

## TUNNEL TOPICS

By Ken Williams



# Prepare for Stormy Weather

### Direct gas-fired heaters can solve heating, drying problems

If you're a carwash operator in sunny California, this story is probably *not* for you. But if your business is based in a part of the country that sees its share of snow, read on.

There are several ways to heat a carwash location during those cold winter months, and operators have their own preferences. One way carwash owners are keeping their facilities and their employees warm is with direct gas-fired air heaters. The heaters can be used for space heating as well as hot-air drying of cars.

#### Types of heaters

Direct gas-fired air heaters are efficient and provide a lot of heat because the burner fires directly in the air stream, rather than through a heat exchanger. This results in no wasted energy. One hundred percent of available BTUs are delivered to the heated space because there are no flue or heat-exchanger losses. They are used in a wide variety of commercial and industrial buildings for space (comfort) heating, tempering outside make-up air (ventilation) and process heating (drying) applications. But not all direct gas-

fired air heaters are alike and some are better suited for carwash applications than others. The following are some types of direct gas-fired air heaters:

*Make-up air heater.* This type of heater uses 100 percent outside air, low temperature rise, high cfm/low velocity and is a large unit with a draw-thru blower. Direct gas-fired heaters were originally used almost exclusively for make-up air heating (ventilation) applications. Even today, most direct gas-fired air heaters reflect this heritage because they are designed around a large draw-thru blower/burner configuration that moves a large volume of air through a low temperature rise that normally is less than 120 degrees. This is a great design for applications that need a large, constant volume of tempered make-up air for ventilation. However, it is not usually an efficient design for a carwash that needs primarily space heating or drying.

*Recirculating heater.* This heater is similar to the make-up air heater, but uses less than 100 percent outside air.

This approach takes the make-up air heater design and modifies it to recirculate

and reheat up to 80 percent of the building air. This is an attempt to be more efficient for applications that need both space heating and make-up air. However, the result is a design that does neither the best and is limited to a low temperature rise. Indoor air quality and heater longevity suffer because the moist, corrosive air is recirculated. This is probably not the best direct gas-fired air heater design for carwash applications.

*High-temperature heater.* This uses 100 percent outside air, has a high temperature rise, low cfm/high velocity and is a small unit with a blow-thru blower. This design provides high-velocity, high-temperature outlet air for both space heating and drying. It's characterized by a blow-thru configuration where the gas burner is located downstream from the blower. Therefore, the blower and other temperature-sensitive components, such as belts and bearings, are located upstream from the burner where they always stay cooler. This increases reliability and allows this construction to be certified for a much higher 160-degree temperature rise in space-heating applications. Designs are also available with discharge temperatures



over 200 degrees for car-drying applications. One hundred percent outside air is utilized for improved indoor air quality and longer service life. It also supplies more BTU/cfm than any other direct gas-fired system. That means it can heat a space or provide hot air for drying using the minimum amount of outside air. This keeps the blow-thru heater small and makes it more economical to operate. It requires a lower horsepower motor that results in lower utility bills than a larger draw-thru unit that would be required for a similar application. The high-velocity hot air generated by this design is ideally suited for use in carwash door heaters, space heaters, thermal air curtains and hot air dryers.

## Mounting configurations

Another big advantage of the high temperature rise blow-thru heater is that it can be mounted outside the harsh carwash tunnel environment. Therefore, it is easier to maintain than heaters mounted in the wet and corrosive carwash tunnel. It's great for carwash owners because it does not take up valuable equipment space inside the tunnel. Many mounting configurations are available to accommodate building aesthetics and space requirements.

## Space-heating applications

Direct gas-fired systems are used to heat both conveyor and rollover type carwashes from 40 feet to more than 200 feet in length. The thermal air curtain design with linear slot diffusers is a popular heating approach for carwash tunnels where the major heat loss is at the open doors. The objective of a thermal-air curtain is to blend sufficient heat to raise the inside air temperature of the

carwash and sufficient air velocity to provide a barrier to the outside cold air. This allows the carwash doors to remain open, which can speed up the car-per-hour rate. Open doors can also increase business on a cold day. Closed doors often keep customers away since it appears the carwash is closed.

Non-recirculating, high temperature rise, direct gas-fired heating offers the following benefits:

- The high Btu/cfm ratio gives increased heating capacity allowing the carwash to stay open on even the coldest days when other carwashes are forced to close. This means more business, more revenue and more profit.
- No recirculation of inside air improves indoor air quality. It also prevents corrosive chemicals from being ingested into the heater and that means less heater maintenance and longer life for the heater, other equipment and the building itself.
- It can eliminate icing problems associated with carwash equipment, brushes and floors. Icing can damage cars, create unsafe working conditions and even shut down the carwash on critical, busy winter days.
- It does the best job of eliminating fogging conditions in the carwash tunnel that create problems for drying equipment and can be dangerous for both customers and employees.

## Hot-air drying applications

Direct gas-fired heaters can economically supply hot air on demand for better and faster drying when outdoor temperatures drop below 65 degrees. They can be used to supplement an existing cold-air blower drying system with high temperature air that can exceed 200 degrees. In some cases, the same

direct gas-fired heating system can be used for both space heating and hot-air drying.

Direct gas-fired hot-air drying offers the following benefits to the carwash operator:

- Hot air dries cars far better than cold-air blowers thus reducing customer complaints and lost customers who are unhappy with their wet cars after going through the drying cycle on cool days.
- A hot-air system can reduce the required tunnel length devoted to the drying cycle, leaving more room for other "money-making" carwash operations.
- The carwash owner can significantly speed up his operation with hot-air drying, especially during cold winter months when customers are more willing to pay extra for a dry car.
- Expensive manual towel drying is eliminated or dramatically reduced with a hot-air drying system. This has many benefits, including a significant reduction in employee and towel laundry expenses. Staff scheduling problems often disappear because the heater will show up every day for work. Part-time employees are not that reliable, especially on cold winter days when they are most needed to hand-dry cars still wet after going through a cold-air drying cycle.

Heating a carwash tunnel is a tricky issue due to its dynamic environment. However when done right, it can have many benefits including a more-profitable carwash operation. ☎

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