Arlington VA, U.S.A., March 11, 2021

To:
Secretaría de Economía
Dirección General de Normas
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Re: PROYECTO de Norma Oficial Mexicana PROY-NOM-003-ENER-2020, Eficiencia térmica de calentadores de agua para uso doméstico y comercial. Límites, métodos de prueba y etiquetado.

Comments on WTO Notification G/TBT/N/MEX/488 issued on 13 January 2021.

Dear Secretaría de Economía,

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI)\(^1\) is pleased to comment on the draft Proyecto de Norma Oficial Mexicana PROY-NOM-003-ENER-2020, Eficiencia térmica de calentadores de agua para uso doméstico y comercial. Límites, métodos de prueba y etiquetado. AHRI commends Mexico for its efforts to set Minimum Energy Performance Standards (MEPS), which AHRI supports in principle. If countries can verify energy efficiency performance, MEPS help government achieve energy efficiency goals while benefitting industry and the consumer by promoting a level playing field where purchasing decisions can be made on the basis of quality.

First, AHRI recommends that the revision of this standard references ASHRAE\(^2\) Standard 118:2 Method of Testing for Rating Residential Water Heaters. Referencing ASHRAE Standard 118:2 (which is currently under revision) will ensure a more accurate measure of energy efficiency. AHRI develops industry-recognized testing and rating performance standards for various equipment categories, the referencing of which in energy efficiency regulations is the foundation for the

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\(^1\) AHRI is the trade association representing manufacturers of heating, cooling, water heating, and commercial refrigeration equipment. With more than 300 manufacturing members from virtually every continent, AHRI is an advocate for the industry and develops standards for and certifies the performance of many of the products manufactured by the global industry. The annual output of the heating, ventilation, air conditioning and refrigeration (HVACR) and water heating industry is worth more than $44 billion. In the United States alone, the HVACR and water heating industry supports 1.3 million jobs and $256 billion in economic activity annually, and accounts for more than 90 percent of residential and commercial HVACR and water heating equipment manufactured and sold in North America.

\(^2\) American Society of Heating, Refrigerating and Air-Conditioning Engineers
Second recommendation below. These standards are international standards per the six criteria\(^3\) identified by the World Trade Organization (WTO) Agreement\(^4\) on Technical Barriers to Trade.

Second, AHRI recommends the use of its voluntary equipment certification program as a verification system. This system is used by regulators globally for an accurate and unbiased evaluation of the claimed energy efficiency of HVACR and water heating equipment. For example, to enforce its energy efficiency policies, Mexican officials or customs officers can access test data in the AHRI Directory of Certified Product Performance to examine the performance of approximately four million equipment models.\(^5\)

Additional comments can be found in Attachment 1.

**Detailed Comments**

**Water Heaters – Add Reference to ASHRAE Standard 118:2**

Regarding water heaters, AHRI recommends that the revised standard also reference ASHRAE Standard 118.2: Method of Testing for Rating Residential Water Heaters, the next version of which is pending publication. Citing this standard will allow for a more accurate energy efficiency rating and provide Mexican consumers access to a wider variety of water heaters at a lower price.

**Multipath Approach to Referencing Standards**

As explained above, referencing ASHRAE Standard 118:2 will offer Mexico a stronger foundation to build and implement its energy efficiency policies. If Mexico already has decided to omit a reference to ASHRAE Standard 118:2 in the draft standard, AHRI recommends a “multipath approach” to compliance for Mexico’s energy efficiency policies, which will strengthen those policies and provide an increased selection of energy efficient equipment to consumers.

Various countries already accept equipment tested to either two or more standards without duplicative testing and certification. Products that are AHRI Certified undergo a much more rigorous testing program compared to any other certification program in the world. Therefore, Mexico can confidently allow AHRI Certified products into its market. Accommodating a “multipath

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\(^4\) Agreement of Technical Barriers to Trade (TBT) and its relevant Decisions of the TBT Committee.

\(^5\) AHRI’s standards and certification programs are credentialed as follows:
- AHRI is accredited to ISO 17065 as a Certification Body (CB) by COFRAC (the national accreditation body of France) and SCC (Standards Council of Canada);
- AHRI is an approved CB by the U.S. Environmental Protection Agency (EPA) for the ENERGY STAR® program;
- AHRI facilitates regulatory reporting compliance by submitting certification reports on behalf of its certification participants to the Department of Energy (DOE), California Energy Commission (CEC), Natural Resources Canada (NRCan); and
- Manufacturers in the AHRI certification programs can register AHRI certified products to comply with the Minimum Energy Performance standards (MEPS) set forth by the Saudi Standards, Metrology and Quality Organization (SASO) without additional testing.
approach* to compliance will create a more competitive market and allow the Mexican consumer more product choice and lower prices.

**Strengthening and Simplifying Energy Efficiency Performance Verification**

Acceptance of AHRI Certified products is the foundation for Mexico to use the AHRI Certification Program to improve the implementation and verification of Mexico’s energy efficiency policies. To accomplish this, Mexico can use the energy efficiency test data on the AHRI Directory to verify the performance of equipment imported into or manufactured in Mexico. Access to the Directory is free of charge and available online to government officials. Equipment that has been AHRI Certified will have an AHRI certificate showing both the equipment capacity, and energy efficiency rating, as determined using the relevant AHRI standard. Authorized certification bodies in Mexico can verify on AHRI’s publicly available Directory, the authenticity of this certificate to verify compliance to existing energy efficiency regulations.

