

## SPECIFICATIONS

Commercial

ISO 15156

It is originally a US standard intended to assess the suitability of materials for oilfield equipment where sulphide (sulphide) stress corrosion cracking may be a risk in hydrogen sulphide (sour) environments. However, the world standards body ISO has issued it under its own "brand". The latest edition includes technical corrigenda from 2005. Discussions about the standard can be found on the NACE website.

The standard specifies the types of corrosion resistant materials including stainless steels that can be used in specific oilfield environments and places limits on the hardness of the material. This applies both to parent and weld material. The maximum hardness is usually defined in terms of the Rockwell 'C' scale.

No conversion to other hardness scales is given in MR 0175 which presents one problem as softened stainless steels hardnesses are measured using either the Rockwell 'B', Vickers or Brinell scales.

Approximate conversions are available.

Details of the requirements of NACE MR0175 / ISO 15156 can be found on the following page.

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## REVISION HISTORY

Datasheet Updated	14 November 2018
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## DISCLAIMER

This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

Please note that the 'Datasheet Update' date shown above is no guarantee of accuracy or whether the datasheet is up to date.

The information provided in this datasheet has been drawn from various recognised sources, including EN Standards, recognised industry references (printed & online) and manufacturers' data. No guarantee is given that the information is from the latest issue of those sources or about the accuracy of those sources.

Material supplied by the Company may vary significantly from this data, but will conform to all relevant and applicable standards.

As the products detailed may be used for a wide variety of purposes and as the Company has no control over their use; the Company specifically excludes all conditions or warranties expressed or implied by statute or otherwise as to dimensions, properties and/or fitness for any particular purpose, whether expressed or implied.

Advice given by the Company to any third party is given for that party's assistance only and without liability on the part of the Company. All transactions are subject to the Company's current Conditions of Sale. The extent of the Company's liabilities to any customer is clearly set out in those Conditions; a copy of which is available on request.

## NACE MR 0175/ISO 15156 for Corrosion Resistant Alloys for Sulphide Service

NACE MR 0175/ISO 15156 is a Materials Standard issued by the National Association of Corrosion Engineers. It is originally a US standard intended to assess the suitability of materials for oilfield equipment where sulphide (sulphide) stress corrosion cracking may be a risk in hydrogen sulphide (sour) environments. However, the world standards body ISO has issued it under its own "brand". The latest edition includes technical corrigenda from 2005. Discussions about the standard can be found on the [NACE website](#).

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**Summary of MR 0175 Requirements:** A wide range of materials is covered by the standard including most types (families) of stainless steels. The table below shows some of these grades. However, this summary is intended to only give a general idea of this complex standard and is not a substitute for the original document.

Steel Type	Grades Included	Comments
Ferritic	405,430, 409, 434, 436, 442, 444, 445, 446, 447, 448	Hardness up to 22 HRC
Martensitic	410, 420	Hardness up to 22 HRC
Martensitic	F6NM	Hardness up to 23 HRC
Martensitic	S41425	Hardness up to 28 HRC
Austenitic	201, 202, 302, 304, 304L, 305, 309, 310, 316, 316L, 317, 321, 347, S31254(254SMO), N08904(904L), N08926(1925hMo)	Solution annealed, no cold work to enhance properties, hardness up to 22 HRC
Austenitic	S20910	Hardness up to 35 HRC
Duplex	S31803 (1.4462), S32520 (UR 52N+), S32750 (2507), S32760 (Zeron 100), S32550 (Ferralium 255)	PREN $\geq$ 30 solution annealed condition, ferrite content 35% to 65%, or 30 to 70% in welds. Note that the general restriction of 28 HRC in previous editions is not found in this latest edition of the standard. There is a specific restriction on HIP'd S31803 to 25HRC. For some applications cold worked material is allowed up to 36HRC
Precipitation Hardening	17-4 PH	33 HRC Age hardening at 620 deg C
Precipitation Hardening	S45000	31 HRC Age hardening at 620 deg C
Precipitation Hardening	S66286	35 HRC

Free machining grades such as the 303 and 416 types are excluded from of NACE MR 0175/ISO 15156

**Help on Materials Selection for Sour Gas Service:** The selection of the correct corrosion resistant alloy for a specific set of conditions is quite a complex subject. There are a number of consultancies which specialise in this work. Typical of these is [Intetech](#) who have developed [Electronic Corrosion Engineer](#) software which guides the user to the correct alloy.