

RAW MATERIALS / FERROUS

FNHA-2-A-301.00

HOT-ROLLED STRUCTURAL A36 FLAT**1. SCOPE**

1.1 This standard covers carbon steel flat bars of structural quality for use in riveted, bolted, or welded construction for general structural purposes.

1.2 When the steel is used in welded construction, welding procedure shall be suitable for the steel and the intended service.

1.3 Supplemental requirements are provided where improved notch toughness is important. These shall apply only when specified by the purchaser in the order.

2. DRAWING SPECIFICATION

2.1 Versatile only:
Material Codes 201, 210, 230, 240, & 250.

3.2 NH only:
HR Flat ASTM A36 (Preferred) or
HR Flat ASTM A36 P & O.

3. RELATED SPECIFICATION**3.1 REFERENCE STANDARDS**

ASTM A36 - Standard Specification for Structural Steel.

ASTM A6 - General Requirements for Rolled Steel Plates, Shapes, and Bars for Structural Use.

86050124 (FNHA-2-A-027.00) General Requirements for Carbon and Alloy Steel Bars.

3.2 This standard replaces the following company standard:

Versatile

MS - 607

4. REQUIREMENTS

4.1 CHEMICAL REQUIREMENTS: The heat analysis shall conform to requirements in Table 1.

4.2 The steel shall conform on product analysis to the requirements prescribed in ASTM A36 and ASTM A6 Standards.

4.3 MECHANICAL REQUIREMENTS

4.3.1 The material as represented by the test specimen, shall conform to the requirements of the tensile properties prescribed in Table 2.

4.3.2 For material under 5/16 in. (8 mm) in thickness or diameter, a deduction from the percentage of elongation in 8 in. (203 mm), specified in Table 2, of 1.25% shall be made for each decrease of 1/32 in. (0.8 mm) of the specified thickness or diameter below 5/16 in. (8 mm).

4.3.3 The bend test specimens shall withstand cold bending through 180 degrees without cracking on the outside of the bent portion, to an inside diameter which shall have a relation to the thickness of the specimen as prescribed in Table 3.

4.4 SUBSTITUTIONS: AISI 1015, 1018 or 1020 may be substituted for ASTM A36 provided mechanical requirements of A36 are met by the substitute material. Mechanical property certification must be available on request.

					NAME	STD ASTM A36 HR FL	
ALL	H	TH	112782	12-98	 NEW HOLLAND	ENGINEERING SPECIFICATION	
ALL	G	RLF	110229	JUL 97			
ALL	F	TH	109489	970409			
ALL	E	TH	108931	970107			
LL	D	RLF	107038	951018			
LL	C	RE	104739	931015	THE INFORMATION HEREON IS THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF NEW HOLLAND NORTH AMERICA, INC. AND/OR NEW HOLLAND CANADA, LTD. ANY USE, EXCEPT THAT FOR WHICH IT MAY BE LOANED, IS PROHIBITED.	FRAME 1	OF 2
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5. GENERAL REQUIREMENTS FOR DELIVERY

5.1 Refer to FNHA Engineering Standard 86050092 (FNHA 2-A-001.00)

5.2 For Tolerances see FNHA Engineering Standard 86050124 (FNHA 2-A-027.00) General Requirements for Carbon and Alloy Steel Bars, Hot-rolled and Cold Finished.

TABLE 1 CHEMICAL REQUIREMENTS

Product Shapes	Plates						Bars			
	ALL	To .75	Over .75 To 1.75	Over 1.75 To 2.5	Over 2.5 To 4	Over 4	To .75	Over .75 To 1.75	Over 1.75 To 4	Over 4
Thickness (In.)										
Carbon, max %	.26	.25	.25	.26	.27	.29	.26	.27	.28	.29
Manganese %			.80 - 1.20	.80 - 1.20	.85 - 1.20	.85 - 1.20		.60 - .90	.60 - .90	.60 - .90
Phosphorus max %	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
sulfur, max %	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
Silicon			.15 - .30	.15 - .30	.15 - .30					
Copper, max % *	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20

* When copper steel is specified

TABLE 2 TENSILE REQUIREMENTS

Plates, Shapes, and Bars	Tensile Strength PSI (MPa)	58,000 - 80,000 (400 - 500)
	Yield Point, PSI (MPa)	36,000 (250)
Plates and Bars	Elongation in 8 in. (200mm), min %	20
	Elongation in 2 in. (50mm), min %	23
Shapes	Elongation in 8 in. (200mm), min %	20
	Elongation in 2 in. (50mm), min %	21

TABLE 3 BEND TEST REQUIREMENTS

Thickness of Material, in. (mm)	Ratio of Bend Diameter to Thickness of Specimen for Plates, Shapes, and Bars*
3/4 (19) and Under	1/2
Over 3/4 To 1 (19 - 25)	1
Over 1 To 1 1/2 (25 - 38)	1 1/2
Over 1 1/2 To 2 (38 - 51)	2 1/2
Over 2 (51)	3

* These rates apply to the bending performance of a test specimen only. This specimen is always taken in the longitudinal direction and usually has some edge preparation. Where plates are to be bent in a fabricating operation, more liberal bend ratios must be used, particularly if the bend axis is in the unfavorable (longitudinal) direction.

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