







Hot-dip galvanized sheet

| Delivery range in mm | Coils  | Slit strips  | Cut-to-length sheets  |
|----------------------|---|---|--|
| Thickness | 0,4 - 4 | 0,4 - 4 | 0,4 - 4 |
| Width | 400 - 1650 | 30 - 1650 | 200 - 1650 |
| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

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| Width | 400 - 1650 | 30 - 1650 | 200 - 1650 |
| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.



Soft grades – Continuously hot-dip refined strip and sheet made from soft steels for cold forming EN 10346 : 2015

| Chemical composition (melt analysis) of soft steels for cold forming | | | | | | | | | |
|--|--------------|--|---|-----------|-----------|----------|----------|-----------|--|
| Steel grade/type | | Symbol for the type of surface finishing | Chemical composition Percentage by mass | | | | | | |
| Code | Material no. | | C max. % | Si max. % | Mn max. % | P max. % | S max. % | Ti max. % | |
| DX51D | 1.0917 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.18 | 0.5 | 1.20 | 0.12 | 0.045 | 0.30 | |
| DX52D | 1.0918 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |
| DX53D | 1.0951 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |
| DX54D | 1.0952 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |
| DX55D | 1.0962 | +AS | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |
| DX56D | 1.0963 | +Z, +ZF, +ZA, +AS, +ZM | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |
| DX57D | 1.0853 | +Z, +ZF, +ZA, +AS, +ZM | 0.12 | 0.5 | 0.60 | 0.10 | 0.045 | 0.30 | |

Z = Hot-dip galvanized ZF = Galvannealed ZA = Galfan AZ = Galvalume AS = Hot-dip aluminized ZM = Zinc Magnesium

| Mechanical properties (lat.) | | | | | | | |
|------------------------------|--------------|--|---|--|---|--|---|
| Steel grade/type | | Symbol for the type of surface finishing | Elongation limit Re ¹⁾ MPa | Tensile strength R _m MPa | Fracture elongation A ₈₀₋₂₎ % min. | Vertical anisotropy r ₉₀ min | Work hardening exponent n ₉₀ min. |
| Code | Material no. | | | | | | |
| DX51D | 1.0917 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | – | 270 – 500 | 22 | – | – |
| DX52D | 1.0918 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 140 – 300 3) | 270 – 420 | 26 | – | – |
| DX53D | 1.0951 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 140 – 260 | 270 – 380 | 30 | – | – |
| DX54D | 1.0952 | +Z, +ZA | 120 – 220 | 260 – 350 | 36 | 1.6 4) | 0.18 |
| DX54D | 1.0952 | +ZF, +ZM | 120 – 220 | 260 – 350 | 34 | 1.4 4) | 0.18 |
| DX54D | 1.0952 | +AZ | 120 – 220 | 260 – 350 | 36 | – | – |
| DX54D | 1.0952 | +AS | 120 – 220 | 260 – 350 | 34 | 1.4 4)5) | 0.18 5) |
| DX55D 6) | 1.0962 | +AS | 140 – 240 | 270 – 370 | 30 | – | – |
| DX56D | 1.0963 | +Z, +ZA | 120 – 180 | 260 – 350 | 39 | 1.9 4) | 0.21 |
| DX56D | 1.0963 | +ZF, +ZM | 120 – 180 | 260 – 350 | 37 | 1.7 4)5) | 0.20 5) |
| DX56D | 1.0963 | +AS, +AZ | 120 – 180 | 260 – 350 | 39 | 1.7 4)5) | 0.20 5) |
| DX57D | 1.0853 | +Z, +ZA | 120 – 170 | 260 – 350 | 41 | 2.1 4) | 0.22 |
| DX57D | 1.0853 | +ZF, +ZM | 120 – 170 | 260 – 350 | 39 | 1.9 4)5) | 0.21 4) |
| DX57D | 1.0853 | 380 – 480 | 120 – 170 | 260 – 350 | 41 | 1.9 4)5) | 0.21 4) |

