

Product overview: Steels for the automotive industry

Product information



thyssenkrupp

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Mild steels

| Steel grade | Reference grade DIN EN 10111 | Surface refinements | | | | | |
|-------------|---------------------------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● DD11 | DD11 | ● | | | | | |
| ● DD12 | DD12 | ● | | | | | |
| ● DD13 | DD13 | ● | | | | | |
| ● DD14 | DD14 | ● | | | | | |

Deep-drawing steel

| Steel grade | Reference grade DIN EN 10130, 10152 | Surface refinements | |
|-------------|--|---------------------|----|
| | | UC | EG |
| ● DC01 | DC01 | ● | ● |
| ● DC03 | DC03 | ● | ● |
| ● DC04 | DC04 | ⊙ | ⊠ |
| ● DC05 | DC05 | ⊙ | ⊠ |
| ● DC06 | DC06 | ⊙ | ⊠ |
| ● DC07 | DC07 | ⊙ | ⊠ |

Deep-drawing steel

| Steel grade | Reference grade DIN EN 10346 | Surface refinements | | | | | |
|-------------|---------------------------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● DX51D | DX51D | | | ⊙ | ⊙ | ⊙ | ● |
| ● DX52D | DX52D | | | ⊙ | ⊙ | ⊙ | ● |
| ● DX53D | DX53D | | | ⊙ | ⊙ | ⊙ | ● |
| ● DX54D | DX54D | | | ⊠ | ⊙ | ⊠ | ● |
| ● DX56D | DX56D | | | ⊠ | ⊙ | ⊠ | ● |
| ● DX57D | DX57D | | | ⊠ | ● | ⊠ | |
| ● DX58D | – | | | ● | | | |

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- Hot-rolled flat products
- Cold-rolled/hot-dip coated flat products
- Serial production for unexposed applications
- ⊙ Serial production for unexposed and exposed applications
- ⊠ Serial production for unexposed and exposed applications as well as exposed applications in primetex® finish

- UC Uncoated
- EG Electrogalvanized zinc coating
- GI Hot-dip zinc coating
- GA Galvannealed
- ZM ZM Ecoprotect®
- AS Aluminum-silicon coating

Mild steels

| | | Surface refinements | | | | | |
|---------------------------|---------------------------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| Deep-drawing steel | | | | | | | |
| Steel grade | Reference grade VDA 239-100 | | | | | | |
| ● HR2 | HR2 | ● | | | | | |
| ● CR1 | CR1 | ● | ● | ⊙ | ⊙ | ⊙ | ● |
| ● CR2 | CR2 | ● | ● | ⊙ | ⊙ | ⊙ | ● |
| ● CR3 | CR3 | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | ● |
| ● CR4 | CR4 | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | ● |
| ● CR5 | CR5 | ⊙ | ⊠ | ⊠ | ● | ⊠ | |
| Deep-drawing steel | | | | | | | |
| Steel grade | Reference grade DIN EN 10346 | | | | | | |
| ● lightprotect® AS DX52D | DX52D | | | | | | ● |
| ● lightprotect® AS DX53D | DX53D | | | | | | ● |
| ● lightprotect® AS DX54D | DX54D | | | | | | ● |
| ● lightprotect® AS DX56D | DX56D | | | | | | ● |

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Conventional higher and high-strength steels

| Steel grade | Reference grade DIN EN 10149-2 | Surface refinements | | | | | |
|----------------------------|-----------------------------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● perform [®] 300 | – | ● | | | | | |
| ● perform [®] 315 | S315MC | ● | | | | | |
| ● perform [®] 340 | – | ● | | | | | |
| ● perform [®] 355 | S355MC | ● | | | | | |
| ● perform [®] 380 | – | ● | | | | | |
| ● perform [®] 420 | S420MC | ● | | | | | |
| ● perform [®] 460 | S460MC | ● | | | | | |
| ● perform [®] 500 | S500MC | ● | | | | | |
| ● perform [®] 550 | S550MC | ● | | | | | |
| ● perform [®] 600 | S600MC | ● | | | | | |
| ● perform [®] 650 | S650MC | ● | | | | | |
| ● perform [®] 700 | S700MC | ● | | | | | |

