

What makes stainless 440C steel stainless? by Mike Mortensen - Director of Engineering RBI-USA

The term "stainless" is used to describe materials that do not develop oxide layers or rust. This allows the products made from stainless steel to be used in applications where exposure to moisture is expected.

440C stainless steel contains approximately 16% to 18% chromium. When exposed to air, the chromium molecules react with the oxygen to produce a thin layer of chromium oxide, which stays on the metal surface. This process is called passivation and occurs quickly. Therefore, if the metal surface is scratched, a new chromium oxide layer develops immediately and the metal surface remains protected.

These oxide atoms are similar in size to the chrome atoms, allowing for them to be packed tightly with each other. By being tightly packed, the layer is very stable and cannot be penetrated by water. If water cannot reach the iron atoms, then rust corrosion will not occur.

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