

# TECHNICAL INFORMATION COMMUNICATION

Quality and Continuous Improvement

**Number:** TIC2013-0003

**Date:** 10/1/2013

**Title:** Affect of Drywall and Construction Dust on Motors

**Product Category:** Heating Products

## Products Affected

All gas furnaces.

## Situation

Forty percent (40%) of failed blower and inducer motors returned through the Special Requested Part (SRP) program failed due to drywall and/or construction dust. The level of dust coating on failed motors indicates the system ran without a filter or with inadequate filtration during construction.



## Technical Information

All major manufacturers, except one, allow use of gas furnaces during construction provided all requirements are met. Requirements that prevent drywall/construction dust damage are as follows:

- A permanent vent system is complete and sealed to unit.
- Air filters are installed and maintained throughout construction.
- 100% outside combustion air is provided during construction
- Heat exchangers, components, duct system, air filter, and coils are thoroughly cleaned following construction

Failure to follow the requirements for temporary heat during construction can result in the following failure modes.

**Heat Damage:** Drywall/construction dust has insulating properties. A coating of dust prevents heat dissipation from the motor. When motors cannot dissipate heat, internal components are damaged.

**Bearing Damage:** Drywall/construction dust can wick lubricating grease from bearings. When a bearing operates with reduced lubricant, heat from friction expands the bearing, which can lead

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to locked bearings. Also, drywall dust is highly abrasive. Continual operation of contaminated bearings contaminated will result in premature bearing wear and ultimately failure.

**Affect on Other Components:** Burners, heat exchangers and evaporator coils can be plugged by drywall/construction dust. Control boards can overheat in a manner similar to motors. Vent and drainage systems can become plugged with drywall and construction dust.

**Construction Heat Requirements:** If a furnace will be used for temporary heat during construction, the following instructions MUST be followed. These requirements are located in the Location section of each Installation Instruction document.

9. The furnace may be used for construction heat provided that the furnace installation and operation complies with the first **CAUTION** in the **LOCATION** section of these instructions.

**▲ CAUTION**

**PERSONAL INJURY AND/OR PROPERTY  
DAMAGE HAZARD**

Improper use or installation of this furnace may result in premature furnace component failure. This gas furnace may be used for heating buildings under construction provided that:

- The furnace is permanently installed with all electrical wiring, piping, venting and ducting installed according to these installation instructions. A return air duct is provided, sealed to the furnace casing, and terminated outside the space containing the furnace. This prevents a negative pressure condition as created by the circulating air blower, causing a flame rollout and/or drawing combustion products into the structure.
- The furnace is controlled by a thermostat. It may not be "hot wired" to provide heat continuously to the structure without thermostatic control.
- Clean outside air is provided for combustion. This is to minimize the corrosive effects of adhesives, sealers and other construction materials. It also prevents the entrainment of drywall dust into combustion air, which can cause fouling and plugging of furnace components.
- The temperature of the return air to the furnace is maintained between 55°F (13°C) and 80°F (27°C), with no evening setback or shutdown. The use of the furnace while the structure is under construction is deemed to be intermittent operation per our installation instructions.
- The air temperature rise is within the rated rise range on the furnace rating plate, and the gas input rate has been set to the nameplate value.
- The filters used to clean the circulating air during the construction process must be either changed or thoroughly cleaned prior to occupancy.
- The furnace, ductwork and filters are cleaned as necessary to remove drywall dust and construction debris from all HVAC system components after construction is completed.
- Verify proper furnace operating conditions including ignition, gas input rate, air temperature rise, and venting according to these installation instructions.

**▲ CAUTION**

**PERSONAL INJURY AND/OR PROPERTY  
DAMAGE HAZARD**

Improper use or installation of this furnace may cause premature furnace component failure.

This gas furnace may be used for heating buildings under construction provided that:

- The furnace is permanently installed with all electrical wiring, piping, venting and ducting installed according to these installation instructions. A return air duct is provided, sealed to the furnace casing, and terminated outside the space containing the furnace. This prevents a negative pressure condition as created by the circulating air blower, causing a flame rollout and/or drawing combustion products into the structure.
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**Warranty Coverage:** Gas furnaces used for temporary heat during construction that do not meet the above requirements are not covered under warranty.

**THIS WARRANTY DOES NOT COVER:**

1. Labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts, or replacement parts, or new units.
2. Any product purchased over the Internet.
3. Normal maintenance as outlined in the installation and servicing instructions or Owner's Manual, including filter cleaning and/or replacement and lubrication.
4. Failure, damage or repairs due to faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation.
5. Failure to start due to voltage conditions, blown fuses, open circuit breakers, or damages due to the inadequacy or interruption of electrical service.
6. Failure or damage due to floods, winds, fires, lightning, accidents, corrosive environments (rust, etc) or other conditions beyond the control of Company.
7. Parts not supplied or designated by Company, or damages resulting from their use.

## **Supplemental Information**

In general, manufacturers prefer gas furnaces not be used for temporary heat during construction for the following reasons.

- 1) Gas furnaces operating with a return air temperature below the specified minimum return air temperature can result in condensation in the heat exchanger and vent system. This can result in early corrosion failures.
- 2) The finishing phases of construction can expose the HVAC system to chlorides and other corrosive fumes. When combined with moisture, this is corrosive.

**State/Local/Utility Codes:** Some local/state construction and utility codes do not allow use of gas furnaces during construction regardless of the manufacturer's policy. CCS is obligated to comply with all local/state codes; therefore, CCS will not issue approval letters for use of a gas furnace for temporary construction heat in areas where code does not allow. Please become familiar with your local construction and utility codes.

**Inspections:** Some local construction codes require an inspection of the HVAC system by someone other than the installing dealer prior to owner occupancy. In general, the inspection ensures the ductwork and equipment is restored to like-new condition.

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