Micro-alloyed steel

| Steel grade | Reference grade DIN EN 10268, 10346 | Reference grade VDA 239-100 | UC | EG | GI | GA | ZM | AS |
|------------------------|--|--------------------------------|----|----|----|----|----|----|
| ● MHZ [®] 220 | – | CR210LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 260 | HC260LA/HX260LAD | CR240LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 300 | HC300LA/HX300LAD | CR270LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 340 | HC340LA/HX340LAD | CR300LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 380 | HC380LA/HX380LAD | CR340LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 420 | HC420LA/HX420LAD | CR380LA | ● | ● | ● | ● | ● | ● |
| ● MHZ [®] 460 | HC460LA/HX460LAD | CR420LA | | | ● | | ● | |
| ● MHZ [®] 500 | HC500LA/HX500LAD | CR460LA | | | ● | | ● | |

Higher-strength steel

| Steel grade | Reference grade | UC | EG | GI | GA | ZM | AS |
|------------------------|-----------------|----|----|----|----|----|----|
| ● EHZ [®] 550 | – | | | | | ● | |

- Hot-rolled flat products
- Cold-rolled/hot-dip coated flat products
- Serial production for unexposed applications

- UC Uncoated
- EG Electrogalvanized zinc coating
- GI Hot-dip zinc coating
- GA Galvannealed
- ZM ZM Ecoprotect[®]
- AS Aluminum-silicon coating

Conventional higher and high-strength steels

| Steel grade | Reference grade DIN EN 10152, 10268, 10346 | Surface refinements | | | | | |
|-------------|--|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● HX 160 | HX160YD | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| ● HX 180 | HC180Y/HX180YD | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | |
| ● HX 220 | HC220Y/HX220YD | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | |
| ● HX 260 | HC260Y/HX260YD | ⊙ | ● | ⊙ | ⊙ | ⊙ | |
| ● HX 280 | – | | | ● | | | |

Higher-strength IF steel

| Steel grade | Reference grade VDA 239-100 | UC | EG | GI | GA | ZM | AS |
|-------------|--------------------------------|----|----|----|----|----|----|
| ● CR160IF | CR160IF | ⊙ | ⊙ | ⊙ | ● | | |
| ● CR180IF | CR180IF | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | |
| ● CR210IF | CR210IF | ⊙ | ⊠ | ⊠ | ⊙ | ⊠ | |
| ● CR240IF | CR240IF | ⊙ | ● | ⊙ | ⊙ | ⊙ | |

Bake hardening steel

| Steel grade | Reference grade DIN EN 10152, 10268, 10346 | UC | EG | GI | GA | ZM | AS |
|-------------|--|----|----|----|----|----|----|
| ● BHZ 180 | HC180B/HX180BD | ⊙ | ⊙ | ⊙ | ⊙ | ⊠ | |
| ● BHZ 220 | HC220B/HX220BD | ⊙ | ⊙ | ⊙ | ⊙ | ⊠ | |
| ● BHZ 260 | HC260B/HX260BD | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| ● BHZ 300 | HC300B/HX300BD | ● | ● | ● | ● | | |

Bake hardening steel

| Steel grade | Reference grade VDA 239-100 | UC | EG | GI | GA | ZM | AS |
|-------------|--------------------------------|----|----|----|----|----|----|
| ● CR180BH | CR180BH | ⊙ | ⊙ | ⊙ | ⊙ | ⊠ | |
| ● CR210BH | CR210BH | ⊙ | ⊙ | ⊙ | ⊙ | ⊠ | |
| ● CR240BH | CR240BH | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |

Higher-strength stretch-forming steel

| Steel grade | Reference grade DIN EN 10152, 10268 | UC | EG | GI | GA | ZM | AS |
|-------------|---|----|----|----|----|----|----|
| ● HSZ 220 | HC220I | ⊙ | ⊙ | | | | |

