThyssenKrupp Patchwork Blanks®

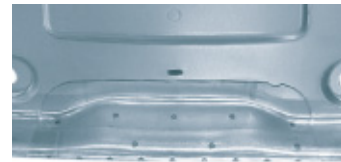
For local reinforcement of specific zones, ThyssenKrupp Patchwork Blanks® offer the best solution. Reinforcements are welded onto a carrier blank by spot welding or remote laser welding. Patchwork blanks can be formed in one operation and offer different wall thicknesses to suit local load requirements.

Features of spot welding

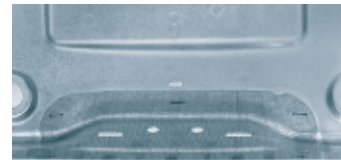
- Sequential spot welding
- Finish welded
- Limited control of forming behavior

Features of remote laser welding

- Fast sequential welding
- Various weld forms and weld directions possible
- Free control of forming behavior and component properties



Spot-welded patchwork blank.



Remote laser-welded patchwork blank.

ThyssenKrupp Tailored Orbitals

Tailored orbitals are innovative starting materials based on the principle of tailored products. The ability to combine different materials, gauges and coatings has created a new generation of parts. The wide permutations possible open up applications in various areas of industry, both in vehicles and in the general capital goods industry.

Possible applications

- Chassis: Dampers, suspension, ...
- Engine: Shafts, valves, tappets, ...
- Transmission: Shafts, wheels, rings, discs
- Exhaust systems: Pipes, pots, reinforcements, ...
- Steering: Joints, guides, gears, ...

Advantages

The advantages of the product lie in weight reduction, improved functions and lower costs. Worthy of particular note are products made possible by the innovative laser welding technology, such as the DampMatic piston rod from ThyssenKrupp Bilstein.



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