

## ZINC-COATED STEEL UP TO 2000 MPa

ultralights by voestalpine

phs-scalefree® fact sheet | 10/2025

### phs-scalefree® NEW PERSPECTIVES ON THE PRODUCTION OF HIGH-STRENGTH COMPONENTS

**phs-scalefree® stands for steel grades up to 2000 MPa with a thin zinc coating for hot forming.** The material and processing properties of this voestalpine development are impressive.

The single-phase zinc ferrite coating promises scale protection with unique hot forming properties and provides additional corrosion protection.

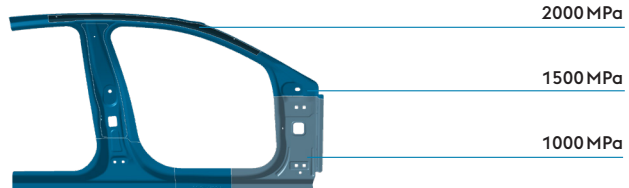
Combining weight reduction, enhanced crash performance and a streamlined body structure, the door ring with galvanized press-hardening steel represents an innovative solution for modern car body designs.

#### Available voestalpine phs scalefree® grades:

- » phs-scalefree 2000
- » phs-scalefree 1500
- » phs-scalefree 1000
- » phs-scalefree 490

#### Newly designed door ring

Galvanized press-hardened door ring with phs-scalefree® made from a laser-welded blank



Premium quality  
with reduced carbon footprint

phs-scalefree®  
greentec steel

## UNBEATABLE IN MANUFACTURING AND COMPONENT QUALITY



### Thin zinc coating for processability

- » A special PHS furnace atmosphere is not required. The zinc layer protects the PHS surface from scaling – the high emissivity of the zinc-iron surface ensures rapid heating and makes it possible to reduce the furnace temperature.
- » phs-scalefree® steel grades exhibit very good adhesive bonding properties because of their special surface coating.
- » phs-scalefree® is designed for the direct or indirect process.



### PHS process for freedom of design

- » More demanding geometries can be produced in the direct process as a result of the lower friction in the hot forming tool (compared to uncoated or aluminum-silicon coated PHS).
- » Complex geometries, including undercuts, are possible in the indirect process as a result of cold forming in the initial process step.



### Lightweight design for sustainability

- » High strengths up to 2000 MPa ensure lower thicknesses that lead to lower fuel consumption and reduce carbon emissions.
- » Larger components such as galvanized door rings lead to less material use. The number of individual components and joined areas can be reduced.



### 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.



### 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.



## ALL-IN-ONE EXPERT

### From coil to galvanized door ring

- » Steel and manufacturing from a single source
- » Benefit from the materials expertise of the voestalpine Steel Division and the manufacturing expertise of the voestalpine Metal Forming Division.



Premium quality with reduced carbon footprint

**phs-scalefree®**  
greentec steel

Hot-dip galvanized steel strip – greentec steel Edition

Max. carbon footprint 2,13 kg CO<sub>2</sub>e per kg of steel <sup>1)</sup>

<sup>1)</sup> per EN 15804+A2 (EPD methodology) cradle to gate

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

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Please find out more about phs-scalefree® at  
[www.voestalpine.com/ultralights/en/phs-scalefree](http://www.voestalpine.com/ultralights/en/phs-scalefree)



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**voestalpine**

ONE STEP AHEAD.