

For comments Only**BUREAU OF INDIAN STANDARDS**

*Draft* **AMENDMENT NO. 1**  
**TO**  
**IS 2062:2006 HOT ROLLED LOW, MEDIUM AND HIGH TENSILE**  
**STRUCTURAL STEEL (Sixth Revision)**

**ICS 77.140.01**

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**Last date for receipt of  
comments is 15 Nov. 2008**

(Clause 2 and Table 4) – Delete reference to 1731:1971 Dimensions for steel flats for structural and general engineering purposes (first revision). Include “IS 12779:1989 – Rolling and cutting tolerances for hot rolled parallel flange beams and column sections”.

(Clause 3) - Insert a new subclause as given below:

**“3.5 Accelerated Cooling** – It is a process of faster cooling of the product after finish rolling followed by air cooling to impart fine ferritic grain structure. This process ensures achieving specified mechanical properties including impact toughness in the rolled product

(Clause 5) - Substitute the following for the existing

“ There shall be 8 grades of steel as given in Table 1 and 2. For grades E250 to E450 there shall be 4 sub qualities (A, BR, B0 & C) and for grades E550 to E650 there shall be 2 sub qualities (A & BR).

Sub-qualities A, BR, B0, C indicate impact test and de-oxidation mode as follows:

<b>A</b>	Impact test not required, semi killed/killed
<b>BR</b>	Impact test optional; at room temperature if required, killed
<b>B0</b>	Impact test mandatory at 0 degree C, killed
<b>C</b>	Impact test mandatory at -20 degree C, killed “

**Table 1** - Substitute the following for the existing:

**Chemical Composition**  
*(Clauses 5, 8.1 and 8.2)*

Grade Designation	Quality	Ladle Analysis, Percent, Max					Carbon Equivalent (CE), Max	Method of Deoxidation
		C	Mn	S	P	Si		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
E 250	<b>A</b>	0.23	1.50	0.045	0.045	0.40	0.42	Semi killed/ killed
	<b>BR</b> <b>B0</b>	0.22	1.50	0.045	0.045	0.40	0.41	Killed
	<b>C</b>	0.20	1.50	0.040	0.040	0.40	0.39	Killed
E 300	<b>A</b>	0.20	1.30	0.045	0.045	0.45	0.40	Semi killed/ killed
	<b>BR</b> <b>B0</b> <b>C</b>							Killed
E 350	<b>A</b>	0.20	1.50	0.045	0.045	0.45	0.42	Semi killed/ killed
	<b>BR</b> <b>B0</b> <b>C</b>							Killed
E 410	<b>A</b>	0.20	1.60	0.045	0.045	0.45	0.46	Semi killed/ killed
	<b>BR</b> <b>B0</b> <b>C</b>							Killed
E 450	<b>A</b>	0.22	1.60	0.045	0.045	0.45	0.48	Semi killed/ killed
	<b>BR</b>							Killed
E 550	<b>A</b>	0.22	1.65	0.020	0.025	0.50	0.50	Semi killed/ killed
	<b>BR</b>							Killed

E 600	<b>A</b>	0.22	1.70	0.020	0.025	0.50	0.50	Semi killed/ killed
	<b>BR</b>							Killed
E 650	<b>A</b>	0.22	1.70	0.015	0.025	0.50	0.52	Semi killed/ killed
	<b>BR</b>							Killed

**NOTES**

- Carbon equivalent (CE) based on ladle analysis =  $C + \frac{Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$
- When the steel is killed by aluminium alone, the total aluminium content shall not be less than 0.02 percent. When the steel is killed by silicon alone, the silicon content shall not be less than 0.10 percent. When the steel is silicon-aluminium killed, the silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.
- Microalloying elements like Nb, V, Ti and B may be added singly or in combination. Total microalloying elements shall not be more than 0.25.
- New grades designation system based on yield stress has been adopted.
- Steels of qualities A, BR, B0 and C are generally suitable for welding processes. The weldability increases from quality A to C for grade designation E 250.
- Copper may be present between 0.20 to 0.35 percent as mutually agreed to between the purchaser and the manufacturer. The copper bearing quality shall be designated with a suffix Cu, for example E 250 Cu. In case of product analysis the copper content shall be between 0.17 and 0.38 percent.
- Nitrogen content of steel shall not exceed 0.012 percent which shall be ensured by the manufacturer by occasional check analysis.
- The steel if required may be treated with rare earth element for better formability.
- Lower limits for carbon equivalent and closer limits for other elements may be mutually agreed to between the purchaser and the manufacturer
- Alloying elements such as Cr, Ni, and Mo may be added singly or in combination and shall not be more than 0.50% for E 600 and 0.60% for E 650.
- Incidental element* - Elements not quoted in Table 1 and other than given in notes 3,6 & 10 shall not be intentionally added to steel without the agreement of the purchaser, other than for the purpose of finishing the heat. All reasonable precautions shall be taken to prevent the addition from scrap or other materials used in manufacture of such elements which affect the hardenability, mechanical properties and applicability.

