



## MISSION ACCOMPLISHED. ZINC-COATED STEEL UP TO 2000 MPa

ultralights by voestalpine

Factsheet phs-scalefree® / Status: November 2021

### phs-scalefree® THE FIRST HOT FORMING STEEL UP TO 2000 MPa WITH A THIN ZINC COATING

phs-scalefree 2000 is a special development in the field of lightweight automotive design that opens up new perspectives for the manufacture of high-strength components.

The single-phase zinc-ferrite coating is our secret for success. It ensures excellent scale protection with outstanding hot forming properties and provides additional corrosion protection.

phs-scalefree® is the quality solution for B pillars or internal structural components. Galvanized manganese-boron steels for hot forming are also recommended for large components and are easier to form than uncoated or hot-dip aluminized PHS steels.

#### Mission accomplished.

The new steel solution strengthens the position of voestalpine as the PHS specialist. phs-scalefree® was specifically developed to optimally complement the extensive portfolio of press-hardening steels for hot forming.



Thin zinc coating for high level of processability



PHS process for freedom of design



High-strength components for greater safety



Scale protection for higher cost-savings



Lightweight design for sustainability

EN 10346	VDA 239-100	Special voestalpine grade
-	-	phs-scalefree 2000
-	-	phs-scalefree 1500
-	-	phs-scalefree 490

Premium quality with reduced carbon footprint

phs-scalefree®  
 greentec steel



# UNBEATABLE IN MANUFACTURING AND COMPONENT QUALITY



## Thin zinc coating for high level of processability

- » No special PHS furnace atmosphere required. The zinc layer protects the PHS surface from scaling, and the high emissivity of the zinc-iron surface ensures rapid heating.
- » During coating and throughout corrosion process, the single-phase zinc-iron coating leads to reduced hydrogen absorption when compared to multi-phase zinc-iron coatings and thus protects components from cracking.
- » phs-scalefree® steels have very good adhesive bonding properties because of their special surface.
- » phs-scalefree® can be hot-formed using either the direct and indirect process.



## PHS process for freedom of design

- » In the direct process, variable geometries can be produced due to lower friction in the hot forming tool (when compared to uncoated or hot-dip aluminized PHS steels).
- » Complex geometries, including undercuts, are possible in the indirect process as a result of cold forming in the initial process step.



## High-strength components for greater safety

- » The high-strength components guarantee the best crash performance with the lowest weight.
- » The single-phase zinc-ferrite coating protects the components from corrosion.
- » The experts at voestalpine will provide advice and support from component design to production.



## Scale protection for higher cost-savings

- » The clean and scale-free processes ensure longer tool service life, reduced part cleaning requirements and longer tool cleaning intervals, which leads to savings in the forming process.
- » The reduction of tool deposits and low tool wear also ensure consistently high component quality.



## Lightweight design for sustainability

- » High strengths up to 2000 MPa ensure lower wall thicknesses, lighter vehicle weights for lower fuel consumption and reduced carbon emissions.
- » The press hardening technology also enables larger components. Material usage as well as the number of parts and joints can be reduced.

## Carbon footprint, greentec steel product

greentec steel product	Max. carbon footprint [kg CO <sub>2</sub> , Co <sub>2</sub> e per kg of steel] <sup>1)</sup>
Hot-dip galvanized steel strip	2,3

<sup>1)</sup> The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

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