Cold-Rolled Strip Steel: Defining Requirements Improves the Bottom Line

To ensure the material provided is the best fit for the application, consider sharing as much information regarding the intended application as possible.
Cold-rolled steel is commonly utilized in appliance design as it offers both a wide range of physical property and surface finish options. And, while engineers often have a selection process that’s tried and true, there are a few things to consider the next time you source cold-rolled strip steel from your manufacturing partner.

**Fully Define Your Expectations**

When reviewing the material needed for an application, consider all aspects of how the material will be utilized and what parameters need to be defined to ensure that the supplied product is both consistent and will allow for successful production of the component. In many instances, only a limited number of parameters are defined when inquiring a material with a source mill. This can lead to inconsistencies in how the material is produced and ultimately supplied, which unfortunately can result in negative impacts in the overall cost to produce a component. To help ensure the material provided is the best fit for the application, consider sharing as much information regarding the intended application as possible. This will help define what parameters need to be fully defined and also opens up an opportunity for the source mill to offer material suggestions that can lead to potential improvements in the end product and/or the overall cost to manufacture.

**Collaborate with the Mill**

Look for a mill partner willing to collaborate with you. By sharing information regarding the intended application(s), the mill’s experts will be able to provide suggestions/recommendations regarding the appropriate grade, temper, finish, surface protections, etc. for the application. Most mills are more than willing to offer their technical assistance in this regard, which can result in direct positive impact on the bottom line.

Note: If there is a concern regarding proprietary information associated with how the material is to be utilized, a good mill partner will consent to sign a non-disclosure agreement, legally binding them from sharing information deemed as proprietary.
Request a Sample

Many appliance OEMs and manufacturers may not realize that they can request a sample. This can help ensure the defined properties of the material will meet the needs of the application. As an example, available surface finish options vary by facility. Requesting samples during the mill partner selection process can assist you with performing direct comparisons of the products being offered.

Consider the Entire Application

When sourcing material, it is important to consider all material parameters, in addition to the surface finish. How the steel will be both processed and utilized in its final form can have an impact on both the grade of steel and the associated temper. Refining of these parameters can lead to greater part to part consistency, improved part finish and reduced finishing after stamping.

As an example, if the steel will be used in an application that requires a certain level of stiffness or functionality, a product with increased hardness, a higher level of carbon or possibly even a HSLA (High Strength Low Alloy) product may be the best fit. If the application requires extreme manipulation/distortion of the material, a product with a restricted harness, carbon level and possibly a micro-alloying addition may be more appropriate to improve the properties of the finished component. These parameters, along with intended component orientation during stamping and drawing can all have distinct impacts on the finished components and subsequently, the bottom line.

Defining the Requirements

Grade – for most appliance applications, a standard low carbon 1008/1010 product is an ideal fit, providing good form, function and finish properties. However, consider how the material will be processed and the end use; it may be advantageous to discuss alternate materials with the source mill that may improve processing efficiencies or the end product.

Temper – typically a DQ (drawing quality) product fits most applications, however for designs that require greater stiffness, it may be appropriate to explore CQ (commercial quality), ½ hard or even full hard material. Conversely, for designs that require notable material manipulation, deep drawn components as an example, DDQ (deep draw quality) or even EDDQ (extra deep drawing quality) materials may be a better fit to improve part consistency and post process finishing.

Finish – for unexposed, non-deep draw applications, a standard #2 commercial bright finish typically provides the best compromise between performance and overall cost. For applications that require heavy working of the material, a #1 matte finish, applied via shot blast, EDT or LaserMatte process is typically is a better fit. For exposed, decorative surfaces, there are a number of options varying from #3 appliance and #2 best bright finishes, which have highly refined, mirror like surfaces, to brush and embossed finishes that can provide unique textured finishes (pebble, leather, etc.).

Define Reporting Requirements
As you collaborate with your mill partner, request testing be performed to ensure the material conforms to the stated requirements. Requiring certified test reports typically will not impact processing time or cost, but help to ensure the consistency of the product being provided and make for an excellent reference to further refine future purchasing parameters.

**Overall Cost of Production**

A number of parameters impact the overall cost of product of a component, including not only the raw material cost, but also the processing steps involved to produce an item and the associated fall out. For decorative/exposed applications, post stamp processing costs can vary greatly based on the material utilized. Depending on the shape and finish, some materials require more post stamping production time and manual labor than others. Robotics can be utilized in some applications to reduce cost and quicken the process. However, robotics may not be able to be used if the component has an intricate shape that results in the need to hand finish. After stamping, a raw material with an improved surface finish can result in a decrease in the time/expense spent on this part of the operation. While material with more highly refined finishes is typically more expensive to procure, the overall improvement it can provide to production processing cost, consistency and part fall out should be considered as it is typically found that the savings gained in processing will outweigh the premium associated with a more highly refined surface.

**Reduce the Potential for Damage**

Once the parameters for the material produced are defined there are still additional parameters that should be considered to ensure that the material is received and is able to be processed in a manner that does not require additional finishing. For refined and embossed finishes, consider paper interleave to eliminate the potential for marring of the surface during payoff to the press. For #2 Best Bright and #3 Appliance finishes, consider adhesive plastic interleave that can be left on the material through the stamping operations as a protective layer, to be removed by the plater.

Define the packaging parameters to ensure the material arrives safely and is conducive to processing at your facility. If you need enhanced shelf life, consider requiring VCI (vapor corrosion inhibitor) shroud or stretch wrap on the finished skids.

Consideration of the above, along with keeping lines of communication open with suppliers, will help ensure that you receive a superior product, best fitted to the needs and specifications of your process and application.

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