Arlington, VA., U.S.A., April 3, 2020

To:
Instituto Nacional de Metrologia, Qualidade e Tecnologia – Inmetro
Diretoria de Avaliação da Conformidade - Dconf
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CEP: 25.250-020 - Duque de Caxias - RJ, ou
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Re: Portaria Nº 01, de 27 de Janeiro de 2020 - Proposta de aperfeiçoamento parcial dos Requisitos de Avaliação da Conformidade para Condicionadores de Ar

Comments on WTO Notification G/TBT/N/BRA/964 issued on 11 February 2020.

Dear National Institute of Metrology, Quality and Technology (INMETRO):

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI)\(^1\) is pleased to provide comments to the National Institute of Metrology, Quality and Technology (INMETRO) regarding Portaria Nº 01, de 27 de Janeiro de 2020 - Proposta de aperfeiçoamento parcial dos Requisitos de Avaliação da Conformidade para Condicionadores de Ar (Portaria Nº 01). AHRI commends Brazil 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 Portaria Nº 01 include a reference to AHRI Testing and Rating Standard 210/240-2017, *Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment*, which is available free of charge [here](http://www.ahrinet.org/Standards/HVACR-Industry-Standards). Referencing AHRI Standard 210/240 will ensure a more accurate measure of energy efficiency. AHRI develops industry-recognized testing and rating performance standards for a variety of industry equipment categories,\(^2\) the referencing of which in energy efficiency regulations is the foundation for the second recommendation below.

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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 & 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.

\(^2\) All AHRI standards are available free from our website, [http://www.ahrinet.org/Standards/HVACR-Industry-Standards](http://www.ahrinet.org/Standards/HVACR-Industry-Standards).
These standards are international standards per the six criteria identified by the World Trade Organization (WTO) Agreement 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, Brazilian 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.


Our below comments indicate our concern that Portaria Nº 01 references only ISO 5151 and ISO 16358-1. As explained below, adding a reference to AHRI standard 210/240 will result in more accurate measurements of energy efficiency and a more competitive market for the products under the scope of this regulation.

**Detailed Comments**

**Air Conditioners – Add Reference to AHRI Standard 210/240**

As noted above, we understand that the rating conditions and the test method for Portaria Nº 01 are based on testing in accordance with ISO Standard 5151:2017, Non-Ducted Air Conditioners and Heat Pumps - Testing and Rating for Performance. AHRI therefore strongly recommends that Portaria Nº 01 also reference AHRI Standard 210/240 in order to create testing and rating performance procedures that more accurately reflect the energy use of the equipment. This will

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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.
allow Brazilian authorities to verify (using AHRI’s Directory) a broader range of equipment (without building testing labs and administering a certification testing program). This in turn will lead to a more competitive market where consumers have a larger range of product choices based on certified energy efficiency performance.

Most importantly, AHRI Standard 210/240 allows for measuring equipment during “partial load” conditions, meaning when the machine runs at part of its capable load of cooling or heating. On the other hand, and of less utility in achieving energy efficiency goals, ISO 5151 uses the Energy Efficiency Ratio (EER) metric and only measures “full load” conditions, resulting in a less accurate measurement. Real life climate conditions, including temperature fluctuations (both between seasons and throughout the day) dictate that the machine runs at “full load” for only part of its operation.

AHRI Standard 210/240 allows for a “partial load” calculation using the metric Seasonal Energy Efficiency Ratio (SEER), expressed in BTU/(Wh). SEER values indicate equipment efficiency. Higher SEER values correspond to more efficient cooling equipment.

SEER ratings are assigned to every unit produced so consumers can determine the value of each product relative to cost and efficiency, and help consumers predict their overall energy expenditures for the cooling season. In the U.S., as well as a number of other countries, SEER replaced EER as the accepted method for calculating air conditioning efficiency because it is a more meaningful measurement of equipment performance.

Many countries now understand the importance of measuring equipment according to “partial load” conditions and are choosing to reference AHRI Standard 210/240. In the past years, Mexico for example has chosen to reference AHRI Standard 210/240 in NOM-023-ENER 2018 (Ductless, Split AC) and NOM-026-ENER 2015 (Split AC with inverter).

Referencing only ISO 5151 also severely limits the scope of Brazil’s energy efficiency efforts and will reduce the variety of energy efficient models available to the consumer. ISO 5151 is applicable to (1) ductless air conditioners and/or heat pumps; and (2) ducted air conditioners and/or heat pumps rated only up to 8kW. AHRI Standard 210/240 covers both ductless and ducted products to 19kW. Referencing AHRI Standard 210/240 provides Brazil’s authorities with a more realistic market-oriented reference for its energy efficiency policies.

Reference to ISO 16358-1

AHRI also notes the reference to ISO 16358-1, *Air-cooled air conditioners and air-to-air heat pumps - Testing and calculating methods for seasonal performance factors - Part 1: Cooling*

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6 SEER is the total heat removed from the conditioned space during the annual cooling season divided by the total electrical energy consumed by the air conditioner or heat pump during the same season.
7 BTU/Wh can be converted to W/W easily by dividing by 3.4121.
8 The reference to AHRI 210/240 is located in Article 14. Bibliography, page 39.
9 Reference to AHRI 210/240 is located in Article 13. Bibliography, page 25.
seasonal performance factor. As its title implies, this ISO standard specifies how to test for seasonal (or “partial” load or capacity) performance, but it requires that only a few part-load test points are measured. In order to compensate for the few testing points, what ISO 16358-1 essentially dictates is an estimation for the untested capacity points. This is done by multiplication using a set of constants that were proposed by certain manufacturers guiding the development of ISO 16358-1.