AHRI believes that equipment performance needs to be documented through rigorous testing, such as through AHRI’s certification program. An introduction to the program and more specific details, including processes and testing requirements, are listed in the Certification Operations Manual.

AHRI contracts independent third-party laboratories globally to test equipment, all of which undergo an onerous qualification process by AHRI staff. Further, all labs are accredited to ISO 17025: General Requirements for the Competence of Testing and Calibration Laboratories. These laboratories are selected by AHRI through a competitive bidding process and then vetted extensively on testing competence, to standards and practices far more detailed and rigorous than those found in ISO 17025. All AHRI tests are conducted or witnessed by qualified laboratory personnel. There is no equivalent certification method within the ISO system.

Therefore, we recommend that Mexico accept AHRI Certified equipment as compliant for its energy efficiency policies, not only for water heaters but for a full range of equipment categories, as outlined here. This would lead to large monetary and administrative savings on the part of government regulators and manufacturers, which could all be passed on to consumers in the form of lower prices and a wider choice of products with verified energy efficiency ratings.

AHRI appreciates this opportunity to provide information to the Dirección General de Normas. If you have any questions or wish to discuss this further, please do not hesitate to contact me at (1) (703) 303 2493 or at jwalters@ahrinet.org.

Sincerely,

\[Signature\]

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6 The opportunity to use AHRI’s Certification Program goes beyond water heaters to a large variety of HVACR and water heating equipment.
Efficiency and Harmonization:
This draft standard provides significant improvements over the current NOM-003-ENER-2011 in that it incorporates 24-hour simulated use elements including heater set-up, multiple water draws and measurement of gas consumption during standby, along with new label information. The test utilizes some aspects garnered from the U.S. Department of Energy (DOE) water heater test procedure, however it falls short in harmonizing with either the test method or the energy efficiency measures. Unlike the U.S. test which yields a UEF – Uniform Energy Factor value, this test does not provide for the overall utilization energy and efficiency of a water heater. It measures and reports thermal efficiency and standby gas consumption separately. Developing this test further to include an overall efficiency measure would benefit consumers and provide a more accurate value of energy savings for high-efficient products. For example, efficiency benefits provided by instantaneous water heaters, which have minimal standby losses/no pilot flame, are disadvantaged by this standard in that the true efficiency is not represented.

The MEPS levels in table 1 appear to have been translated for this new test without significant increases in thermal efficiency, or a clear determination of any energy savings, which we understand was established as an objective in developing the proposal. We recommend the MEPS levels be revisited to quantify energy savings, if any, to substantiate the rationale for a more complex test. Otherwise, adjustments in MEPS should be considered. Also, high recovery and instantaneous water heater efficiency levels appear to be disproportionally set. We recommend that the instantaneous water heater minimum thermal efficiency value be set to 84% rather than 85%, and be more closely tied to the High Recovery category. Products operating too close to condensing levels (85%+) should be avoided as they may result in
reduced product life and increased risk for vent corrosion. Separate and much higher (90%+) MEPS levels should be encouraged for the condensing class of water heaters.

Standard Scope:
The scope of the standard applies to both residential and commercial gas-fired water heaters with thermal load, working pressures, and water temperatures as specified in section 1.0. Although this is unchanged from the NOM-003-ENER-2011 version, application of the new test for commercial water heaters (thermal loading between 35.0 kW to 108.0 kW) has not been fully validated with testing.

Calculations
For Section 8.8.1 Thermal Efficiency and Section 8.8.2 Gas Consumption in Standby Mode, the equations for gas correction only reflect standard temperatures and pressures conditions. We recommend that a correction factor be added to account for testing at different conditions. (We understand that these equations have already been submitted to ANFAD for consideration.)

Recommended change:

$$\eta = \frac{M_1P \times Cp \times (T_{OUT} - T_{IN}) + M_2 \times Cp \times (T_{MAX} - T_0)}{Q_f \times Ft \times Fp \times (PC)} \times 100$$

Recommended change:

$$S = (V_G \times FP \times FT) \times \left(\frac{T_{prom} - T_{IN ref}}{T_{prom} - T_{amb \ prom}}\right) \times \left(\frac{T_{OUT ref}}{T_{prom} - T_{amb \ prom}}\right) \times \left(\frac{Ft}{t_{24h}}\right)$$

8.5.2: Adjustment of Inlet Pressure and Table #3
Section 8.5.2 and Table #3 requires the fuel gas pressure tolerance remain within +/- 2% during the test, which appears to be reasonable and consistent with the current standard. However, variation in gas calorific value and test elevation will cause variation in thermal loading and thermal efficiency favoring some labs over others. Instructions to correct this, such as pressure adjustment or orifice changes are not included in the standard and should be addressed, which is also going to improve test repeatability.

Establishing Maximum Average Temperature (TMax)
We recommend measurement improvements for TMax, which is determined following the end of the recovery period. After burner cut-off, the temperature continues to increase, so the measurement timing should be adjusted – delayed to capture the maximum average temperature. Measuring this value too early without confirming the maximum temperature has been reached will result in low and inaccurate efficiency values. This is particularly important for High recover products and high thermal load commercial water heaters.
Test Repeatability
We are concerned with the repeatability of this new test given that it is more complex as compared to the current test. If not addressed, test-to-test and lab-to-lab variation will adversely impact initial product rating for manufacturers and ongoing compliance verification for government authorities. We recommend further industry testing including round-robin with government, third-party and private labs to address test and set-up variation. Further, we believe a guidance document should be developed to provide additional details for test setup and specific instructions for testing at different elevations.