

Data Sheet: A7.2

Liquid petroleum gas cylinder steel

Hot Rolled Coil for Welded Liquid Petroleum Gas Cylinders

General description

Mittal Steel South Africa supplies a steel specification suitable for the manufacture of two-piece and three-piece welded liquid petroleum gas (LPG) cylinders, namely:

- LPG 275 - a standard carbon manganese steel

This product was developed for moderate stretching and drawing operations. The high elongation of LPG 275 (28% minimum) allows the material to be formed easily without failure. The low carbon content contributes to the ease of fabrication, which includes excellent weldability.

Steel making

The steel is aluminium treated to ensure a fine grain structure and made by the continuous casting process. This produces steel that is eminently suitable for deep drawing applications, in particular for cylinders made to SABS 219-1978: 'The design and manufacture of welded steel cylinders for low pressure service'.

In addition to LPG 275, Mittal Steel South Africa also produces steel for the manufacturing of gas cylinders in accordance with certain international specifications. The following are available on enquiry:

- BS 5045 Part 2 Type B
- NF A 36-211 BS1
- NF A 36-211 BS2
- JIS G3116 SG 255

Chemical composition

Table 1. Chemical composition specification (ladle analysis, percent)

Grade	C Max	Mn	Si max	P max	S max	Al
LPG 275	0,18	0,40 - 1,20	0,30	0,030	0,030	0,01 - 0,08

In order to assist users in determining fabrication parameters, the typical chemical compositions used to achieve the desired mechanical properties are given in Table 2:

Table 2. Typical chemical composition (ladle analysis, percent)

Grade	C	Mn	Si	P	S	Al
LPG 275	0,16	1,00	0,03	0,015	0,005	0,040

For further information, contact:

Mittal Steel South Africa Limited, PO Box 2, Vanderbijlpark 1900. Toll free number 0800 005043, Fax (016) 889-0070
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Care has been taken to ensure that the information in this data sheet is accurate. Mittal Steel South Africa Limited does not, however, assume responsibility for any inaccuracies or misinterpretations of this data. We are continuously engaged in product development and revised data sheets will be issued from time to time. Please ensure that you have the most recent issue. Effective date: October 2005

Mechanical properties

Although the steel is usually supplied in the as rolled condition, the tensile test is carried out on a test piece normalised at 900°C with soaking time of two minutes per millimetre thickness, after which it is allowed to cool in still air.

Because the cooling conditions that exist in a completed cylinder during the normalising treatment are different from those in a tensile test piece, the tensile values obtained for a test piece cut from a completed cylinder may differ from those given on the test certificate and users must allow for this variation when specifying values which must be submitted to standards authorities.

Table 3. Mechanical properties

Grade	Minimum yield strength (MPa)	Tensile ¹ strength (MPa)	Maximum YS/TS ratio	Minimum elongation ² (%)	Mandrel diameter For 180° bend test ³
					For thickness t $t \leq 6 \text{ mm}^4$
LPG 275	275	400 - 490	-	28	1t

Notes:

1. Tensile test to EN 10 002 Part 1 (1990).
2. Gauge length 50 mm.
3. The sample test pieces specimens will be free of cracks on the outside of the bend. The test is carried out in accordance with BS1639.

In order to assist users in determining fabrication parameters, the typical mechanical properties obtained on the normalised test pieces for 2,2 mm thick material are given in the table below:

Table 4. Typical mechanical properties for 2,5 mm thick material

Grade	Yield strength (MPa)	Tensile strength ¹ (MPa)	Elongation ² (%)
LPG 275	340	460	30

Notes:

1. Tensile test to EN 10 002 Part 1 (1990).
2. Gauge length 50 mm.

Dimensions

This LPG grade of steel is available in the dimensions indicated in the data sheet: Hot Strip Mill Product Dimensions (file reference A1.1).

Dimensional tolerances

Refer to the data sheet: Hot Strip Mill Product Tolerances (file reference A1.2).

Certification

All material described in this data sheet is supplied with test and analysis certificates.

Supply conditions

All material described in this data sheet is supplied in terms of Price List 121 and Mittal Steel South Africa's General Conditions of Sale.

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