Work hardening steel

| Steel grade | Reference grade | UC | EG | GI | GA | ZM | AS |
|-------------|-----------------|----|----|----|----|----|----|
| ● WHZ 300 | – | ⊙ | ⊙ | ⊙ | ● | | |
| ● WHZ 420 | – | ● | ● | ● | ● | | |

- Cold-rolled/hot-dip coated flat products
- Serial production for unexposed applications
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- UC Uncoated
- EG Electrogalvanized zinc coating
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- AS Aluminum-silicon coating

Advanced multi-phase steels

| | | | Surface refinements | | | | | |
|----------------------------|--|--------------------------------|---------------------|----|----|----|----|----|
| | | | UC | EG | GI | GA | ZM | AS |
| Dual-phase steel | | | | | | | | |
| Steel grade | Reference grade DIN EN 10152, 10338, 10346 | Reference grade VDA 239-100 | | | | | | |
| ● DP-W® 300Y530T | – | – | ● | ● | | | | |
| ● DP-W® 330Y580T | HDT580X | HR330Y580T-DP | ● | ● | | | | |
| ● DP-W® 300Y580T | – | – | ● | | | | | |
| ● DP-W® 700 | – | – | ● | ● | | | | |
| ● DP-K® 290Y490T | HCT490X | CR290Y490T-DP | ⊙ | ⊙ | ⊠ | ⊙ | ⊠ | |
| ● DP-K® 330Y590T | HCT590X | CR330Y590T-DP | ● | ● | ● | ● | ● | |
| ● DP-K® 330Y590T DH | – | – | | | ● | | | |
| ● DP-K® 34/60 HF | – | – | ● | ● | ● | | | |
| ● DP-K® 420Y590T | – | – | | | ● | | | |
| ● DP-K® 440Y780T | HCT780X | CR440Y780T-DP | | | ● | | | |
| ● DP-K® 440Y780T DH | – | – | | | ● | | | |
| ● DP-K® 590Y980T | HCT980X | CR590Y980T-DP | | | ● | ● | | |
| ● DP-K® 60/98 | – | – | ● | ● | | | | |
| ● DP-K® 700Y980T | HCT980XG | CR700Y980T-DP | ● | ● | ● | ● | | |
| ● DP-K® 780Y1180T | – | – | | | ● | | | |
| ● DP-K® 900Y1180T | – | – | ● | | ● | | | |
| Complex-phase steel | | | | | | | | |
| Steel grade | Reference grade DIN EN 10152, 10338, 10346 | Reference grade VDA 239-100 | | | | | | |
| ● CP-W® 660Y760T | HDT760C | HR660Y760T-CP | ● | ● | ● | | | |
| ● CP-W® 800 | – | – | ● | ● | ● | | | |
| ● CP-W® 1000 | – | – | ● | ● | | | | |
| ● CP-K® 570Y780T | HCT780C | CR570Y780T-CP | ● | ● | | | | |
| ● CP-K® 900Y1180T | – | CR900Y1180T-CP | ● | | ● | | | |

| | |
|----|--|
| ● | Hot-rolled flat products |
| ● | Cold-rolled/hot-dip coated flat products |
| ● | Serial production for unexposed applications |
| ⊙ | Serial production for unexposed and exposed applications |
| ⊠ | Serial production for unexposed and exposed applications as well as exposed applications in primetex® finish |
| UC | Uncoated |
| EG | Electrogalvanized zinc coating |
| GI | Hot-dip zinc coating |
| GA | Galvannealed |
| ZM | ZM Ecoprotect® |
| AS | Aluminum-silicon coating |

