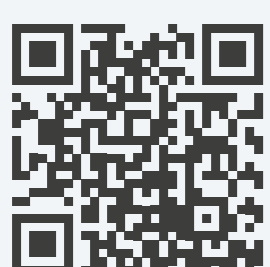


# Material grades

Material no.	Designation	Chemical composition	Strength	Colour	Character	Application
1.0577	DIN: S 355 J2 (St 52-3) AFNOR: A 52 FP AISI: A738	C Si Mn ≤ 0.22 ≤ 0.55 ≤ 1.60	132–185 HB (≈ 450–630 N/mm <sup>2</sup> )	Fluorescent yellow	<b>Structural steel</b> unalloyed, good weldability	For simple applications in mould, die, and jigs and fixtures construction
1.1730	DIN: C 45 U AFNOR: XC 48 AISI: 1045	C Si Mn 0.45 0.30 0.70	max. 215 HB (≈ max. 710 N/mm <sup>2</sup> )	Traffic blue	<b>Tool steel</b> unalloyed, suitable for flame hardening	Unhardened parts for mould, die and jig construction or plates and frames for mould bases and die sets
1.2083	DIN: X 40 Cr 14 AFNOR: Z 40 C 14 AISI: 420	C Si Mn Cr 0.40 0.40 0.30 13.00	max. 240 HB (≈ max. 800 N/mm <sup>2</sup> )	Lemon yellow	<b>Steel for through hardening</b> low corrosion, high-alloy	Cavity plates and inserts for the processing of plastics, mainly for corrosive plastics
1.2083 ESR	DIN: X 40 Cr 14 AFNOR: Z 40 C 14 AISI: 420 ESR	C Si Mn Cr 0.40 0.40 0.30 13.00	max. 240 HB (≈ max. 800 N/mm <sup>2</sup> )	Reseda green	<b>Steel for through hardening</b> low corrosion, suitable for mirror polishing, electroslag remelted, high-alloy	Cavity plates and inserts for the processing of plastics, mainly for corrosive plastics
1.2085	DIN: X 33 CrS 16 AFNOR: Z 35 CD 17.5 AISI: ≈ 422+S	C Si Mn Cr S Ni 0.33 0.30 0.80 16.00 0.06 0.30	280–325 HB (≈ 950–1100 N/mm <sup>2</sup> )	Yellow green	<b>Tool steel</b> pre-hardened, corrosion resistant, good machinability, high-alloy	Plates for corrosion-resistant mould bases and die sets; moulds for processing corrosive plastics
1.2162	DIN: 21 MnCr 5 AFNOR: 20 MC 5 AISI: 5120	C Si Mn Cr 0.21 0.25 1.25 1.20	max. 210 HB (≈ max. 710 N/mm <sup>2</sup> )	Mint green	<b>Steel for case-hardening</b> alloyed	Cavity plates and machine parts
1.2210	DIN: 115 CrV 3 AFNOR: 100 C3 UNI: 107 CrV 3 KU AISI: L2	C Si Mn Cr V 0.18 0.25 0.30 0.70 0.50	max. 220 HB (≈ max. 750 N/mm <sup>2</sup> )	Bronze gold	<b>Cold-work steel</b> alloyed, wear resistant	Core pins; punches; small turned parts
1.2311	DIN: 40 CrMnMo 7 AFNOR: 40 CMD 8 UNI: 35 CrMo 8 KU AISI: P20	C Si Mn Cr Mo 0.40 0.40 1.50 1.90 0.20	280–325 HB (≈ 950–1100 N/mm <sup>2</sup> )	Pure white	<b>Tool steel</b> alloyed, hardened and tempered, ideal for nitriding, polishable	Cavity plates; inserts; high-strength machine parts
1.2312	DIN: 40 CrMnMoS 8-6 AFNOR: 40 CMD 8.S AISI: P20+S	C Si Mn Cr Mo S 0.40 0.40 1.50 1.90 1.20 0.06	280–325 HB (≈ 950–1100 N/mm <sup>2</sup> )	Traffic purple	<b>Tool steel</b> alloyed, hardened and tempered, ideal for nitriding, good machinability	Plates for mould bases and die sets with increased strength requirements
1.2316	DIN: X 38 CrMo 16 AFNOR: Z 35 CD 17 UNI: X 38 CrMo 16 KU AISI: ≈ 422	C Si Cr Mo 0.36 16.00 1.20	280–325 HB (≈ 950–1100 N/mm <sup>2</sup> )	Fluorescent red	<b>Tool steel</b> hardened and tempered, corrosion resistant, polishable, high-alloy	Moulds for processing corrosive plastics
1.2343	DIN: X 37 CrMoV 5-1 AFNOR: Z 38 CDV 5 UNI: X 37 CrMoV 5-1 KU AISI: H11	C Si Mn Cr Mo V 0.38 1.00 0.40 5.30 1.20 0.40	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Carmine red	<b>Hot-work steel</b> high-alloy	Cavity plates and inserts for plastic injection moulds
1.2343 ESR	DIN: X 37 CrMoV 5-1 AFNOR: Z 38 CDV 5 UNI: X 37 CrMoV 5-1 KU AISI: H11 ESR	C Si Mn Cr Mo V 0.38 1.00 0.40 5.30 1.20 0.40	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Light pink	<b>Hot-work steel</b> suitable for mirror polishing, electroslag remelted, high-alloy	Cavity plates and inserts for die casting (Al, Mg, Zn, etc.) and injection moulds
