

ROPS Quality Steel, Hot Rolled Sheet**1. SCOPE**

1.1 This standard is intended to cover ROPS-quality hot-rolled steel sheet and strip used in FNHA operations.

1.2 ROPS steel has the following physical characteristics: Good notch toughness material meeting minimum Charpy v-notch impact energy requirements as shown in Table 3. This steel shall meet all requirements to be termed ROPS material as set by CSA standard B352-M1980 and therefore permit static and crush test alternative, allowing testing to be performed at ambient temperature.

2. DESIGNATION

HR SHEET OR STRIP P&O ROPS

3. RELATED SPECIFICATIONS**3.1 REFERENCE STANDARDS**

CSA-G40.21M—Grade 350, Type WT (metric)
 CSA-G40.21—Grade 50, Type WT (imperial)
 equivalent ASTM A572 grade 50; or ASTM A715, grade 50; or ASTM A570 grade 50 for sheets up to 6.0 mm (0.229 inch) thick
 86050115 (FNHA 2-A-026.00)—General Requirements for Carbon and High Strength Low-Alloy Hot-Rolled Sheet, Hot-Rolled Strip and Cold-Rolled Sheet Steel

3.2 This standard replaces the following company standard:

Versatile

MS-644

4. REQUIREMENTS**4.1 CHEMICAL REQUIREMENTS****Table 1**

Elements	Percent Analysis
Carbon, max	0.22
Manganese, max	1.65
Phosphorus, max	0.020
Sulfur, max	0.025

These steels may also contain one or more of the following elements: vanadium, titanium, or columbium.

4.2 MECHANICAL REQUIREMENTS**Table 2**

Tensile Strength, min. psi (MPa)	70,000 (480)
Yield Point, min. psi (MPa)	50,000 (350)
Elongation in 2 in(50 mm), Hot Rolled, min. %:	22

					NAME	STD ROPS HR SH		
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4.3 CHARPY IMPACT REQUIREMENTS

All Charpy impact testing shall be conducted at -30 degrees C (-20 degrees F). An impact test shall consist of three specimens taken from a single test coupon or test location. The average energy value of the three shall comply with the specified minimum with no more than one value below the specified minimum as listed in Table 3. One Charpy impact test shall be made for each heat of steel. Unless otherwise specified, longitudinal test specimens shall be used with the notch perpendicular to the surface of the specimen.

Table 3

Specimen size, mm	Absorbed Energy, joules
10 x 5 *	7.5
10 x 4	7.0
10 x 3.3	6.0
10 x 3	6.0
10 x 2.5 *	5.5

* Indicates preferred specimen size

	NAME				PART NUMBER	
	STD ROPS HR SH				86528507	
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