STANDARDS UPDATE NOTICE (SUN)
ISSUED: February 18, 2022

STANDARD INFORMATION

Standard: ANSI NGV 4.8
Standard ID: Natural Gas Vehicle Fueling Station Reciprocating Compressor Guidelines [ANSI NGV 4.8:2021]
Previous Standard ID: Natural Gas Vehicle Fueling Station Reciprocating Compressor Guidelines (R2016) [ANSI NGV 4.8:2012]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **August 31, 2023**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn.

Overview of Changes:

- Process tubing requirements have been included
- Powder coating parts have been included
- Updated marking material requirements allowing pressure sensitive label

Specific details of new/revised requirements are found in table below.

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are <u>underlined</u> and deletions are shown ~~lined out~~ below.
4	Info	**Applications**
4.2		**Packager's representation** The packager shall indicate the following parameters within the operations manual: The packager shall warrant that the equipment meets the manufacturer's requirements or assume the responsibility as the manufacturer. <u>The packager's operation and maintenance manual shall be provided electronically or hardcopy with the package.</u>
4.9		**Torsional vibration analysis (see Annex B)** The compressor packager shall assume responsibility for a torsionally sound system <u>and provide a torsional vibration analysis when requested.</u>
4.10		***New clause added;*** **Pulsation study** The compressor packager shall assume responsibility that there are no adverse pulsations in the compressor piping system and provide a pulsation study when requested.
5	Info	**Compressor package**
5.1		The compressor package shall be designed for use with pipeline quality dry natural gas as typically specified by natural gas transmission and distribution utilities for the pressures and temperatures to which it could be subjected under specified operating conditions. Renewable natural gas (RNG) is considered to be pipeline quality <u>dry natural gas when it meets the same specifications.</u> <u>Current compressor types covered by this Standard include, but are not limited to, reciprocating compressors, integrated combustion engines and compressor packages, and hydraulic intensifier compressors.</u>
5.4		**Maximum allowable discharge temperature (see Annex B)** The compressor shall be provided with sufficient compression stages and interstage cooling to limit <u>the actual discharge temperature of each stage to the manufacturer's design maximum, unless a lower temperature is otherwise</u>

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		specified. This limit shall hold for all specified operating and load conditions. When specified, the compressor packager shall provide both the estimated actual and the calculated adiabatic discharge temperature rise.
5.11	Info	**Distance pieces**
5.11.1		**Design** Where applicable, if distance pieces are provided, they shall conform to ~~Types "1," "2," or "3" (see diagrams) and shall be of manufacturer's standard design.~~ the manufacturer's published specification.
5.12		***New section added;*** **Crankcase (frame)**
5.12.1		**Atmospheric frames** Compressor designs with atmospheric frames (crosshead type) shall incorporate a vent designed to prevent the ingress of water or insects.
5.12.2		**Pressurized frames** Compressor designs with pressurized frames (trunk type) shall have frames designed for the maximum expected pressure and be equipped with pressure relief valves and pressure switches.
7	Info	**Prime mover**
7.2	Info	**Natural gas engines**
7.2.5	Info	**Air intake system (see Annex B)**
7.2.5.1		**Air filter** The engine manufacturer's standard dry-type air filter, suitable for outdoor service, shall be provided. Unless adequately ventilated, air shall not be taken from inside enclosed buildings or package enclosure. The air filter shall be provided per the manufacturer's recommendation.
7.2.5.2		**Minimum design requirements** The following features shall be considered in the design of an air intake system: a) piping and supports for remote mounted air filters shall meet engine manufacturer's requirements. Remote mounted air filters shall have internal surface corrosion protection of inlet piping; b) remote mounted air filters shall be placed so that ground dust or snow cannot clog the filter; c) all ducting, including air cleaner-to-manifold connections, shall be air-tight to avoid the intake of unfiltered air;

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		d) restricted inlets, sharp or numerous bends, and undersized piping shall be avoided. Maximum pressure drop shall not exceed engine manufacturer's recommendation; e) all materials used for air intake system shall meet engine manufacturer's requirements; and f) air filters which are integrated with the compressor shall meet engine manufacturer's requirements.
7.2.6	Info	**Exhaust system**
		New clause added; **Exhaust system requirements**
7.2.6.1		The design and installation of the exhaust system shall meet the engine manufacturer's requirements. The engine may be equipped with optional features such as noise attenuating devices or spark arresters.
7.2.8	Info	**Engine emissions**
		New clause added; **Engine emission requirements**
7.2.8.1		If a catalytic converter or other external device is specified, it shall meet a specified air emissions requirement. The rated horsepower quoted shall reflect the effects, if any, of the additional back- pressure or heat loads placed on the driver by the device. Any special operational considerations, fuel composition, air-fuel ratio or lubrication specifications shall be clearly stated in the packager's quotation.
		New clause added; **Guards**
7.4		A moving part or high-pressure discharge opening that can cause risk of injury to persons shall be enclosed, guarded, located, or otherwise arranged to reduce the likelihood of unintentional contact, and such a part shall not be contacted by the articulated probe as shown in UL 1450 and have guards made of non-sparking material.
10	Info	**Piping, tubing, and appurtenances**
10.2	Info	**Gas piping (see Annex B)**
		New clause added;
10.2.7		**Flanged joints** Flanges shall meet the requirements of ASME B31.3.

