

## T304 vs. 409...It's all stainless, right?

NOT EXACTLY.

There *are* differences—and they should be factored into the decision to purchase an exhaust system. The four main variables your customers should be aware of include: corrosion resistance, temperature endurance, finishing quality and price.

T304 is classified as an austenitic stainless steel containing high levels of chromium and nickel content. The most corrosion resistant of the stainless group, this material contains approximately 18% chromium and 8% nickel.

Containing the lowest chromium content of all stainless steels, 409 stainless is considered a Ferritic grade. The least expensive, 409 stainless has been widely used within the automotive industry especially on exterior parts in non-critical corrosive environments.

According to the Specialty Steel Industry of North America (SSINA) chromium is “the alloying element that imparts to stainless steels their corrosion resistance qualities by combining with oxygen to form a thin, invisible protective film on the surface.”

Because of the differences in composition, T304 stainless provides superior resistance to the corrosive agents found in exhaust emissions and certain environments. Thus the characteristics of the region should, in part, dictate the ideal exhaust material. For example, localities with higher levels of salt exposure should lean toward a T304 system due to its ability to ward off deterioration.

Over time and exposure to extreme temperatures all stainless is prone to discoloration and loss of strength. While normal running exhaust gas temperatures (EGTs) range from 500-900° F, with vehicle mods and/or under a heavy load, EGTs can reach up to 1300°F.

The SSINA reports that loss of strength occurs in the 300 series stainless at about 1000° F and at about 800° F in the 400 series.

For those interested in the aesthetic features, the T304 material has mirror-like polishing capabilities. Whereas, 409 stainless typically has a matte finish.

The last point of difference is price. As mentioned earlier, 409 raw steel is significantly less expensive—savings which are apparent in price comparisons.

In summary, when stocking exhaust it is important to understand the differences in material grades and the needs of the end consumer.

### PROPERTIES OF STEEL GRADES

#### 300 Series:

- Non-magnetic
- Excellent corrosion resistance
- Good high and low temperature mechanical properties
- Can be polished to a bright mirror finish

#### “Non-Hardenable” 400 Series:

- Good corrosion resistance
- Magnetic
- Limited temperature use

Source: Specialty Steel Industry of North America, <http://www.ssina.com>