



# Formable steel, hot dip galvanized

## Properties

### Material description

These steels are manufactured using the BOF process and are aluminium killed. The best formability properties are based on vacuum treatment, which will provide very low carbon and nitrogen contents. Furthermore, the remaining carbon and nitrogen are compounded by micro alloying with titanium and/or niobium.

### Mechanical properties

Steel grade	Yield strength R <sub>e</sub> <sup>1)</sup> MPa	Tensile strength R <sub>m</sub> MPa	Elongation A <sub>80</sub> %			Plastic strain ratio r <sub>90</sub> Minimum	Strain hardening exponent n <sub>90</sub> Minimum
			Minimum	Thickness mm			
			≤ 0.50	0.50-0.70	> 0.70		
DX51D	–	270 – 500	18	20	22	–	–
DX52D	140 – 300	270 – 420	22	24	26	–	–
DX53D	140 – 260	270 – 380	26	28	30	–	–
DX54D	120 – 220	260 – 350	32	34	36	1.6	0.18
DX56D	120 – 180	260 – 350	35	37	39	1.9 <sup>2)</sup>	0.21
DX57D <sup>3)</sup>	120 – 170	260 – 350	37	39	41	2.1 <sup>2)</sup>	0.22

1) If the yield point is not pronounced, the values apply to the 0.2% proof strength (R<sub>p0.2</sub>). If the yield point is pronounced, the values apply to the lower yield point (R<sub>eL</sub>).

2) For sheet thicknesses higher than 1.50 mm the r<sub>90</sub> value shall be reduced by 0.2 units.

3) Orders for this steel grade must be agreed on separately.

Testing is carried out transverse to the rolling direction.

### Typical values of mechanical properties

Steel grade	Yield strength R <sub>e</sub> <sup>1)</sup> MPa	Tensile strength R <sub>m</sub> MPa	Elongation A <sub>80</sub> %		Plastic strain ratio r <sub>90</sub> Minimum	Strain hardening exponent n <sub>90</sub> Minimum
			Minimum	Thickness mm		
Tin Smith Pro	180	330	39		-	-

Testing is carried out transverse to the rolling direction.

### Chemical composition

Steel grade	Content % maximum					
	C	Si	Mn	P	S	Ti
DX52D-DX57D	0.12	0.50	0.60	0.10	0.045	0.30