

alphas[®] FORMING

alphas[®] forming

A new dimension in
light-weight construction



Catrina Baumgartner, Customer service

alphas[®] forming – reduce your weight and costs while maintaining the highest quality

with alphas[®] forming – a new dimension in the light-weight construction of innovative, high-quality parts and components in commercial vehicles.

The technology

alphas[®] forming is a unique and perfectly matched combination of hot-rolled steel, tool and processing expertise.

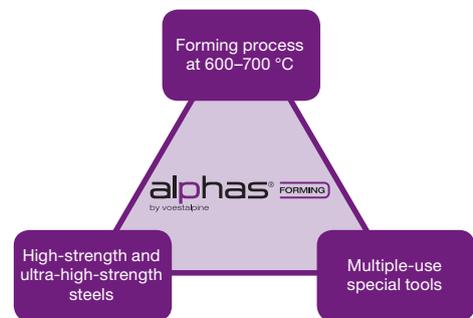
The advantages

- Efficient light-weight construction
- High level of safety
- New design
- Complex shapes
- Functional integration
- Highest quality
- Reduced costs

Applications

alphas[®] forming allows new dimensions in innovative components as compared to conventional forming and joining methods for serial parts such as the following:

- Crossmembers
- Frame-mounted parts
- Consoles
- Underrun guards
- Axle components



voestalpine Steel Division

One of the four worldwide corporate divisions, voestalpine Steel Division in Linz is one of the top three European suppliers of high-quality steel strip and heavy plates for sophisticated applications. voestalpine Anarbeitung – the center of competence for pre-processed hot-rolled products within the Steel Division – offers its customers a unique combination of production and consultancy expertise as a result of its close cooperation with voestalpine Stahl. The combined flexibility of a Steel Service Center and the metallurgical expertise of an integrated steel mill leads to a number of important advantages: A wealth of possibilities are at your disposal to meaningfully accelerate customer processes and achieve higher levels of effectiveness and efficiency.



alphas[®] forming – benefits in detail

Cost reduction and functional integration

The use of special multi-functional tools makes it possible to form highly complex components in a single work step. Manufacturing in a single press stroke without any downstream processing steps shortens the production process and reduces manufacturing costs. One of the advantages of alphas[®] forming is the low number of welding seams, which is another source of effective cost savings.

Safety and light-weight construction

Consistent light-weight construction is currently one of the most important demands in many industries. The application of high-strength and ultra-high-strength hot-rolled strip grades in the alphas[®] forming process can minimize wall thicknesses and thus reduce the component weight without compromising the safety of the component. The required stiffness of the components is guaranteed by the engineering, for example by means of beads or stiffening ribs.

Complex shapes and new designs

alphas[®] forming introduces a new dimension in freedom of design. Temperature-controlled forming makes it possible to achieve complex component geometries that have not been possible until now with conventional forming methods. Narrow radii and variable component cross-sections pave the path to new designs. Integrated weld seam preparation is also possible and saves subsequent work steps. Holes can also be punched and text or logos can be stamped into the component surface.

SHORTBOX

alphas[®] forming reduces

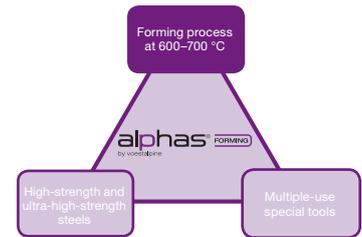
- weight
- number of components
- the weld seams
- assembly and manufacturing times

your costs.