1.2344	DIN: X 40 CrMoV 5-1 AFNOR: Z 40 CDV 5 UNI: X 40 CrMoV 5-1 KU AISI: H13	C Si Cr Mo V 0.40 1.00 5.30 1.40 1.00	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Pastel turquoise	<b>Hot-work steel</b> high-temperature resistant, high-temperature wear resistant, excellent thermal conductivity, high-alloy	Standard material for hot-work tools; extrusion moulds; forging dies; tools for plastic processing
1.2344 ESR	DIN: X 40 CrMoV 5-1 AFNOR: Z 40 CDV 5 UNI: X 40 CrMoV 5-1 KU AISI: H13 ESR	C Si Cr Mo V 0.40 1.00 5.30 1.40 1.00	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Steel blue	<b>Hot-work steel</b> suitable for mirror polishing, electroslag remelted, high-alloy	Standard material for hot-work tools; extrusion moulds; forging dies; tools for plastic processing
1.2363	DIN: X 100 CrMoV 5 AFNOR: Z 100 CDV 5 UNI: X 100 CrMoV 5-1 KU AISI: A2	C Si Mn Cr Mo V 1.00 0.30 0.50 5.20 1.10 0.20	max. 240 HB (≈ max. 820 N/mm <sup>2</sup> )	Concrete grey	<b>Steel for through hardening</b> dimensional stability and high hardenability, wear resistant, cold-work steel, good machinability	Cavity plates and inserts as well as cutting punches, wear plates and cutting plates with high toughness requirements
1.2379	DIN: X 153 CrMoV 12 AFNOR: Z 160 CDV 12 AISI: ≈ D2	C Si Mn Cr Mo V 1.53 0.30 0.35 12.00 0.80 0.80	max. 255 HB (≈ max. 860 N/mm <sup>2</sup> )	Pastel orange	<b>Steel for through hardening</b> cold-work steel, wear resistant, high-alloy	Cavity plates and inserts as well as wear plates and cutting plates with high wear resistance
1.2714	DIN: 55 NiCrMoV 7 AFNOR: 55 NCDV 7 AISI: L6	C Cr Ni Mo V 0.56 1.10 0.50 1.70 0.30	max. 250 HB (≈ max. 850 N/mm <sup>2</sup> )	Pastel green	<b>Steel for through hardening</b> good high-temperature resistance and toughness	Extrusion dies; hot-forging tools; dies for processing tin, lead and zinc alloys
1.2714 HH	DIN: 55 NiCrMoV 7 AFNOR: 55 NCDV 7 AISI: L6	C Cr Ni Mo V 0.56 1.10 0.50 1.70 0.30	40–43 HRC (≈ 1250–1400 N/mm <sup>2</sup> )	Beige	<b>Steel for through hardening</b> hardened and tempered, good high-temperature resistance and toughness	Inserts, cores and slides for plastic moulds and dies
1.2738	DIN: 40 CrMnNiMo 8-6-4 AFNOR: 40 CMND 8 AISI: ≈ P20 + Ni	C Si Mn Cr Mo Ni 0.40 0.30 1.90 1.90 0.20 1.10	280–325 HB (≈ 950–1100 N/mm <sup>2</sup> )	Turquoise blue	<b>Tool steel</b> hardened and tempered, uniform strength even in plates and bars with larger dimensions, polishable and nitridable	Large cavity plates with deep cavities; bumpers; dashboards
1.2738 TSHH	DIN: special alloy	C Mn Cr Ni V 0.26 1.45 1.25 12.00 1.05 0.12	33–38 HRC (≈ 1050–1200 N/mm <sup>2</sup> )	Signal grey	<b>Steel for plastic moulds</b> modified, hardened and tempered, good polishability and excellent grainability, high thermal conductivity and wear resistance	Cavity plates without dimension restrictions, with deep cavities and high core load
1.2767	DIN: 45 NiCrMo 16 AFNOR: 45 NCD 16 UNI: 40 NiCrMoV 16 KU AISI: ≈ 6F7	C Si Mn Cr Mo Ni 0.45 0.25 0.40 1.35 0.25 4.00	max. 280 HB (≈ max. 950 N/mm <sup>2</sup> )	Jet black	<b>Steel for through hardening</b> alloy, polishable, high resistance to pressure and good flexural strength	High-performance cavity plates and inserts; cutting and bending inserts for high compressive loads
1.2842	DIN: 90 MnCrV 8 AFNOR: 90 MV 8 UNI: 90 MnVCr 8 KU AISI: ≈ O2	C Si Mn Cr V 0.90 0.20 2.00 0.40 0.10	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Clay brown	<b>Steel for through hardening</b> dimensional stability and high hardenability, wear resistant, cold-work steel, with very good machinability	Cavity plates and inserts exposed to abrasive stress; cutting punches; wear plates, cutting plates and guiding plates; guiding rails