**Table 2** - Substitute the following for the existing:

**Mechanical Properties**  
(Clause 5, 10.3 and 10.3.1)

Grade Designation	Quality	Tensile Strength $R_m$ Min MPa	Yield Stress $R_{eH}$ Min MPa			Percentage Elongation $A_1$ at Gauge Length, $L_0=5.65 \sqrt{S_0}$ Min	Internal Bend Diameter Min (See Note 2)		Charpy Impact Test (See Note 3 & 4)	
			<20	20-40	>40		≤25	>25	Temp Deg C	Min J
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
E 250	<b>A</b>	410	250	240	230	23	2t	3t	-	-
	<b>BR</b>								RT	27
	<b>B0</b>								0	27
	<b>C</b>								(-) 20	27
E 300	<b>A</b>	440	300	290	280	22	2t	-	-	-
	<b>BR</b>								RT	27
	<b>B0</b>								0	27
	<b>C</b>								(-) 20	27
E 350	<b>A</b>	490	350	330	320	22	2t	-	-	-
	<b>BR</b>								RT	27
	<b>B0</b>								0	27
	<b>C</b>								(-) 20	27
E 410	<b>A</b>	540	410	390	380	20	2t	-	-	-
	<b>BR</b>								RT	25
	<b>B0</b>								0	25
	<b>C</b>								(-) 20	25
E 450	<b>A</b>	570	450	430	420	20	2.5t	-	-	-
	<b>BR</b>								RT	20
	<b>B0</b>								0	20
	<b>C</b>								(-) 20	20

E 550	A	650	550	530	520	12	3.0t	-	-	-
	BR								RT	15
E 600	A	730	600	580	570	12	3.5t	-	-	-
	BR								RT	15
E 650	A	780	650	630	620	12	4.0t	-	-	-
	BR								RT	15

NOTES

1

MPa = 1N/mm<sup>2</sup> = 1MN/m<sup>2</sup> = 0.102 kgf/mm<sup>2</sup> = 144.4 psi

2

Bend test not required for thickness > 25 mm for grades E300 to E650. ‘t’ is the thickness of the test piece.

3

RT – Room Temperature = 25±2 Deg C

4

For BR grades impact test is optional; at room temperature if required.

- 6** Insert the word “accelerated cooling” after “normalizing rolling/controlled rolling”.
- 7.3** Substitute the following for the existing:  
Welding as mentioned in 7.2.1 is not permissible for grade designation E 250 C, E300 to E650
- 9.1** Insert the following note below the existing clause:  
NOTE - However, in case of the plates beyond 12 mm in thickness, produced from cutting of HR coil, the sample for tensile testing shall be taken only in transverse direction.
- 12.1** First sentence, delete “or subject to mutual agreement between the Purchaser and manufacturer/supplier”
- 12.2** Delete last sentence.
- 16** Substitute the following for the existing:  
  
‘Unless otherwise agreed to between the purchaser and the manufacturer, the rolling and cutting tolerances for steel products conforming to this standard shall be those specified in IS 1852 except for parallel flange beams and columns covered by IS 12778 for which the tolerances shall be as per IS 12779. sections. Other tolerances may be followed, within the total tolerance range as specified in IS 1852/12779 as applicable.’
- 17** Substitute the following for the existing:  
  
‘If a test does not give the specified results, retest / sorting / retreatment shall be carried out as per the relevant clauses of IS 8910’