



SMACNA POSITION PAPER

“EARLY START-UP OF PERMANENTLY INSTALLED HVAC SYSTEMS”

Contractors are increasingly being required to perform early start-up of HVAC systems for the use of temporary heating, cooling or dehumidification during the construction process. This practice can pose a significant impact to the integrity of the HVAC equipment and HVAC distribution system.

SMACNA has developed several documents in reference to concerns related early start-up of HVAC systems.

The document on Temporary Uses of HVAC Systems in Building Construction Projects outlines the realities and risks of using temporary heating, cooling and dehumidification equipment. It is intended for contractors to use in discussions with owners and general contractors. Also included are recommendations for contractors when responding to requests for early start-up of equipment for heating, cooling or moisture removal.

Early start-up of HVAC systems can often create serious issues and concerns with regard to warranties and service. An additional attached document addresses these issues, and provides sample warranty language with regard to construction heaters. The document further addresses options for contractors upon receiving requests for early start-up of equipment. Finally, included is a sample letter from an HVAC subcontractor to a project owner outlining the issues involved with early start-up of equipment.

***Temporary Uses (Early Start-Up) of HVAC Systems
In Building Construction Projects –
The Realities and Risks of Using Permanent HVAC Systems***

Owners contemplating the use of temporary heat should understand the short and long term risks of using the permanent HVAC system for temporary heat. Permanent HVAC systems are specifically designed to provide comfortable, clean air conditioning for a tightly enclosed, soundly constructed building and not buildings under construction.

With rare exception, it is not in the best interest of the building's owner to operate permanent HVAC system for temporary heating or cooling purposes during construction. Equipment specifically designed to provide temporary heat is available, both for rental and purchase, and should be used to meet temporary construction requirements.

The risks to the building's owner when using the permanent HVAC system for temporary heat include:

1. Misuse of permanent HVAC systems to heat out (bake out) open areas under construction because such operations exceed design specifications. The filter systems - even with the addition of construction or pre-filters – are also incapable of providing the dust holding capacity required to protect the permanent HVAC equipment and duct system. Construction filters cannot sufficiently protect the permanent HVAC system from excessive amounts of construction dust, particularly the most common source, dust created from sheet rock sanding.
2. Use of the permanent HVAC system in an attempt to dry wet surfaces, such as drying recently-poured concrete floors to permit or expedite the installation of carpet or wooden floors. Permanent HVAC systems are not designed or constructed to perform in such a manner. Indeed such activities may result in subsequent IAQ problems associated with mold and other related airborne contaminants.
3. Initiation of the HVAC equipment warranty period when the equipment is started. Early startup of the permanent HVAC system for temporary heating, cooling, dehumidification, or for other reasons may also void the warranty on that system's equipment.
4. Early startup of the permanently installed HVAC system will result in reduced equipment life, operating efficiencies, and potential equipment damage. Understand, for example that:
 - Motors typically used in HVAC applications have open windings and the accumulation of construction dust raises the operating temperature and leaches oil away from bearings.
 - Coils are manufactured under very clean conditions but have by design residual oil on the heat exchanger surfaces, which cause dust not captured by filters to tightly adhere to the

surface. This reduces the efficiency of the energy exchange, especially when cooling coils condense moisture causing certain types of dust (from sheetrock and plaster) to harden.

5. The potential of increased tenant complaints and claims. Dust and particulates in HVAC ductwork is increased exponentially when the permanently installed HVAC system is used for temporary heating, cooling or dehumidification during the construction process. In such circumstances, the stage is set for potential mold related conditions and consequent tenant complaints.
6. Total energy costs will generally be higher than the cost to use temporary heating, cooling and dehumidification equipment readily available in the market place. For a permanent HVAC system to have any beneficial effect in heating or cooling a construction site requires continuous operation at maximum capacity. In contrast temporary heating and moisture removal equipment use energy directed to exactly where it is needed and the total energy costs are usually less.

Field reports and years of industry experience with the detrimental effects of the misuse of permanent HVAC systems when used for temporary activities or tasks during construction should compel owners and their agents to make a more informed decision.

A well informed owner will choose the less risky path of using the proper temporary equipment to condition projects under construction.

Recommendations for SMACNA Members When Operating Permanent HVAC Systems for Temporary Heating, Cooling or Moisture Removal

- **Written authorization from the building's owner should be provided.**

Because all HVAC parts and labor warranties begin at HVAC start-up, in addition to other issues involved, the owner should be informed and must consent *in writing* to early start up of the permanent HVAC for temporary heating or cooling purposes.

- **All condensate traps and drains must be in place and functioning.**

The building codes require appropriate operating condensate drains on all HVAC equipment, including cooling. Water flows from unconnected condensate drains are capable of damaging materials susceptible to water damage - ceiling tiles, gypsum board, carpets, etc. Unfiltered airflow from unconnected condensate drains will contaminate cooling coils, fan motors, and interior duct liner and duct surfaces.

