AHRI Standard 1120

2012 (R2021) Standard for

Acoustical Test Methods and Sound Power Rating Procedures for Transport Refrigeration Equipment

AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
we make life better®

2311 Wilson Boulevard, Suite 400
Arlington, VA 22201, USA
www.ahrinet.org
PH 703.524.8800
FX 703.562.1942

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IMPORTANT

SAFETY RECOMMENDATIONS

It is strongly recommended that the product be designed, constructed, assembled and installed in accordance with nationally recognized safety requirements appropriate for products covered by this standard.

AHRI, as a manufacturers' trade association, uses its best efforts to develop standards employing state-of-the-art and accepted industry practices. However, AHRI does not certify or guarantee safety of any products, components or systems designed, tested, rated, installed or operated in accordance with these standards or that any tests conducted under its standards will be non-hazardous or free from risk.

Note:

This standard supersedes ANSI/AHRI Standard 1120-2007.

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ACOUSTICAL TEST METHODS AND SOUND POWER RATING PROCEDURES FOR TRANSPORT REFRIGERATION EQUIPMENT

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish acoustical test methods for Transport Refrigeration Equipment and to provide definitions; test requirements; rating requirements; minimum data requirements for Published Ratings; and conformance conditions.

1.1.1 Intent. This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 Review and Amendment. This standard is subject to review and amendment as technology advances.

Section 2. Scope

2.1 *Scope.* This standard applies to factory-made Transport Refrigeration Equipment.

Section 3. Definitions

All terms in this document shall follow the standard industry definitions in the current edition of ASHRAE Terminology of Heating, Ventilation, Air-Conditioning, and Refrigeration unless otherwise defined in this section.

3.1 *Transport Refrigeration Equipment.* A combination of one or more factory-made assemblies, which may include a compressor, an internal combustion engine or electric motor, and condenser combination; an evaporator or air-cooler; all necessary refrigerant lines and electrical wiring; and means whereby the unit can be suitably mounted and installed on a vehicle which it is intended to serve. Where such equipment is used in more than one assembly, the individual assemblies are designed to be used together, and the rating requirements outlined in this standard are based upon the use of matched assemblies. Examples of Transport Refrigeration Equipment include:

3.1.1 *Truck Transport Refrigeration Unit*. A refrigeration unit typically mounted above the truck cab on the front of an insulated box that is part of a unified chassis. Truck units may be autonomous or non-autonomous. Small non-autonomous truck units are often mounted to the roofs of vans or insulated boxes on small trucks.

3.1.2 *Autonomous Transport Refrigeration Unit.* Autonomous refrigeration equipment has its own power supply, most frequently a self-contained engine, and a means of moving refrigerant enabling it to control temperature without the support of a vehicle or electric power supply.

3.1.3 *Container Transport Refrigeration Unit.* Container units are non-autonomous electric refrigeration units comprising one end of insulated shipping containers that control temperature most frequently in ocean-going shipping containers. Power for container units is supplied by the electric mains in port, by the ship at sea, and by Gensets when the container is being moved by road or rail.

3.1.4 *Cryogenic Transport Refrigeration Unit.* Cryogenic units utilize the heat transfer from a cryogenic fluid flowing through a coil in an insulated space to maintain temperature. These units can be autonomous if the energy of the fluid is used to power fans or non-autonomous when fans receive their power from the truck.

3.1.5 *Eutectic Transport Refrigeration Unit*. Temperature in the refrigerated space is maintained at the designed melting temperature of an encased fluid lining the interior walls and/or ceiling of the insulated cargo space. A non-autonomous electric refrigeration unit is part of a eutectic system, which freezes the fluid while the vehicle is stationary and plugged into the electric mains. Temperature control is available in eutectic units until the fluid has completely melted. Noise from a eutectic unit exists when the electric power is connected and the fluid is being frozen.

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3.1.6 *Genset.* In transport refrigeration applications, a Genset is comprised of an engine, a generator, and a fuel tank and is designed to supply electrical power to container units being transported over land on rail cars or trailers. Some Gensets mount to the container unit itself while others mount under the chassis carrying the container.

3.1.7 *Non-autonomous Transport Refrigeration Unit.* Non-autonomous refrigeration equipment cannot operate without external power. Some non-autonomous equipment requires a truck engine to run the compressor that moves the refrigerant and/or a truck engine turning an alternator to supply electrical power. Other non-autonomous equipment requires power from the electric mains.

3.1.8 *Trailer Transport Refrigeration Unit*. A refrigeration unit mounted on the front of an insulated trailer. Fuel for trailer units is supplied from a tank mounted under the trailer enabling the unit to run independent of a tractor. Trailer units are autonomous equipment.

3.1.9 *Undermount Transport Refrigeration Unit*. Undermount units are designed to mount just below insulated boxes on a unified chassis as well as short trailers. Undermount units can be autonomous or non-autonomous.

3.2 *Octave Band*. A band of sound covering a range of frequencies such that the highest is twice the lowest, as used in this standard and shown in Table 1.

Table 1. Standard Frequency Bands[1]

Octave Band			One-third Octave Band		
Lower Frequency Limit, Hz	Center Frequency, Hz[2]	Upper Frequency Limit, Hz	Lower Frequency Limit, Hz	Center Frequency, Hz[2]	Upper Frequency Limit, Hz
44	63[3]	90	44	50[3]	56
			56	63[3]	71
			71	80[3]	90
90	125	180	90	100	112
			112	125	140
			140	160	180
180	250	355	180	200	224
			224	250	280
			280	315	355
355	500	710	355	400	450
			450	500	560
			560	630	710
710	1,000	1,400	710	800	900
			900	1,000	1,120
			1,120	1,250	1,400
1,400	2,000	2,800	1,400	1,600	1,800
			1,800	2,000	2,240
			2,240	2,500	2,800
2,800	4,000	5,600	2,800	3,150	3,550
			3,550	4,000	4,500
			4,500	5,000	5,600
5,600	8,000	11,200	5,600	6,300	7,100
			7,100	8,000	9,000
			9,000	10,000	11,200

Notes:
1. The frequencies have been rounded off to whole numbers.
2. The geometric mean of the frequency limits.
3. These bands are considered to be optional.

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