That calculation is not proven by the engineering community at large. Furthermore, AHRI is currently attempting to quantify the results of these estimations. In particular, AHRI is working with a regulator in Saudi Arabia to show how the few testing points in this ISO standard are inadequate to rate equipment energy efficiency performance. As of the date of this letter, preliminary data show that equipment tested according to ISO 16358-1 will result in approximately a 10% variance of the true performance.

Meanwhile, AHRI Standard 210/240 dictates the use of a much more complete load operating map and has more test points to determine the energy efficiency rating. In sum, the following table compares both standards, AHRI 210/240 and ISO 16358-1, with respect to the number of testing points.

<table>
<thead>
<tr>
<th>A/C Type</th>
<th>Level of Technology</th>
<th>Number of Testing Points</th>
<th>Number of Testing Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AHRI 210/240</td>
<td>ISO 16358-1</td>
</tr>
<tr>
<td>Fixed Speed</td>
<td>Less Complex</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Two-Stage</td>
<td>More Complex</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Multi-Stage</td>
<td></td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Variable Speed</td>
<td></td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: “Level of Technology” refers to the range of equipment from fixed speed (on-off equipment) to variable speed (inverter equipment).

Both AHRI Standard 210/240 and ISO 16358-1 are designed to rate the part-load energy efficiency of equipment. Also, both are designed to calculate SEER (AHRI) and CSPF\(^1\) (ISO) and use the same basic approach, an averaged efficiency of seasonal effects. In fact, SEER and CSPF are essentially the same metric.\(^1\) While the approach or definition of seasonal performance appears fundamentally the same in both standards, the fact that ISO 16358 has fewer test points than AHRI Standard 210/240 means that there is greater uncertainty about the validity of the resulting energy efficiency ratings using ISO 16358.

Allowing products tested and certified by AHRI Standard 210/240 without additional testing provides Brazilian authorities and consumers with more accurate energy efficiency ratings than

\(^1\) Cooling Seasonal Performance Factor

\(^1\) Cooling Seasonal Performance Factor, obtained by dividing SEER by 3.4121. (see Footnote 7).
can be provided by the similar but less rigorous and less accurate ISO standard, thus increasing the selection of equipment while helping Brazil achieve national energy efficiency goals.

Multipath Approach to Referencing Standards

As explained above, referencing AHRI Standard 210/240 instead of ISO 5151 and ISO 16358-1 will offer Brazil a stronger foundation to build and implement its energy efficiency policies. Nevertheless, we understand if Brazil has already decided to reference ISO 5151 and ISO 16358-1 in Portaria Nº 01. In this instance, AHRI advocates a “multipath approach” to compliance of Brazil’s energy efficiency policies.

Various countries already accept equipment tested to either the applicable ISO or AHRI standard 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, Brazil can with confidence allow AHRI Certified products (tested according to AHRI Standard 210/240) into its market without costly and lengthy duplicative testing and certification within Brazil. Test results from both standards may be similar, but AHRI Certified equipment tested according to AHRI Standard 210/240 will have a much more reliable energy efficiency rating. The rating of the equipment tested according to ISO 5151 and ISO 16358-1 will be much less reliable (with a large variance of uncertainty). Accommodating a “multipath approach” to compliance will create a more competitive market and allow the Brazilian consumer more product choice and lower prices.

Strengthening and Simplifying Energy Efficiency Performance Verification

Referencing AHRI Standard 210/240 (either instead or in addition to ISO 5151 and ISO 16358-1 as explained above) is the foundation for Brazil to use the AHRI Certification Program to improve the implementation and verification of Brazil’s energy efficiency policies. To accomplish this, Brazilian officials or customs officers can use the energy efficiency test data on the AHRI Directory to verify the performance of equipment imported into or manufactured in Brazil. Access to the Directory is free of charge and available online to governments and consumers. Equipment that has been AHRI Certified will have an AHRI Certificate showing the equipment capacity and energy efficiency rating as determined using the relevant AHRI Standard. Authorized certification bodies in Brazil can use AHRI’s publicly available Directory to verify the authenticity of this Certificate, as well as compliance to existing energy efficiency regulations.

AHRI believes that equipment performance should be documented through rigorous, systematic testing, such as through AHRI’s Certification Program. More specific details about the Certification

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12 The opportunity to use AHRI’s certification program is valid for a large variety of HVACR and water heating equipment.
Programs, including processes and testing requirements, are listed in the Certification Operations Manual. Pages 1-4 contain an introduction to the AHRI certification program and explain the purpose of the program.

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 system within the ISO system.

Therefore, we recommend that Brazil accept AHRI Certified equipment as compliant for its energy efficiency policies, not only for air conditioners and heat pumps 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 wider choice of products with verified energy efficiency ratings.

AHRI appreciates this opportunity to provide information to INMETRO regarding Portaria Nº 01 and would be glad to discuss these matters in more detail. We look forward to new and challenging opportunities to support the work of INMETRO in the future.

If you have any questions or wish to discuss this further, please do not hesitate to call me at (1) (703) 600-0338.

Sincerely,

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In an effort to help contain the spread of the COVID-19 virus, AHRI staff will move to a total telework policy beginning Tuesday, March 17. We all have the technological capability to carry out our responsibilities working remotely and our commitment to quality service to our members remains unchanged during this unprecedented period.
Under this policy, all interactions between AHRI staff and members will occur only in a virtual manner, i.e., via conference call, email, or telephone. Any currently scheduled in-person meetings, including at our office or at our members’ offices, will be transitioned to virtual meetings or postponed until a later date. This policy will remain in effect until further notice.

We appreciate your patience and urge you to contact us if you have questions or concerns.