alphas[®] forming increases

- the freedom of design
- the load capacity of your vehicles

**your benefits – and
those of your customers.**



Innovative forming process

For cost reduction and functional integration

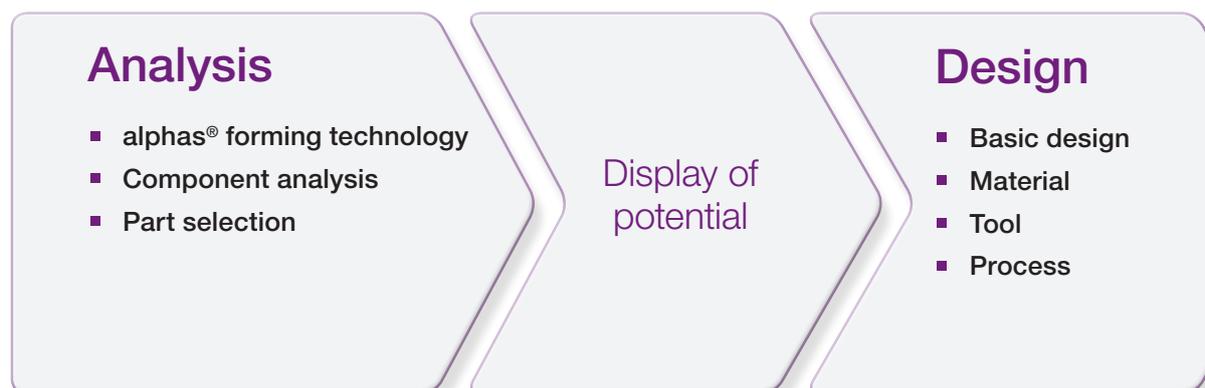
In an initial alphas[®] forming process step, the blanks are heated in a continuous furnace to approximately 600–700 °C, which is below the recrystallization temperature. After exiting the furnace, the tempered blanks are immediately formed.

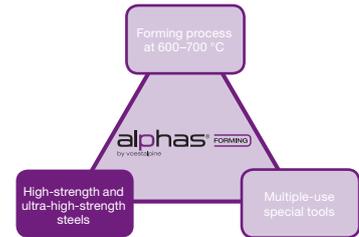
The required alphas[®] forming force is roughly half that required for components at room temperature. The technology has the benefit of being able to form complex components made of high-strength and ultra-high-strength hot-rolled steel grades.

A further advantage of the tempered forming process is that only a minimal layer of scale can form during manufacturing. Because the scale formation is minimized, it is possible to integrate a number of different functions into the tool.

Components and parts manufactured with alphas[®] forming are highly functional with regard to modular design and can be produced with a great degree of precision and consistency with regard to dimensional accuracy, shape and positional tolerance.

The innovation process





High-strength and ultra-high-strength hot-rolled strip

For safety and light-weight construction

alphas[®] forming allows the application of high-strength and ultra-high-strength hot-rolled strip with a yield strength of up to 900 MPa and a strip thickness ranging between 3 and 15 mm. alphas[®] forming can be used to form normalized-rolled and thermomechanically rolled steels, the latter of which is characterized by a homogeneous and very fine microstructure.

The small grain size of thermomechanically rolled steels makes it possible to achieve very high strength and extremely favorable forming properties in the conventional cold forming process. alphas[®] forming utilizes the forming potential of high-strength and ultra-high-strength hot-rolled steel grades at a substantially higher level of effectiveness.

The significantly low amounts of alloying elements in thermomechanically rolled steels allow excellent weldability of these modern materials.

Parts and components manufactured with alphas[®] forming technology meet all the requirements with respect to safety and light-weight construction.