- **All controls and fire and smoke dampers must be inspected and operating.**

HVAC equipment cannot be operated without full system control and protection in place. This is first and foremost a safety concern as improperly operating dampers can result in over-pressurization of ducts and potential structural failure and/or damage.

- **Permanent power and circuit breakers, and permanent gas and water must be connected to all HVAC equipment.**

This is both code compliance and a safety issue, and failure to comply may have serious legal and safety and health consequences.

- **It is recommended that the return air duct to HVAC equipment be isolated from any drywall sanding or other dust-generating construction activities.**

It is almost impossible to prevent dust from entering the return air duct system when any dry wall sanding or other dust generating activities are present. Typical construction filters will not catch all drywall dust – any dust that adheres to cooling coils will harden. If drywall sanding dust hardens on the cooling coils, coil replacements may be required, which will not be covered by any labor or material warranties. In addition, fine dust that cannot be caught by filters will accumulate within the HVAC equipment and duct system.

- **Change order authorization.**

In the event a requirement to provide temporary heating, cooling or moisture removal when operating permanent HVAC systems was not included in the bid specifications, a change order is required to cover the costs of labor and material to operate the system, and change the filters as necessary.

Early Start-up of Permanently Installed HVAC Systems – Warranties, Refusals and other Potential Safeguards

Owners and contractors often request HVAC subcontractors to start-up systems early to accommodate a wide variety of construction and operational needs in warm, humid and cold climates. A serious and significant issue can arise with respect to manufacturers' warranties when an HVAC subcontractor acts on this request.

Voided Warranties. Many manufacturers' warranties void use of permanent HVAC systems as "construction heaters". The following are examples from actual manufacturers' warranties:

The Company warrants for a period of 12 months from initial start-up or 18 months from the date of shipment, whichever is less, that the Company products covered by this order (1) are free from defects in material and workmanship and (2) have the capacities and ratings set forth in the Company's catalogs and bulletins, provided that no warranty is made against corrosion, erosion or deterioration. The Company's obligations and liabilities under this warranty are limited to furnishing f.o.b. factory or warehouse at the Company designated shipping point, freight allowed to Buyer's city (or port of export for shipment outside the conterminous United States), replacement equipment (or at the option of the Company part therefore) for all Company products not performing to this warranty and which have been returned to the manufacturer. The Company shall not be obligated to pay for the cost of lost refrigerant. No liability whatsoever shall attach to the Company until said products have been paid for and then said liability shall be limited to the purchase of the equipment shown to be defective.

The Company makes certain further warranty protection available on an optional extra-cost basis. Any further warranty must be in writing, signed by an officer of the Company.

Warranty and liability set forth herein are in lieu of all other warranties and liabilities, whether in contract or negligence, express or implied, in law or in fact, including implied warranties of merchantability and fitness for a particular use. In no event shall the Company be liable for any incidental or consequential damages.

and also see:

NOTE – These units must not be used as a "construction heater" at any time during any phase of construction. Very low return air temperatures, harmful vapors, and misplacement of the filters will damage the unit and its efficiency.

and also see:

WARNING

Do not use this furnace during construction if air laden corrosive compounds are present such as chlorine and fluorine. Otherwise, provisions must be taken to provide clean, uncontaminated combustion and ventilation air to the furnace. Furnace combustion and

ventilation air contaminated with these compounds form acids during combustion which corrodes the heat exchanger and component parts. Some of these contaminants are found in, but not limited to, paneling, drywall, adhesives, paints, stains, varnishes, sealers and masonry cleaning materials.

HVAC contractors must be keenly aware that there is a substantial likelihood that early start-up of permanent HVAC systems may void the warranty. Thus, when the system is damaged, air quality claims are made, or repair is required, it is the HVAC subcontractor and not the manufacturer who will face a claim.

HVAC CONTRACTOR OPTIONS

HVAC Contractors have several options regarding requests for early start-up of equipment. These include 1) to require owners/general contractors to use temporary systems, 2) to refuse to permit early start-up, 3) to include disclaimers, and 4) to request the owner/general contractor sign an “acknowledgment”.

1. One alternative to permitting the early start-up of permanently installed HVAC systems is to require owners/general contractors to use temporary systems for heating and/or cooling. The use of these temporary systems and including provisions requiring the use of such systems in contracts, presents a “best case” scenario and an attractive alternative to an outright refusal to “start-up” permanently installed HVAC systems early.
2. Another solution is to steadfastly refuse to permit early start-up of permanently installed HVAC systems. This solution, while initially appealing, is also potentially impractical. The refusal of a subcontractor to perform an early start-up can substantially harm a job and may undermine the subcontractor’s ability to perform or obtain future work. A consistent and absolute refusal is legally attractive and intellectually appealing because it avoids the entire problems by simply refusing to participate. However, as members have made clear, such a refusal may also be impractical for many, if not most, HVAC subcontractors.
3. Another potential remedy is for HVAC contractor bid proposals to include disclaimers for early start-up of permanently installed HVAC equipment. A provision such as the following could be included in a standard form contract:

_____ [Subcontractor’s name] will not be responsible or liable for any repairs, cleaning or other work caused by dirt/debris or other construction materials present in the HVAC system as a result of the early start-up of HVAC systems.