1) If the yield point is not pronounced, the values for the 0.2 % elongation limit (R_{e0.2}) apply; if pronounced, the values for the lower yield point (R_{eL}) apply.
 2) Reduced minimum values for fracture elongation apply for product thicknesses of: 0.50 mm < t ≤ 0.70 mm (2 units less); 0.35 mm < t ≤ 0.50 mm (minus 4 units) and t ≤ 0.35 mm (minus 7 units).
 3) For class A surfaces, the maximum value for the yield point is Re = 360 MPa.
 4) For 1.5 mm < t < 2 mm, the r₉₀-minimum value is reduced by 0.2. For t ≥ 2 mm, the r₉₀-minimum value is reduced by 0.4.
 5) The n₉₀-minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.2; 0.35 mm < t ≤ 0.50 mm by 0.4 and t ≤ 0.35 mm by 0.6. The n₉₀-minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.01; 0.35 mm < t ≤ 0.50 mm by 0.03 and t ≤ 0.35 mm by 0.04.
 6) Please note the minimum fracture elongation value for DX55D+S products, which does not follow the usual system. DX55D + AS products are marked according to the best heat resistance. (1 MPa = 1 N/mm²)






Construction steels – Continuously hot-dip coated steel strip and sheet made of construction steels EN 10346 : 2015

| Chemical composition (melt analysis) | | | | | | |
|--------------------------------------|--------------|--|----------|-----------|-----------|----------|
| Steel grade/type | | Symbol for the type of surface finishing | C max. % | Si max. % | Mn max. % | P max. % |
| Code | Material no. | | | | | |
| S220GD | 1.0241 | +Z, +ZF, +ZA, +AZ, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |
| S250GD | 1.0242 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |
| S280GD | 1.0244 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |
| S320GD | 1.0250 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |
| S350GD | 1.0529 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |
| S390GD | 1.0238 | +Z, +ZF, +ZA, +ZM, +AZ | 0.20 | 0.60 | 1.70 | 0.10 |
| S420GD | 1.0239 | +Z, +ZF, +ZA, +ZM, +AZ | 0.20 | 0.60 | 1.70 | 0.10 |
| S450GD | 1.0233 | +Z, +ZF, +ZA, +ZM, +AZ | 0.20 | 0.60 | 1.70 | 0.10 |
| S550GD | 1.0531 | +Z, +ZF, +ZA, +AZ, +ZM | 0.20 | 0.60 | 1.70 | 0.10 |

| Mechanical properties (long.) | | | | | |
|-------------------------------|--------------|--|--|---|---|
| Steel grade/type | | Symbol for the type of surface finishing | Elongation limit R _{e0.2} ¹⁾ MPa | Tensile strength R _m ²⁾ MPa | Fracture elongation A ₈₀₋₃₎ % min. |
| Code | Material no. | | | | |
| S220GD | 1.0241 | +Z, +ZF, +ZA, +AZ, +ZM | 220 | 300 | 20 |
| S250GD | 1.0242 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 250 | 330 | 19 |
| S280GD | 1.0244 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 280 | 360 | 18 |
| S320GD | 1.0250 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 320 | 390 | 17 |
| S350GD | 1.0529 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 350 | 420 | 16 |
| S390GD | 1.0238 | +Z, +ZF, +ZA, +ZM, +AZ | 390 | 460 | 16 |
| S420GD | 1.0239 | +Z, +ZF, +ZA, +ZM, +AZ | 420 | 480 | 15 |
| S450GD | 1.0233 | +Z, +ZF, +ZA, +ZM, +AZ | 450 | 510 | 14 |
| S550GD | 1.0531 | +Z, +ZF, +ZA, +AZ, +ZM | 550 | 560 | – |




1) If the yield point is pronounced, the values for the upper yield point (R_{eH}) apply.
 2) For all steel grades, with the exception of S550GD, a range of 140 MPa can be expected for tensile strength.
 3) Reduced minimum values for fracture elongation apply for product thicknesses of t > 0.50 mm (4 units less) and for 0.50 mm < t ≤ 0.70 mm (2 units less).

