

“Only the best”

*“Contributing to our stainless steel manufacturing customers’ success by helping them work better”*

## STAINLESS STEEL GRADE IDENTIFICATION

*Know what you are dealing with...*

Number: 2011/001

### Real World challenge:

Using the wrong type of stainless steel can translate into huge cost for the fabricator as end-user complaints regarding the presence of rust or degradation could arise. Corrosion properties of stainless steel grades are not all the same and each grade should be seen as application specific. Therefore, choosing a grade is something that has to be done thoroughly. Before starting a new project, it is essential to understand the kind of environment the stainless steel will be exposed to. For example, flash rusting of 400 grade after treatment with chemicals that are not harmful to other types of stainless steel is a common mistake. Therefore, the use of proper tools and techniques for machining, welding or cleaning this alloy has to be considered. Also, 316 grade is favored over 304 in environments where aggressive solutions (strongly acidic or alkaline) are in contact with the workpiece since its corrosion resistance is better. That is why serious stainless steel fabricators need to ensure that they are using the most suitable alloy for the job at hand.

Because it is visually impossible to differentiate 200, 304, 316 and 400 grade stainless steel, Walter provides a test kit (PN: 54T001) that allows customers to instantly identify the grade of stainless steel.

### Technical Background:

There are countless types of stainless steel. They are mainly regrouped in 3 categories or grades: 200, 300 and 400. Each grade has its own specific properties directly linked to its chemical composition. Type 304 and 316 are the most commonly used alloys in industry. The main difference between the two being the addition of Molybdenum (Mo) in 316 grade. The addition of Mo increases the corrosion resistance of this alloy. The main difference between 200 and 300 grade is the higher percentage of Manganese (Mn) in the 200 grade family of alloys.



Probe and Molybdenum reagent. The Manganese reagent is inside the probe. Current is passed through the chemical solution which reacts with the surface colouring the test papers depending on the composition of the alloy.

Walter’s innovative electrochemical test kit allows for fast and accurate differentiation between 200, 400, 304 and 316 grades of stainless steel. Test results can easily be interpreted as they are based on color or magnetism. 400 grade being the only grade that shows magnetic properties. The magnetic tip of the test probe comprised in the kit allows the user to quickly notice the presence of this alloy. Two different chemical reagent tests are subsequently used to identify 200, 304 and 316 grades: a Manganese detection test and a Molybdenum detection test. The result of this test is instantaneous and easy to interpret since it is colour based.



Red coloration of the test paper after probing indicates that the sample is 316 grade stainless steel. Surface has to be cleaned after the test as a deposit may be left behind.

Identifying the type of stainless steel is envisioned as being part of an unambiguous quality assurance policy that both fabricators and end-users can implement. Fabricators can add value and professionalism to their approach by guaranteeing their work while end-users can make sure that what has been delivered is what they asked for.

#### **About the author:**

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#### **About WALTER:**

Walter Surface Technologies has been a leader in the surface treatment technologies for more than 50 years, and has been providing high productivity abrasives, power tools, tooling, chemical tools and environmental solutions for the metal working industry. Founded in Montreal, in 1952, Walter Surface Technologies is now established in 7 countries in North America, South America and Europe. For additional information: [www.walter.com](http://www.walter.com)

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