Advanced multi-phase steels

| | | | Surface refinements | | | | | |
|--|--|--------------------------------|---------------------|----|----|----|----|----|
| | | | UC | EG | GI | GA | ZM | AS |
| Ferrite-bainite-phase steel | | | | | | | | |
| Steel grade | Reference grade DIN EN 10152, 10346, 10338 | Reference grade VDA 239-100 | | | | | | |
| ● FB-W® 300Y450T | HDT450F | HR300Y450T-FB | ● | ● | ● | | | |
| ● FB-W® 460Y580T | HDT580F | HR440Y580T-FB | ● | ● | ● | | | |
| Retained-austenite steel (TRIP steel) | | | | | | | | |
| Steel grade | Reference grade DIN EN 10152, 10338, 10346 | Reference grade VDA 239-100 | | | | | | |
| ● RA-K® 400Y690T | HCT690T | CR400Y690T-TR | ● | | ● | | | |
| Martensitic-phase steel | | | | | | | | |
| Steel grade | Reference grade DIN EN 10152, 10338 | Reference grade VDA 239-100 | | | | | | |
| ● MS-W® 900Y1180T | HDT1180G1 | HR900Y1180T-MS | ● | | | | | |
| ● MS-W® 900Y1180T | – | – | | | ● | | | |

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- AS Aluminum-silicon coating

Steels with improved tolerances

| Steel grade | Reference grade DIN EN 10111, 10025, 10149-2 | Surface refinements | | | | | |
|--------------------|--|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● scalur® DD11 | DD11 | ● | | | | | |
| ● scalur® DD12 | DD12 | ● | | | | | |
| ● scalur® DD13 | DD13 | ● | | | | | |
| ● scalur® DD14 | DD14 | ● | | | | | |
| ● scalur® S235 | S235 | ● | | | | | |
| ● scalur® S315MC | S315MC | ● | | | | | |
| ● scalur® S355MC | S355MC | ● | | | | | |
| ● scalur® S420MC | S420MC | ● | | | | | |
| ● scalur® S460MC | S460MC | ● | | | | | |
| ● scalur® S500MC | S500MC | ● | | | | | |
| ● scalur® S550MC | S550MC | ● | | | | | |
| ● scalur® S600MC | S600MC | ● | | | | | |
| ● scalur® S650MC | S650MC | ● | | | | | |
| ● scalur® S700MC | S700MC | ● | | | | | |
| ● scalur® CP-W 800 | – | ● | | | | | |

 Hot-dip galvanized product
with improved tolerances

| Steel grade | Reference grade DIN EN 10346 | UC | EG | GI | GA | ZM | AS |
|----------------------|---------------------------------|----|----|----|----|----|----|
| ● scalur®+Z DX51D | DX51D | | | ● | | | |
| ● scalur®+Z DX52D | DX52D | | | ● | | | |
| ● scalur®+Z S220GD | S220GD | | | ● | | | |
| ● scalur®+Z S250GD | S250GD | | | ● | | | |
| ● scalur®+Z S280GD | S280GD | | | ● | | | |
| ● scalur®+Z S320GD | S320GD | | | ● | | | |
| ● scalur®+Z S350GD | S350GD | | | ● | | | |
| ● scalur®+Z S390GD | S390GD | | | ● | | | |
| ● scalur®+Z S420GD | S420GD | | | ● | | | |
| ● scalur®+Z HX260LAD | HX260LAD | | | ● | | | |
| ● scalur®+Z HX300LAD | HX300LAD | | | ● | | | |
| ● scalur®+Z HX340LAD | HX340LAD | | | ● | | | |
| ● scalur®+Z HX380LAD | HX380LAD | | | ● | | | |
| ● scalur®+Z HX420LAD | HX420LAD | | | ● | | | |
| ● scalur®+Z HX460LAD | HX460LAD | | | ● | | | |
| ● scalur®+Z HX500LAD | HX500LAD | | | ● | | | |
| ● scalur®+Z HDT760C | HDT760C | | | ● | | | |

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- AS Aluminum-silicon coating

Steels for hot forming

| Steel grade | Reference grade | Surface refinements | | | | | |
|---------------|-----------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● MBW-W® 1500 | – | ● | | | | | |
| ● MBW® 500 | – | | | | | | ● |
| ● MBW® 600 | – | | | | | | ● |
| ● MBW® 1500 | – | | | | | | ● |
| ● MBW-K® 1500 | – | ● | | | | | |
| ● MBW-K® 1900 | – | ● | | | | | |