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10.5		***New section added;*** **Process gas tubing requirements**
10.5.1		**Tubing material requirements** Tubing shall be ASME SA213 or ASTM 269 seamless, cold drawn stainless steel.
10.5.2		**Tubing diameter**
10.5.2.1		**General** Tubing used for interstage flow within the compressor package and at final discharge shall be of appropriate diameter and wall thickness for the application.
10.5.2.2		**Operating pressure requirements** Fittings and tubing shall be rated for system operating pressure of the location of the fitting or tubing.
10.5.3		**Tube fitting parts from different manufacturers** Tube fitting parts from different manufacturers shall not be interchanged or mixed.
10.5.4		**Flared fittings** Flared fittings shall not be allowed.
10.7		**Filters, separators, and pulsation bottles** Filters and separators shall be sized for the maximum compressor gas throughput and minimize liquid carryover into downstream components and vehicles in compliance with SAE J1616. The body design pressure shall not be less than the MAWP of the location at which it is installed. A drain valve shall be provided where applicable. Pulsation bottles shall be sized to conform to the manufacturer's design.
10.9	Info	**Relief valves (see Annex B)**
10.9.4		**Venting** Relief valves shall vent in the following manner: a) relief valves shall be piped to the perimeter of the compressor package; b) vent lines shall be terminated in accordance with NFPA 52 or CSA B108; c) relief valve vent lines may use a common header provided that the back pressure from the activation of one valve cannot prevent the operation of any other valve; and d) pressure relief valve venting systems shall be designed to protect against the elements.

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		Atmospheric vents shall have weep holes or a drain point(s) at the lowest point near the relief valve header and shall discharge at a safe height above the package and away from the engine air intake. A suitable termination of the vent stack shall be used to prevent blockage.
10.10	Info	**Captive recovery system**
10.10.2		**Recovery pressure vessel** The pressure vessel shall be sized to prevent overpressurizing the pressure vessel ~~under normal operating conditions.~~ <u>with all gas released from two shutdowns with no draw down or recirculation between shutdowns, without relief valve actuation or fault activation</u>.
13	Info	**Shutdowns, alarms, and annunciators**
13.4	Info	**Required shutdowns**
13.4.2		**Additional function devices** Any of the following function devices may be added: b) compressor: i) high interstage gas pressure(s) if 50 HP or greater; ii) high interstage temperature; iii) lubrication system failure; iv) high vibration; <u>v) gas detection; and</u> <u>vi) rate of rise heat detection; and</u>
14	Info	**Package structure**
14.4	Info	**Enclosure**
14.4.2		***New clause added;*** **Ventilation** The enclosure shall be ventilated so to maintain an environment that is below the manufacturer's specified component maximum operating temperature limit. The enclosure shall be ventilated to mitigate against potential gas accumulation to keep the environment below 25% of the LFL.
14.6		***New clause added;*** **Doors** A compressor enclosure large enough to admit service personnel inside the enclosure shall have a door that opens outwards and shall be equipped with panic hardware.

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17	Info	**Marking**
17.2		***New clause added;*** **Material** All markings shall be legible and permanent, such as metal stamping, moulding in a casting, a metal nameplate that is permanently secured, indelibly stamped lettering, or printed on pressure- sensitive labels secured by adhesive. Pressure-sensitive labels, upon investigation, shall be intended and appropriate for the application. Ordinary usage, handling, and the like, of the valve and the atmosphere in which it is used shall be considered in the determination of the permanence of the marking. Pressure-sensitive labels, or labels secured by cement or adhesive, shall comply with the applicable requirements for permanence and legibility in UL 969 or CSA 22.2 No. 0.15.
17.3	Info	**Package name plate (see Annex B)**
17.3.1		**Package nameplate requirements** The packager's nameplate shall include a) packager's name; b) model number; c) serial number; d) capacity at STP; e) electrical rating (voltage, phase, frequency, and amperage) and area classification; f) operating RPM; g) operating horsepower; h) operating temperature range; i) date or date code; j) minimum and maximum suction and discharge pressures; and k) packager's address and phone number.