



Residential Test Methods for Air Conditioners: Benefits and Challenges of International Alignment

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Benefits of International Alignment

- Test Burden
 - Performance (capacity and efficiency), reliability and safety testing consume significant manufacturer resources during new product development. Steps to reduce the amount of testing required is beneficial to bringing newer, more efficient products to market in less time.
- Marketability
 - Utilizing the same test procedure for multiple countries will allow manufacturers, distributors and retailers of subject products to be able to market and sell the newer, more efficient products into broader markets.
- Performance Representation
 - Recent changes in test procedures provide performance representations that are more typical of actual applications. An aligned international test procedure will help to provide equipment rating values that are more consistent with product applications. This will help with determining relative performance of products.
- Equipment Capabilities
 - Technology has changed significantly in recent decades. New HVAC equipment has many control options for improved comfort and efficiency, such as humidity control, peak load reduction, etc. A harmonized test procedure could account for the energy consumption reduction of such products.

Challenges of International Alignment

- Ambient Condition Variation
 - Indoor and outdoor ambient conditions vary greatly across the globe. One test procedure that covers the extremes of cold, mild and hot outdoor temperatures, dry, moist and marine outdoor conditions, as well as differing indoor conditions, all while reducing test burden would be difficult.
- Controls / IoT
 - The range of control schemes and IoT applications that could affect energy consumption is virtually limitless. Options may include control changes based upon consumer behaviour or ambient conditions. Ideally, the test procedure would be able to provide a method of reasonably estimating energy savings for various functions.
- Building Load
 - Most equipment performance representations are based upon an assumed building load. Actual building load, however, varies significantly based upon many factors. Preferably an aligned test procedure would provide information necessary to be able to estimate performance for diverse building applications.
- Reproducibility / Repeatability
 - A test procedure should be defined such that very similar results will be produced regardless of which test facility or location is used for testing. Further, test procedure requirements should be such that if the same product is removed then reinstalled in the same facility, very similar measured findings occur.