

A guide to understanding Dual NACE in API 610 11th edition

technical bulletin

The term “Dual NACE” has found its way into some specifications, however it is not a formal term with respect to API 610, and in fact, depending on what context it applies, is often used to apply to two different situations:

- 1) To convey that the material should be certified according to NACE and ISO standards.
- 2) To convey that the material should be certified to work in upstream and downstream applications.

As such, the term “Dual NACE” is best avoided altogether, but if it is used, the following explains both contexts and what the term is attempting to imply.

Usage I: NACE and ISO certification

Historically, prior to 2003, there were two standards for material selection for API 610 upstream applications, NACE MR0175 and ISO 15156. Both standards were slightly different and so customers would chose to specify one or the other, or indeed that the material should be certified under both standards – hence the terminology of “Dual NACE” that came into use in some circles.

In 2003 the MR0175 and ISO 15156 standards were aligned as technically identical documents and the standard ANSI/NACE MR0175/ISO 15156-2003 was created. In 2009 a second edition was published:

ANSI/NACE MR0175/ISO 15156-2009 “Petroleum and natural gas industries - Materials for use in H₂S-containing environments in oil and gas production.”

This is also sometimes referred to by its ISO only standard – i.e. ISO 15156-2009 but is identical to the above.

Figure I below shows how these standards evolved and merged.

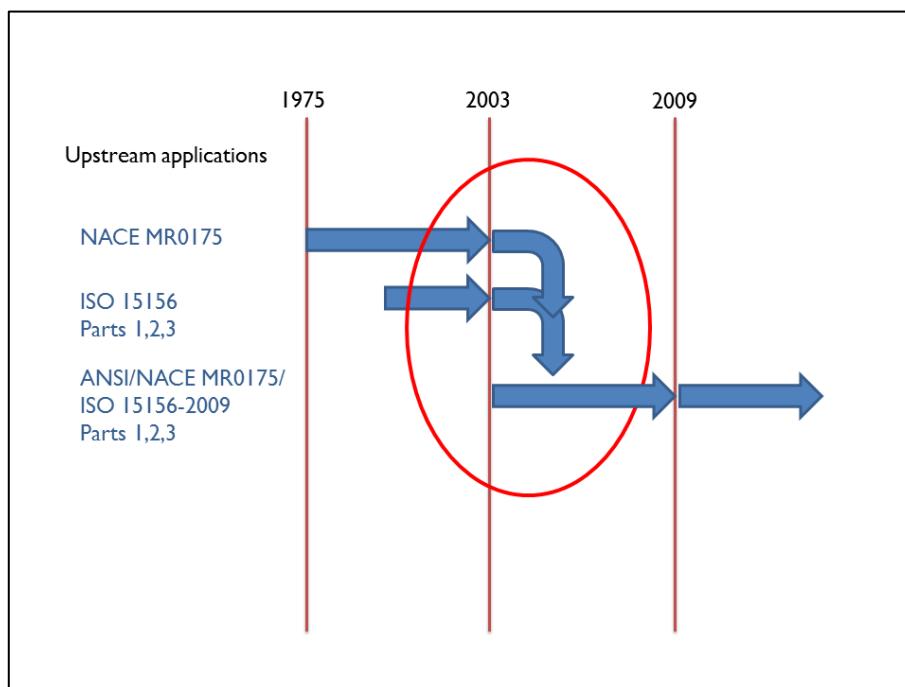


Figure I

All materials supplied today should be specified to the new ANSI/NACE MR0175/ISO 15156-2009 standard. Should a customer request either NACE MR0175 or ISO 15156 without a specific date then the convention is to use the latest standard and so material conforming to ANSI/NACE MR0175/ISO 15156-2009 can be deemed as being compliant.

However, if a customer specifies material to e.g. NACE MR0175-**2002** or ISO 15156-**2001** then these are **not** the same as the new ANSI/NACE MR0175/ISO 15156-2009 standard and so any such request should be queried to see if materials conforming to ANSI/NACE MR0175/ISO 15156-2009 can be used or not.

In addition, bulk components (such as flanges or pipes) that have been in storage for some time may have been manufactured to e.g. NACE MR0175-2002 and/or the ISO 15156-2001 or older standards, so again care must be taken when ordering from suppliers as these parts may not be certified to the latest standard, all-be-it they may be perfectly fit for purpose.