Hot-dip galvanized sheet


| Delivery range in mm | Coils  | Slit strips  | Cut-to-length sheets  |
|----------------------|---|---|--|
| Thickness | 0,4 - 4 | 0,4 - 4 | 0,4 - 4 |
| Width | 400 - 1650 | 30 - 1650 | 200 - 1650 |
| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Hot-dip galvanized sheet

| Delivery range in mm | Coils  | Slit strips  | Cut-to-length sheets  |
|----------------------|---|---|--|
| Thickness | 0,4 - 4 | 0,4 - 4 | 0,4 - 4 |
| Width | 400 - 1650 | 30 - 1650 | 200 - 1650 |
| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

 **Microalloyed grades – Continuously hot-dip coated steel strip and sheet made of steels with a high yield point for cold forming acc. to EN 10346 : 2015**




| Steel grade/type | | Symbol for the type of surface finishing | Chemical composition Percentage by mass | | | | | | | | |
|------------------|--------------|--|---|-----------|-----------|----------|----------|----------------------------|-----------|-----------|--|
| Code | Material no. | | C max. % | Si max. % | Mn max. % | P max. % | S max. % | Al _{total} min. % | Nb max. % | Ti max. % | |
| HX160YD | 1.0910 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 0.01 | 0.30 | 0.60 | 0.06 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX180YD | 1.0921 | | 0.01 | 0.30 | 0.70 | 0.06 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX180BD | 1.0914 | | 0.06 | 0.30 | 0.70 | 0.06 | 0.025 | ≥ 0.015 | 0.09 | 0.12 | |
| HX220YD | 1.0923 | | 0.01 | 0.30 | 0.90 | 0.08 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX220BD | 1.0919 | | 0.08 | 0.50 | 0.70 | 0.08 | 0.025 | ≥ 0.015 | 0.09 | 0.12 | |
| HX260YD | 1.0926 | | 0.01 | 0.50 | 1.60 | 0.10 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX260BD | 1.0924 | | 0.10 | 0.50 | 1.00 | 0.10 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX260LAD | 1.0929 | | 0.11 | 0.50 | 1.00 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX300YD | 1.0927 | | 0.015 | 0.30 | 1.60 | 0.10 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX300BD | 1.0930 | | 0.11 | 0.30 | 0.80 | 0.12 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX300LAD | 1.0932 | | 0.12 | 0.50 | 1.40 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX340BD | 1.0945 | | 0.11 | 0.50 | 0.80 | 0.12 | 0.025 | ≥ 0.010 | 0.09 | 0.12 | |
| HX340LAD | 1.0933 | | 0.12 | 0.50 | 1.40 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX380LAD | 1.0934 | | 0.12 | 0.50 | 1.50 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX420LAD | 1.0935 | | 0.12 | 0.50 | 1.60 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX460LAD | 1.0990 | | 0.15 | 0.50 | 1.70 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |
| HX500LAD | 1.0991 | | 0.15 | 0.50 | 1.70 | 0.030 | 0.025 | ≥ 0.015 | 0.09 | 0.15 | |

| Steel grade/type | | Symbol for the type of surface finishing | Mechanical properties (lat.) | | | | | |
|------------------|--------------|--|--|---|---|--|--|--|
| Code | Material no. | | Elongation limit 0.2 % R _{p0.2} ¹⁾ N/mm ² | Bake hardening index BH ₂ MPa min. N/mm ² | Tensile strength R _m MPa N/mm ² | Fracture elongation A ₉₀ ²⁾³⁾ % min. quer | Vertical anisotropy r ₉₀ ³⁾⁴⁾ min. | Work hardening exponent n ₉₀ min. |
| HX160YD | 1.0910 | +Z, +ZF, +ZA, +AZ, +AS, +ZM | 160 – 220 | – | 300 – 360 | 37 | 1.9 | 0.20 |
| HX180YD | 1.0921 | | 180 – 240 | – | 330 – 390 | 34 | 1.7 | 0.18 |
| HX180BD | 1.0914 | | 180 – 240 | 30 | 290 – 360 | 34 | 1.5 | 0.16 |
| HX220YD | 1.0923 | | 220 – 280 | – | 340 – 420 | 32 | 1.5 | 0.17 |
| HX220BD | 1.0919 | | 220 – 280 | 30 | 320 – 400 | 32 | 1.2 | 0.15 |
| HX260YD | 1.0926 | | 260 – 320 | – | 380 – 440 | 30 | 1.4 | 0.16 |
| HX260BD | 1.0924 | | 260 – 320 | 30 | 360 – 440 | 28 | – | – |
| HX260LAD | 1.0929 | | 260 – 320 | – | 350 – 430 | 26 | – | – |
| HX300YD | 1.0927 | | 300 – 360 | – | 390 – 470 | 27 | 1.3 | 0.15 |
| HX300BD | 1.0930 | | 300 – 360 | 30 | 400 – 480 | 26 | – | – |
| HX300LAD | 1.0932 | | 300 – 380 | – | 380 – 480 | 23 | – | – |
| HX340BD | 1.0945 | | 340 – 400 | 30 | 440 – 520 | 24 | – | – |
| HX340LAD | 1.0933 | | 340 – 420 | – | 410 – 510 | 21 | – | – |
| HX380LAD | 1.0934 | | 380 – 480 | – | 440 – 560 | 19 | – | – |
| HX420LAD | 1.0935 | | 420 – 520 | – | 470 – 590 | 17 | – | – |
| HX460LAD | 1.0990 | | 460 – 560 | – | 500 – 640 | 15 | – | – |
| HX500LAD | 1.0991 | | 500 – 620 | – | 530 – 690 | 13 | – | – |