List
of benefits

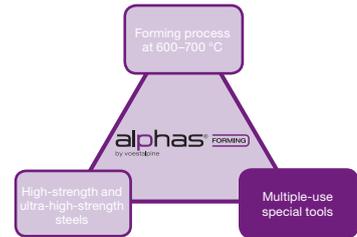
Engineering

- Construction
- Simulation
- Optimization

Offer

Development

- Trials
- Material and welding support
- Sample deliveries
- Tests and feedback



Multiple-use special tools

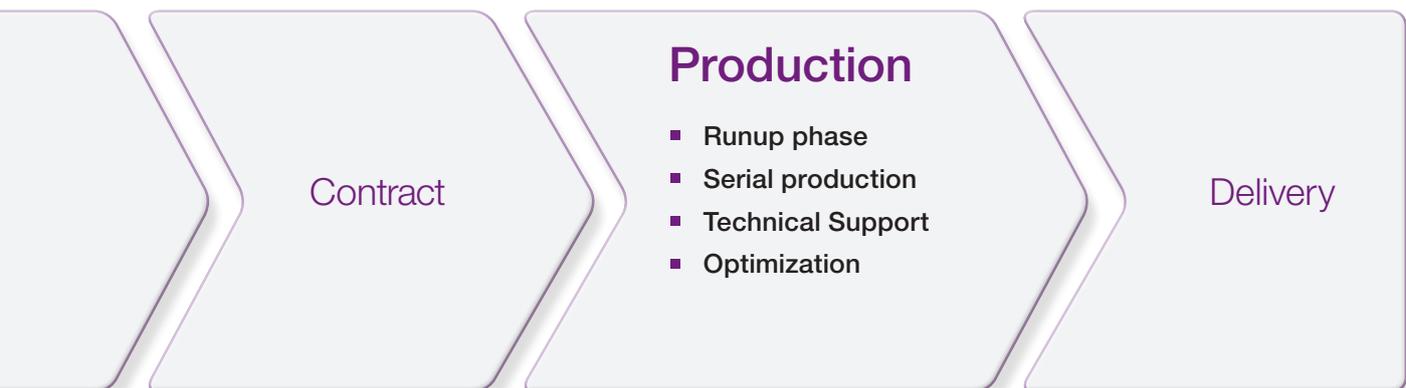
For complex shapes and new designs

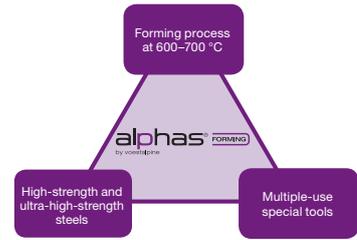
alphas[®] forming utilizes special modularly designed tools in order to achieve the most complex shapes and customer-specific construction designs. These tools offer the possibility of functional integration and are capable of a variety of different functions. At least two work steps can be performed during each press stroke. Depending on the component design, it is possible to integrate a number of additional functions into the special tools.

- **Stamping process** for perfect calibration of the component or surface text stamping
- **Strain softening** for stiff component structures or weld seam preparation
- **Hole punching** for screw or rivet connections and cable ducts

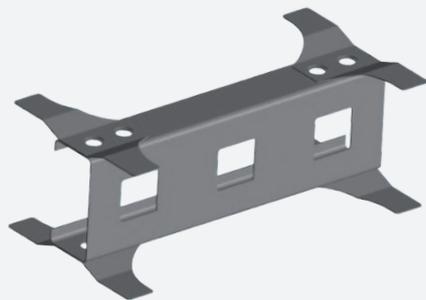
alphas[®] forming has the advantage that several process steps can be combined into a single press stroke, making the manufacturing process short and simple. Subsequent processes such as mechanical processing of the weld seam can be avoided.

Parts and components manufactured with alphas[®] forming technology perfectly meet all the requirements of complex shapes and new designs.



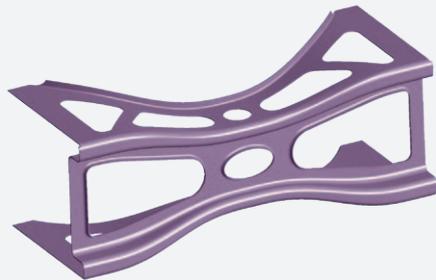


Example: Crossmembers



Conventional crossmembers

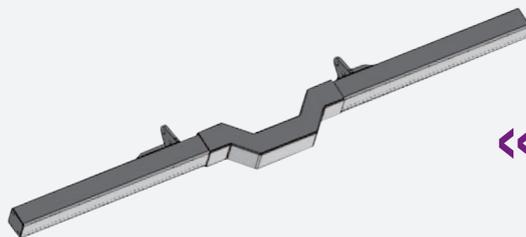
- Weight: 45 kg
- 5 individual parts
- 8 welding positions
- Additional corrosion protection



alphas[®] forming crossmembers

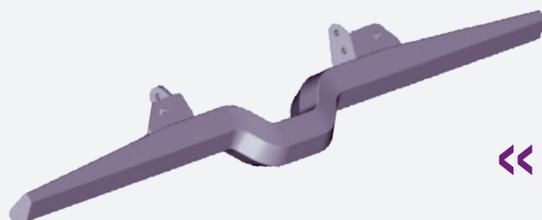
- 25% less weight
- One part
- Without weld seam
- Identical stiffness
- Significantly reduced costs

Example: Underrun guards



Conventional underrun guards

- Weight: 40 kg
- 20 individual parts
- 25 m weld seam length
- Load limit complies with TÜV
- High costs



alphas[®] forming underrun guards

- 20% less weight
- 80% fewer parts
- 80% less weld seam length
- Same degree of safety
- Significantly reduced costs

Technically more advanced. Successful together.

voestalpine Steel Division – the partner you can trust.

High-quality materials are the basis for our products. We strive to be the best partner for our customers and want to provide them with the best-possible solutions. We focus our expertise on two aspects:

The personal aspect, with dedicated and highly competent employees

The technical aspect, with high-quality methods, products and services

The companies in the voestalpine Steel Division and their employees understand partnership to be the following:

- Understanding for their customers' business
- Expertise and reliability
- Responsibility for satisfactory project completion
- Partnerships based on trust

Many years of successful partnerships with our customers prove our point.

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voestalpine

ONE STEP AHEAD.