
Why is 409 Stainless Steel the best choice for Outdoor Furnaces?

There is a lot of debate in the outdoor furnace industry about which steel is better to use and some companies put a lot of time and effort in to promoting their choice and speaking badly about other steels.

We have made our choice based on the value that is provided to the customer. This value is based on long life (corrosion resistance, ability to withstand high temperatures, thermal expansion), heat transfer and cost effectiveness.

Corrosion Resistance

Stainless Steel is stainless because it has chromium oxide film layered on the steel. This film keeps oxygen from penetrating and corroding the material (rusting). This is why you see mild (carbon) steel rusting while sitting out in the open. Mild steel will start slowly corroding away from the first day of it's use. This is why many mild steel furnaces are at least 1/4" thick (to try to give the more life span).

Heat Tolerance

This might be what really sets 409 Stainless Steel apart from other steels in outdoor furnaces. It far outperforms all others steels and gives the furnace a long life.

409 Stainless Steel can withstand continuous temperatures of up to 1400° F while no other steel used in outdoor furnaces can withstand anything over 800°F. This means that when the fire is over 800°F mild steel and 304 Stainless Steel begin to oxidize and break down causing material failure in the long term which means a shorter life span.

Heat Transfer

409 Stainless Steel has the best heat transfer capability of any stainless steel used in outdoor furnaces, having about 60% more heat transfer capability than 304 SS and a similar heat transfer capability to mild steel when factoring in the thickness of material necessary for mild steel furnaces.

Strength

Why are we able to use thinner material in our furnaces? Because 409 Stainless Steel was designed and developed for high temperature situations and to withstand corrosion.

Thermal Expansion/Warping

Again, 409 Stainless Steel outperforms all other stainless steels used in outdoor furnaces having a very low expansion rate and one that is similar to mild steel. This is why you will see furnaces made out of 304 Stainless Steel warp and spider crack often and be very hard to weld on. This is also why you can see our furnaces withstand a fire or burning low on water while other furnaces cannot.

Value Chart for Steels used in Outdoor Furnaces

| | Mild Steel | 409 SS | 304 SS |
|----------------------------------|------------|--------|----------|
| Corrosion Resistance | NO | YES | YES |
| Heat Transfer | GOOD | GOOD | NOT GOOD |
| Thermal Expansion | LOW | LOW | HIGH |
| Continuous Temperature Tolerance | 600-800° | 1400° | 800° |
| Cost | GOOD | GOOD | HIGH |