1) If the yield point is pronounced, the values for the lower yield point (R_{p0.2}) apply
 2) Reduced minimum values for fracture elongation apply for product thicknesses of: 0.50 mm < t ≤ 0.70 mm (minus 2 units) 0.35 mm < t ≤ 0.50 mm (minus 4 units) and t ≤ 0.35 mm (minus 7 units).
 3) For AS-, AZ-, ZF- and ZM- coatings, the A₉₀-minimum values are reduced by 2 units and the r₉₀-minimum values by 0.2.
 4) For product thicknesses 1.5 mm < t < 1.99 mm, the r₉₀-minimum values are reduced by 0.2. For product thicknesses ≥ 2 mm, the r₉₀-minimum values are reduced by 0.4.
 5) The r₉₀-minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.2; 0.35 mm < t ≤ 0.50 mm by 0.4 and t ≤ 0.35 mm by 0.6. The n₉₀-minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.01; 0.35 mm < t ≤ 0.50 mm by 0.03 and t ≤ 0.35 mm by 0.04 (1 MPa = 1 N/mm²).
 B = Bake hardening LA = Low alloy (microalloyed) Y = Interstitial free (IF steel)



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| Delivery range in mm | Coils  | Slit strips  | Cut-to-length sheets  |
|----------------------|---|---|--|
| Thickness | 0,4 - 4 | 0,4 - 4 | 0,4 - 4 |
| Width | 400 - 1650 | 30 - 1650 | 200 - 1650 |
| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

 **Explanation and offer of coatings and surfaces**

| Coating mass | | | | | |
|--|--|-----------------------|--|--------------------|---------------------------|
| Coating code no. | Min. coating volume, on both sides (g/m ²) | | Theoretical reference value for coating thickness per side in µm | | Density g/cm ³ |
| | Three-surface sample | Single-surface sample | Typical value ¹⁾ | Area ²⁾ | |
| Zinc coating volume (Z) | | | | | |
| Z100 | 100 | 85 | 7 | 5 - 12 | 7.1 |
| Z140 | 140 | 120 | 10 | 7 - 15 | 7.1 |
| Z200 | 200 | 170 | 14 | 10 - 20 | 7.1 |
| Z225 | 225 | 195 | 16 | 11 - 22 | 7.1 |
| Z275 | 275 | 235 | 20 | 13 - 27 | 7.1 |
| Z350 | 350 | 300 | 25 | 17 - 33 | 7.1 |
| Z450 | 450 | 385 | 32 | 22 - 42 | 7.1 |
| Z600 | 600 | 510 | 42 | 29 - 55 | 7.1 |
| Zinc/iron alloy coating volume (ZF) | | | | | |
| ZF100 | 100 | 85 | 7 | 5 - 12 | 7.1 |
| ZF120 | 120 | 100 | 8 | 6 - 13 | 7.1 |
| Zinc/aluminium alloy coating volume (ZA) | | | | | |
| ZA095 | 95 | 80 | 7 | 5 - 12 | 6.6 |
| ZA130 | 130 | 110 | 10 | 7 - 15 | 6.6 |
| ZA185 | 185 | 155 | 14 | 10 - 20 | 6.6 |
| ZA200 | 200 | 170 | 15 | 11 - 21 | 6.6 |
| ZA255 | 255 | 215 | 20 | 15 - 27 | 6.6 |
| ZA300 | 300 | 255 | 23 | 17 - 31 | 6.6 |
| Aluminium/zinc alloy coating volume (AZ) not for multiphase steels | | | | | |
| AZ100 | 100 | 85 | 13 | 9 - 19 | 3.8 |
| AZ150 | 150 | 130 | 20 | 15 - 27 | 3.8 |
| AZ185 | 185 | 160 | 25 | 19 - 33 | 3.8 |
| Aluminium/silicon alloy coating volume (AS) not for multiphase steels | | | | | |
| AS060 | 60 | 45 | 10 | 7 - 15 | 3.0 |
| AS080 | 80 | 60 | 14 | 10 - 20 | 3.0 |
| AS100 | 100 | 75 | 17 | 12 - 23 | 3.0 |
| AS120 | 120 | 90 | 20 | 15 - 27 | 3.0 |
| AS150 | 150 | 115 | 25 | 19 - 33 | 3.0 |

