



S420GD

Structural Steels

Material no.	1.0239
according to	DIN EN 10346/ DIN EN 10143

General information

The steel grade S420GD is according to the specifications of the standard DIN EN 10025 and is classified as hot-dipped galvanized strip and sheet according to DIN EN 10346:2015-10, especially in the field of structural steels. Structural steels, as being mainly low-carbon steels, are used in a wide range of applications, not least because of their suitability for welding. The fine subdivision of the structural steels, from S220GD to S550GD, allows the choice of the material and thus of the mechanical parameters to meet the requirements. This range of application is extended, for example with the S390GD, by the application of hot-dip coatings (+Z, +ZM) and other coatings (FolaSal®1)), which provide corrosion protection appropriate to the area of application, even after forming processes.

1) FolaSal®: Organically coated composite material, coating of galvanized surfaces with puddles (e.g. made of polyester or epoxies) and/or films.

Chemical composition²⁾

(in percent weight)

	min. in %	max. in %
C		0.20
Si		0.60
Mn		1.70
P		0.10
S		0.045

2) Heat analysis

Mechanical properties³⁾⁴⁾

Yield strength R_{0.2} in MPa
≥ 420
Tensile strength R_m in MPa
≥ 480 (≤ 600 ⁵⁾)
Total elongation A₈₀ in %
≥ 15

3) Mechanical properties on cold rolled strip material

4) The samples for the tensile test are taken along the rolling direction.

5) Guide value

Form of delivery

The steel is produced as cold-rolled strip in nominal thicknesses from 0.65 mm to 2.50 mm and in widths according to the SZFG delivery programme (strength class C). Further specifications are available on request. Test certificates according to DIN EN 10204 will be issued if required.

Available dimension

Thickness in mm	Width in mm
0.65 – 0.70	900 – 1,450
0.71 – 0.87	900 – 1,500
0.88 – 1.23	900 – 1,550
1.24 – 1.95	900 – 1,730
1.96 – 2.00	900 – 1,800
2.01 – 2.50	900 – 1,600

Microstructure

In the cold rolled condition, S420GD has a largely ferritic and fine-grained structure with isolated cementite precipitations and a typical ASTM grain size of 12 to 13. A process control adapted to the alloying concept ensures the zinc adhesion even according to the requirements of the VDA test sheet.



Figure 1: Microstructure images S420GD, resolution 200:1

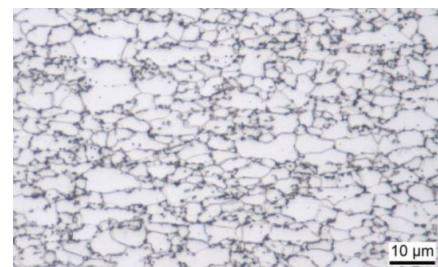


Abbildung 2: Mikrogefügeaufnahmen S420GD, Auflösung 1000:1





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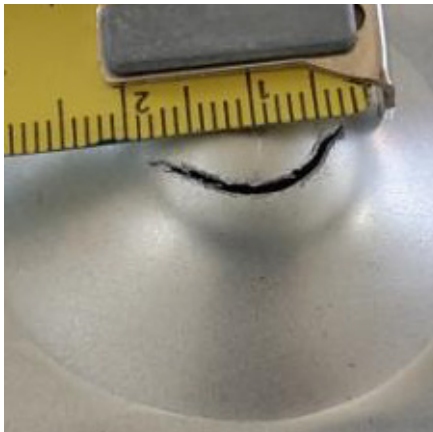


Figure 3: Zinc adhesion test for a S420GD+Z275, ball impact test according to SEP test sheet



Figure 4: Zinc adhesion test for a S420GD+Z275, adhesive bead test according to VDA test sheet

Usage

Hot-dipped galvanized flat products, such as the S420GD, can be used in many different ways. These steel grades are particularly suitable for use in the construction industry due to their good cold formability and sufficient tensile strength values above 480 MPa. Possible areas of application, e.g. for sectional steel, strip steel or thin sheet, are in mechanical engineering, vehicle construction or the building trade. The combination of weldability, formability and strength, especially considering the various coating possibilities, opens up a universal field of application for the higher strength structural steels, here the S420GD, at comparably low costs.

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