Composites material for hot forming according to VDA 239-100

| Steel grade | Reference grade | UC | EG | GI | GA | ZM | AS |
|-----------------|-----------------|----|----|----|----|----|----|
| ● tribond® 1200 | – | | | | | | ● |
| ● tribond® 1400 | – | | | | | | ● |

Composites material

| Steel grade | Reference grade | Surface refinements | | | | | |
|----------------|-----------------|---------------------|----|----|----|----|----|
| | | UC | EG | GI | GA | ZM | AS |
| ● bondal® CPT | – | ● | ● | ● | | | ● |
| ● bondal® CB | – | ● | ● | ● | | | ● |
| ● bondal® CL | – | ● | ● | ● | | | ● |
| ● bondal® CLSi | – | ● | ● | ● | | | ● |

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- ZM ZM Ecoprotect®
- AS Aluminum-silicon coating

Electrical steel for e-mobility and high frequencies

| Thickness [mm] | Density [kg/dm ³] | Max. Core loss [W/kg] at 400 Hz 1.0 T | Min. Polarization [T] at | | | Yield strength R _{p0.2} [MPa] min. |
|-------------------|----------------------------------|--|-----------------------------|----------------|-----------------|---|
| | | | 2,500 [A/m] | 5,000 [A/m] | 10,000 [A/m] | |

Electrical steel, non grain oriented

| Steel grade | Reference grade DIN EN 10303 | Thickness [mm] | Density [kg/dm ³] | Max. Core loss [W/kg] at 400 Hz 1.0 T | Min. Polarization [T] at 2,500 [A/m] | Min. Polarization [T] at 5,000 [A/m] | Min. Polarization [T] at 10,000 [A/m] | Yield strength R _{p0.2} [MPa] min. |
|-------------------------------------|---------------------------------|-------------------|----------------------------------|--|---|---|--|---|
| powercore®020-130Y320 | N020-13 | 0.20 | 7.60 | 13 | 1.48 | 1.59 | 1.69 | 320 |
| powercore®020-150Y320 | N020-15 | 0.20 | 7.60 | 15 | 1.48 | 1.59 | 1.69 | 320 |
| powercore®027-150Y370 ¹⁾ | N027-15 | 0.27 | 7.60 | 15 | 1.52 | 1.61 | 1.73 | 370 ²⁾ |
| powercore®027-180Y370 ¹⁾ | N027-18 | 0.27 | 7.60 | 18 | 1.52 | 1.61 | 1.73 | 370 |
| powercore®030-160Y420 ¹⁾ | N030-16 | 0.30 | 7.60 | 16 | 1.52 | 1.61 | 1.73 | 420 |
| powercore®035-170Y410 ¹⁾ | N035-19 | 0.35 | 7.60 | 17 | 1.56 | 1.65 | 1.76 | 410 |
| powercore®032-190Y330 ¹⁾ | N035-19 | 0.32 | 7.65 | 19 | 1.55 | 1.64 | 1.76 | 330 |
| powercore®035-180Y400 | N035-19 | 0.35 | 7.60 | 18 | 1.52 | 1.61 | 1.73 | 400 |
| powercore®035-190Y390 | N035-22 | 0.35 | 7.60 | 19 | 1.52 | 1.61 | 1.73 | 390 |
| powercore®035-220Y300 ¹⁾ | N035-22 | 0.35 | 7.65 | 22 | 1.55 | 1.64 | 1.76 | 300 |

¹⁾ Steel grades are characterized by very good processing properties with advantages in final applications.

²⁾ Higher yield strength on request.

R_{p0.2} Yield strength to DIN EN ISO 6892-1 in rolling direction at room temperature

In addition to the listed steel grades for traction drives to DIN EN 10303, thyssenkrupp offers a wide range of standard grades to DIN EN 10106 which are used in auxiliary drives. See our general product range for all available electrical steel grades.

thyssenkrupp supplies the following steel grades as per the product information or the reference steel grades in accordance with the respective standards.

The latest information can be found on the Internet: www.thyssenkrupp-steel.com/publications