

MACSTEEL VRN

STAINLESS STEEL PLATE, SHEET & STRIP

Identification of surface finish

Standard mill finishes produced on flat rolled products

HOT ROLLED FINISHES

No 0 finish

Also referred to as hot rolled annealed (HRA). This plate is hot rolled to required thickness and then annealed. No pickling or passivation operations are effected, resulting in a scaled black finish.

This does not develop the fully corrosion resistant film on the stainless steel and, except for certain high temperature heat resisting applications, this finish is unsuitable for general use.

No 1 finish

Plates is hot rolled, annealed, pickled and passivated. This results in a dull, slightly rough surface, suitable for industrial applications which generally involve the range of plate thicknesses. Grinding marks may be visible in isolated areas. Material with HRA and No 1 finish is supplied ex mill in 3 mm - 50 mm thickness.

COLD ROLLED FINISHES

The starting material for cold rolling always has a No 1 finish. Cold rolled material is supplied with the following standard mill finishes:

No 2D finish

Material with a No 1 finish is cold rolled, annealed, pickled and passivated. This results in a uniform dull matt finish, superior to a No 1 finish. Suitable for industrial application and eminently suitable for severe deep drawing as the dull surface (which may be polished after fabrication) retains the lubricant during the drawing operation.

No 2B finish

Material with a 2D finish is given a subsequent light skin pass cold rolling operation between polished rolls. A No 2B finish is the most common finish produced and called for on sheet material. It is brighter than 2 and is semi-reflective. It is commonly used for most deep drawing operations and is more easily polished to the final finishes required that is a 2D finish. Material with 2D and 2B finish is supplied ex mill in 0.5 mm - 3 mm thickness.

No 2BA finish

This is more commonly referred to as a bright annealed (BA) finish. Material with a No 1 finish is cold rolled using highly polished rolls in contact with the steel surface. This smooths and brightens the surface. The smoothness and reflectivity of the surface improves as the material is rolled to thinner and thinner sizes. Any annealing which needs to be done in order to effect the required reduction in gauge, and the final anneal, is effected in a very closely controlled inert atmosphere. No oxidation or scaling of the surface therefore occurs and there is no need for additional pickling and passivating. The final surface developed can have a mirror type finish similar in appearance to the highly polished No 7 and No 8 finishes. Material with BA finish is supplied ex mill in 0.5 mm - 1.6 mm thickness.

MECHANICALLY POLISHED FINISHES

The following finishes are all mechanically produced polished finishes. As well as being standard mill finishes, they are also applied to stainless steel articles and components to meet the required aesthetic criteria. It should be appreciated that factors such as hand polishing vs mechanical polishing, polishing a flat product as against a component of complex shape and thickness and composition of material can affect the visual appearance of the final surface.

No 3 finish

This is a ground unidirectional uniform finish obtained with 80-100 grit abrasive. It is a good intermediate or starting surface finish for use in such instances where the surface will require further polishing operations to a finer finish after subsequent fabrication or forming.

No 4 finish

This is a ground unidirectional finish obtained with 150 grit abrasive. It is not highly reflective, but is a good general purpose finish on components which will suffer from fairly rough handling in service (e.g. restaurant equipment). Material with No 4 finish is supplied ex mill in 0.5 mm - 3 mm thickness.

No 6 finish

These finishes are produced using rotating cloth mops (tampico fibre, muslin or linen) which are loaded with abrasive paste. The finish depends on how fine an abrasive is used and the uniformity and finish of the original surface. The finish has a non directional texture of varying reflectivity. Satin blend is an example of such a finish.

No 7 finish

This is a buffed finish having a high degree of reflectivity. It is produced by progressively using finer and finer abrasives and finishing with buffing compounds. Some fine scratches may remain from the original starting surface.

No 8 finish

This is produced in an equivalent manner to a No 7 finish, the final operation being done with extremely fine buffing compounds. The final surface is blemish free with a high degree of image clarity and is the true mirror finish.

Note: The finer polished finishes (No 4, No 6, No 7, and No 8) are generally only produced one side of the sheet, the reverse side being either a No 2B or No 3 finish.

Surface roughness

The surface roughness can be measured, and is usually expressed as an Ra value in microns (mm). This is the arithmetic mean of the departure of the peaks and valleys of the surface profile from the mean centre line over several sampling lengths, and is therefore also termed the Centre Line Average (CLA). The standard surface finishes on stainless steel cannot be directly equated to an Ra value as a guaranteed exact value, as the actual values will depend on several factors.

These include:

- The reduction in thickness by cold rolling and the smoothness of the rolls used for such cold rolling.
- The grade and shape of the abrasive used
- Wheel vs belt polishing
- Hand vs machine polishing
- Contact pressure
- Polishing speeds

- **The grade of material being polished.**