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| Length | N/A | N/A | 220 - 6000 |

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

| Coating mass | | | | | |
|---|--|-----------------------|--|--------------------|---------------------------|
| Coating code no. | Min. coating volume, on both sides (g/m ²) | | Theoretical reference value for coating thickness per side in µm | | Density g/cm ³ |
| | Three-surface sample | Single-surface sample | Typical value ¹⁾ | Area ²⁾ | |
| Coating volume of zinc-magnesium alloy (ZM) ³⁾ | | | | | |
| ZM060 | 60 | 50 | 4,5 | 4 - 8 | 6.2 - 6.6 |
| ZM070 | 70 | 60 | 5,5 | 4 - 8 | 6.2 - 6.6 |
| ZM080 | 80 | 70 | 6 | 4 - 10 | 6.2 - 6.6 |
| ZM090 | 90 | 75 | 7 | 5 - 10 | 6.2 - 6.6 |
| ZM100 | 100 | 85 | 8 | 5 - 11 | 6.2 - 6.6 |
| ZM120 | 120 | 100 | 9 | 6 - 14 | 6.2 - 6.6 |
| ZM130 | 130 | 110 | 10 | 7 - 15 | 6.2 - 6.6 |
| ZM140 | 140 | 120 | 11 | 8 - 16 | 6.2 - 6.6 |
| ZM150 | 150 | 130 | 11,5 | 8 - 17 | 6.2 - 6.6 |
| ZM160 | 160 | 130 | 12 | 8 - 17 | 6.2 - 6.6 |
| ZM175 | 175 | 145 | 13 | 9 - 18 | 6.2 - 6.6 |
| ZM190 | 190 | 160 | 15 | 10 - 20 | 6.2 - 6.6 |
| ZM200 | 200 | 170 | 15 | 10 - 20 | 6.2 - 6.6 |
| ZM250 | 250 | 215 | 19 | 13 - 25 | 6.2 - 6.6 |
| ZM300 | 300 | 255 | 23 | 17 - 30 | 6.2 - 6.6 |
| ZM310 | 310 | 265 | 24 | 18 - 31 | 6.2 - 6.6 |
| ZM350 | 350 | 300 | 27 | 19 - 33 | 6.2 - 6.6 |
| ZM430 | 430 | 365 | 35 | 26 - 46 | 6.2 - 6.6 |

1) Layer thicknesses can be calculated from the coating volumes.
 2) Users may assume that these limits will be maintained on the top and bottom sides.
 3) More ZM coatings available on request.

Surfaces

Surface type

- NA = Usual spangle different size with usual surface
- MA = Small spangle with usual surface
- MB = Re-rolled with improved surface
- MC = Re-rolled with best surface
- A = Usual surface
- B = Improved surface
- C = Best surface

Surface treatment

- C = Chemical passivation (Cr-frei + Cr3+)
- O = Oiled
- CO = Chemical passivation with oiling
- P = Phosphatized
- PO = Phosphatized with oiling
- S = Sealed
- U = Untreated

Coating variations

- +Z = Galvanized (99% Zn)
- +ZF = Zinc-iron alloy (Galvannealed)
- +ZA = Zinc aluminium (Galfan, Zn + 5% Al)
- +AZ = Aluminium zinc (Galvalume 55% Al + 1.6% Si + Zn)
- +AS = Aluminium-silicon coatings (11% Si + Al)
- +ZM = Zinc magnesium (1 - 2% Mg + 1 - 2% Al + Zn)*