_____ [Subcontractor’s name] assumes no responsibility or liability for cleaning ductwork as a result of early use of HVAC systems prior to the completion of construction.

_____ [Subcontractor’s name] will not be responsible for any repairs as a result of early start-up of HVAC systems that are not covered by manufacturers’ warranties. Additionally manufacturers may refuse to honor warranties resulting from failures caused by early start-up of construction.

_____ [Subcontractor's name] shall not be liable to the owner, occupants or any party for any claim or damage resulting from the early start-up of the HVAC system.

4. Finally, in the event owners and/or general contractors request early start-up of permanently installed HVAC systems, another solution is to have the owner/general contractor sign an "acknowledgment" of the early start-up prior to turning on the system. A letter signed by both the HVAC contractor and owner can be used to address situations when an owner/general contractor requests an early start-up. An example form, by a SMACNA member, is attached as Appendix A (the exact form may vary depending on the circumstances leading up to the letter).

APPENDIX A

Note: These materials do not constitute legal advice. You should contact your attorney before making any specific legal decisions.

SAMPLE TEMPORARY HEATING LETTER TO PROJECT OWNER
FROM HVAC SUBCONTRACTOR
(ADDITIONAL LANGUAGE NEEDED FOR COOLING AND DEHUMIDIFYING)

[Use Letterhead of HVAC Subcontractor/Contractor]

[Insert Date]

[Insert Owner's/Contractor's Business Name and Address]

Re: [Insert Job Site Address or Project Reference]

Dear [Name]:

We received a phone call from _____ [owner's/contractor's representative] this afternoon directing us to start the _____ [HVAC project] so that it can be used for temporary construction heating. I would again like to reaffirm our position that temporary heat is not part of _____ [HVAC subcontractor's name] contract obligation on this project. I would also like to restate that the manufacturer's published information specifically prohibits the use of their equipment for the purpose of providing temporary construction heat. We are concerned about a number of potentially serious issues. They include:

- General failure of the unit and/or unit components caused by construction dirt and/or debris.
- Excessive service and maintenance caused by construction dirt and/or debris.
- Heat exchanger failure which could lead to a potentially lethal discharge of carbon monoxide gases into the ductwork and subsequently into the occupied spaces. This can be caused by excessively cold air entering the heat exchanger and causing an excessive temperature rise across the heat exchanger which could lead to metal fatigue and heat exchanger failure.
- There is also concern that as the furnace section cycles, the extremely hot heat exchanger will be exposed to extremely cold return air on restart causing stresses on the heat exchanger.

Either of the last two issues could lead to premature heat exchanger failure. Combustion gasses could then leak into the duct system and be distributed through the building. The manufacturer's position is that the warranty will be voided if the unit is used for temporary construction heat where the building is not properly enclosed and the heat exchangers can be exposed to cold return air. This could be the case in your building since there are quite a few areas that are not sealed where extremely cold air can infiltrate into the building.

Given the above, if you still want us to start the equipment and place it into use for temporary construction heating, we will do so under the following conditions:

- There will be no labor or material warranty on the _____ [HVAC] equipment. Should any failure occur at any time once the equipment is placed into service for temporary construction heat, _____ [owner] agrees to assume any and all responsibility for all service and repairs. _____ [HVAC subcontractor] will arrange for service only upon receipt of a purchase order for the requested service with payment due for services rendered within 10 days.
- _____ [HVAC subcontractor] will provide filter changes and routine scheduled maintenance only upon receipt of a purchase or change order for the requested service with payment due for services rendered within 10 days.
- _____ [Owner] will hold _____ [HVAC subcontractor], its agents and successors harmless for any consequential damages that might occur due to unit failure. This includes any potential property damage or personal injury and/or death should a heat exchanger or other component failure occur at any time in the future causing either damage to the facility or carbon monoxide poisoning of tenants, visitors or other individuals that might be exposed to an unsafe atmosphere in the building related to a _____ [HVAC] unit, heat exchanger or component failure.

We will proceed with the start-up of the equipment upon receipt of an original of this letter signed by you as [authorized representative] of _____ [Owner]. We will need this for our records to protect us from any potential liability in the future. Once we have received an original that is signed, we will start the equipment, place it into service and transfer responsibility for its operation and maintenance to _____.

If you have any questions, please feel free to call me.

Very truly yours,

_____ [HVAC Subcontractor]

By: _____

Its: _____

The foregoing is hereby accepted:

Authorized Signature [Owner]

Position

Date