1.3343 (HSS)	DIN: HS 6-5-2 C AFNOR: Z 85 WDCV 6 UNI: X 82 WMoV 6 5 AISI: M 2 reg. C	C Si Mn Cr V W 0.90 0.30 0.30 5.00 1.90 6.20	max. 269 HB (≈ max. 915 N/mm <sup>2</sup> )	Daffodil yellow	<b>High speed steel</b> very high resistance to adhesive and abrasive wear in combination with high toughness and compressive strength	Blocks for eroding, cutting and fine blanking punches; impact extrusion punches and dies; inserts with very high wear resistance
1.3344 PM	DIN: PM 6-5-3 AFNOR: X 130 WMoCrV 6-5-4-3 UNI: W 6 Mo 5 Cr 4 V 3 AISI: M 3-2 (PM)	C Si Mn Cr Mo V W 1.25 0.30 4.0 5.0 5.0 3.0 6.2	max. 265 HB (≈ max. 905 N/mm <sup>2</sup> )	Bronze silver	<b>Powder metallurgical steel</b> highest resistance to adhesive and abrasive wear in combination with optimal toughness, ideal for through hardening	Blocks for eroding, cutting punches and dies with particularly durable edges; inserts with highest wear resistance
1.7131	DIN: 16 MnCr 5 AFNOR: 16 MC 5 AISI: 5115	C Si Mn Cr 0.16 0.25 1.15 0.95	max. 186 HB (≈ max. 635 N/mm <sup>2</sup> )	Blue lilac	<b>Steel for case-hardening</b> alloy	Guiding elements, core inserts and machine parts
1.7225	DIN: 42 CrMo 4 AFNOR: 42 CD 4 UNI: 42 CrMo 4 AISI: 4140	C Si Mn Cr Mo 0.42 0.25 0.75 -0.035 1.10 0.22	max. 217 HB (≈ max. 740 N/mm <sup>2</sup> )	Night blue	<b>Steel for quenching and tempering</b> high strength and toughness, universally usable in jig and fixtures construction	Jigs and fixtures, base plates, axes, gear shafts, gear wheels
3.3547 (AW-5083)	DIN: AlMg 4.5 Mn EN: AW-5083 AFNOR: A-G4.5MC UNI: 7790	Si Fe Cu Mn Mg Zn Ti 0.40 0.40 0.10 0.70 4.40 0.25 0.15	68–75 HB (≈ 230–260 N/mm <sup>2</sup> ) ● min. 78 HB (≈ min. 270 N/mm <sup>2</sup> )	Yellow green	<b>Aluminium alloy</b>	Plates for mould bases as well as jigs and fixtures
3.4365 (AW-7075)	DIN: AlZnMgCu 1.5 EN: AW-7075 AFNOR: A-25GU UNI: 9007/2	Si Fe Cu Mn Mg Cr Zn Ti 0.40 0.50 1.60 0.30 2.40 0.23 5.60 0.20	max. 158 HB (≈ max. 540 N/mm <sup>2</sup> )	Turquoise blue	<b>Aluminium zinc alloy</b> high strength, hardened	Plates for mould bases and die sets with increased strength requirements
M V10 PM	AISI: A11	C Si Mn Cr Mo V 2.45 0.90 0.50 5.20 1.30 9.75	max. 280 HB (≈ max. 960 N/mm <sup>2</sup> )	Turquoise green	<b>Powder metallurgical steel</b> highest resistance to abrasive wear and excellent toughness, good machinability through a homogeneous microstructure	Blocks for eroding, dies and cutting punches with extreme requirements; fine cutting dies; pressing punches for sinter press tools
M W10 PM	EN: HS 10-2-5-8	C Cr Mo V W Co 1.60 4.80 2.00 5.00 10.50 8.00	max. 285 HB (≈ max. 970 N/mm <sup>2</sup> )	Claret violet	<b>Powder metallurgical steel</b> high resistance to adhesive wear and excellent toughness, very high working hardness and therefore highest compressive strength possible	Blocks for eroding, dies, cutting punches and cutting tools for extremely high requirements; fine cutting dies; embossing tools, cold solid forming
CF-H25S+	ISO: K20/K30 US Industry: C10/C13	WC Co 90.3 8.5	1680 HV10		<b>Carbide</b> very fine/fine grain grade with good edge stability despite high hardness	Cutting punches and dies, for abrasive materials and materials prone to welding
CF-H40S+	ISO: K40 US Industry: C11/C12	WC Co 86.6 11.8	1400 HV10		<b>Carbide</b> the universal carbide grade – the ideal compromise between hardness and fracture toughness with high edge stability	Blocks for eroding, cutting punches and dies with maximum wear resistance; active parts for stamping, embossing, bending and forming

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