Usage 2: Upstream and downstream applications

With the publication of the combined ANSI/NACE MR0175/ISO 15156 standard in 2003 it moved even further away from the requirements of downstream applications and so a new standard was developed to specifically address the downstream applications. This was eventually released in 2007 as NACE MR0103 "Materials Resistant to Sulphide Stress Cracking in Corrosive Petroleum Refining Environments" and re-issued in 2010.

Figure 2 below shows how both the ANSI/NACE MR0175/ISO 15156 and NACE MR0103 standards evolved.

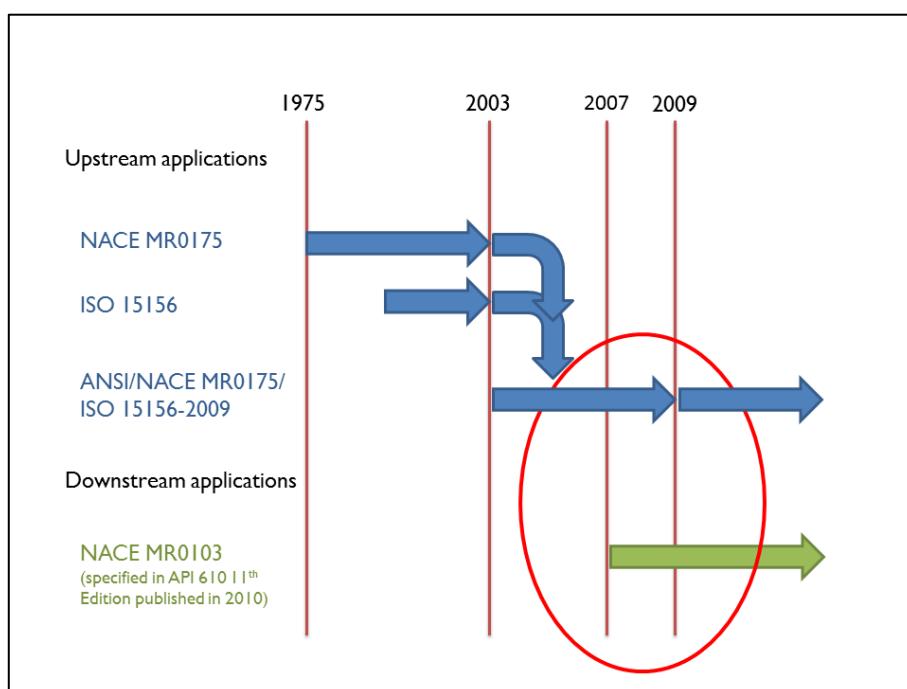


Figure 2

API 610 prior to 11th edition only made reference to materials for **upstream** applications i.e. **NACE MR0175 and ISO 15156** (as above). However, API 610 11th edition finally incorporated **downstream** applications with reference to **NACE MR0103**.

In some specifications the term “Dual NACE” has been used to refer to a material that can be used for both **upstream** and **downstream** applications. Although historically **NACE MR0175** has been used in downstream applications, with the introduction of **NACE MR0103** the use of the term “Dual NACE” should now be avoided and if seen queried.

So, in summary, materials used in upstream applications **must** be specified to **ANSI/NACE MR0175/ISO 15156-2009** in order to be resistant to H₂S environments. Materials used in **downstream** applications **should** be specified to **NACE MR0103** which is resistant to sulphide stress cracking in corrosive petroleum refining applications.

Responsibilities for materials specification under API 610 11th edition

Under API 610 11th edition it is the responsibility of the **equipment user** to select and specify a suitable material for the environment and specify the metallurgical requirements/standards that should apply. As such, the equipment user should specify **ANSI/NACE MR0175/ISO 15156-2009** for **upstream** equipment and **NACE MR0103** for **downstream** along with any other requirements such as annealing, hardness, welding and any further testing.

It is the responsibility of the **equipment supplier** (i.e. Amarinth) to ensure the metallurgical requirements are met which includes any material specification issued with the contract.

Conclusion

In conclusion, if “Dual NACE” is seen on a datasheet it is always wise to query what is meant by this because it could be interpreted as:

- Dual certification of the material to ISO15156 **and** NACE MR0175
or
- Dual certification of the material to NACE MR0175 **and** NACE MR0103

In addition, once it has been determined which of these is meant, it must also be established which release of the relevant standard applies.