Design and Construction of Large, Welded, Low-pressure Storage Tanks

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SECTION 1—SCOPE

1.1 General

The API Downstream Segment has prepared this standard to cover large, field-assembled storage tanks of the type described in 1.2 that contain petroleum intermediates (gases or vapors) and finished products, as well as other liquid products commonly handled and stored by the various branches of the industry.

The rules presented in this standard cannot cover all details of design and construction because of the variety of tank sizes and shapes that may be constructed. Where complete rules for a specific design are not given, the intent is for the manufacturer—subject to the approval of the purchaser's authorized representative—to provide design and construction details that are as safe as those which would otherwise be provided by this standard.

The manufacturer of a low-pressure storage tank that will bear the API 620 nameplate shall ensure that the tank is constructed in accordance with the requirements of this standard.

The rules presented in this standard are further intended to ensure that the application of the nameplate shall be subject to the approval of a qualified inspector who has made the checks and inspections that are prescribed for the design, materials, fabrication, and testing of the completed tank.

1.2 Coverage

1.2.1 This standard covers the design and construction of large, welded, low-pressure carbon steel above ground storage tanks (including flat-bottom tanks) that have a single vertical axis of revolution. This standard does not cover design procedures for tanks that have walls shaped in such a way that the walls cannot be generated in their entirety by the rotation of a suitable contour around a single vertical axis of revolution.

1.2.2 The tanks described in this standard are designed for metal temperatures not greater than 250 °F and with pressures in their gas or vapor spaces not more than 15 lbf/in.^{2} gauge.

1.2.3 The basic rules in this standard provide for installation in areas where the lowest recorded 1-day mean atmospheric temperature is –70 °F or warmer [1] and the designer will additionally have the availability to use the provisions of 4.2.2 low-stress/low-temperature design down to as cold as –155 °F. Annex S covers stainless steel low-pressure storage tanks in ambient temperature service in all areas, without limit on low temperatures. Annex R covers low-pressure storage tanks for refrigerated products at temperatures from +40 °F to –60 °F. Annex Q covers low-pressure storage tanks for liquefied gases at temperatures not lower than –325 °F.

1.2.4 The rules in this standard are applicable to tanks that are intended to (a) hold or store liquids with gases or vapors above their surface or (b) hold or store gases or vapors alone. These rules do not apply to lift-type gas holders.

1.2.5 Although the rules in this standard do not cover horizontal tanks, they are not intended to preclude the application of appropriate portions to the design and construction of horizontal tanks designed in accordance with

[1] The basic rules in this standard were originally written for use within the contiguous 48 United States of America, where the coldest recorded low 1-day mean atmospheric temperature is approximately –50 °F, which would result in a design metal temperature of –35 °F (–50 °F + 15 °F = –35 °F) when using the +15 °F addition per 4.1.5.2. Thus, Table 4-1 shown in the 2020 or later editions/addenda of API 620 have provided allowances for design metal temperatures colder than the previous minimum value of –35 °F.