

What Does the Term “Suitable for Coil Coating” Mean?

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Coil Coating facilities may have similar, yet, at times, very different processes that enable them to produce materials to meet the needs of our customers. For example, some coaters may have multiple cleaning, brushing, rinsing and treating stages as well as pre- or post-tension leveling within their coating lines. These multiple stages may allow them to process metal coils that other coaters who have single stages of cleaning, rinsing, treating and coating may not be able to run.

Customers should investigate the capabilities of coaters and mills or service centers before selecting a partner and should match those capabilities to the needs of their specific applications.

Due to fluctuating availability, metal is being secured anywhere and everywhere to meet customer demand. Problems with metal procurement brought this situation to the forefront of issues to resolve as a team.

Listed below are some suggestions to assist you in developing metal targets for a successful product. If you require a material that must conform to an ASTM or other published industry standard, be sure to specify this requirement on your specification or purchase order.

Substrate:

- Determine the capability of your coater to process coils.
- Most metal products are manufactured to meet an ASTM or other published industry standards.
- Most mills will know the capabilities of the coaters with whom they have experience, but it is best to define and quantify the requirements on critical applications.
- In the case of coated metals, such as zinc and zinc alloys (iron or aluminum), there are requirements for weight, thickness, adhesion and appearance. These requirements are found in ASTM or other published industry standards.

Shape:

- Terms such as “flatness critical”, “no edge wave”, “no center buckle”, “no camber”, etc. are not typically achievable or quantifiable. However, there are available ASTM and other published industry standards to quantify expectations.
- The best practice would be to develop a mutual agreement with the mill and the coater and, if necessary, level material during the blanking process to achieve flatness.

Surface Cleanliness:

- Hot rolled steel and cold rolled steel appear to have the most frequent issues with cleanability and treatability. These issues occur primarily due to elevated volumes of surface carbon that may be caused by mill rolling practices, annealing practices, and oils that have congealed, degraded, aged or contain large quantities of oxidized wax.

- Numerous studies have been conducted over the last 30 years to determine if steel is clean enough to process at a coater in order for the coater to achieve optimum metal treatment, coating adhesion, and flexibility. Two of the more common testing practices were developed, refined, or adopted in the 1970's:
 1. Dr. Phil Coduti at Inland Steel Research developed / refined the Coulometric method. The original target set for Zincrometal was 0.9 milligrams of total surface carbon maximum per square foot.
 2. Dr. Hospadaruk, Principal Scientist at Ford, adopted the (HCI) LECO-46 combustion method and the target for clean metal was set at 0.65 milligrams of carbon maximum.
- There are other variations of cleanliness such as the acid strike test used in combination with the LECO methods by some mills. This test is also conducted at various stages of the process.
- A large metal treatment supplier to the coil coating industry has used the Coulometric method for many years. It has targeted 1.0 milligrams of surface carbon as a maximum for metal to be considered clean for its product lines.
- This same company is currently running correlative studies between the Coulometric Model UIC 5011, <http://www.p2pays.org/ref/06/05827.htm>, and LECO Model RC 412, <http://www.leco.com/inorganic/carbon-sulfur/rc-412.htm>.
- The analytical tests mentioned above are normally performed by the mill or by the metal treatment supplier. They typically are not considered to be tests performed by the coil coating facility during production; therefore, it is best to attempt to clearly understand all substrate requirements and to mutually agree on metal substrate quality with your supply chain.

Treatments, Oils and Passivates:

- Most of the coil coaters will require that metal is not pre-treated by the mill unless the pre-treatment is something the coater has tried and proven successful on its own lines.
- Some chrome treatments have been successful, and many have not. It all depends on the individual coil coater.
- Most coil coaters will request light oil and no chemical treatment.
- There are industry standard oils used in the USA. If there is any question about the ability of the coater to remove an oil, or if the oil is coming from abroad, the best thing to do is to get a sample to the coater so its treatment supplier can test the material for cleanliness and treatability.

Edge Sealers:

- Most coil coaters will not accept coils with edge sealers.

Holes and Welds:

- Most coil coaters will not accept holes or welds.

Edge breaks, saw tooth edge, and edge burrs:

- Most coil coaters will not accept saw tooth edges. Also, coaters do not like to have edge burrs in excess of 0.003" as both conditions will cut coating rolls. Burrs should be burr face down rather than face up.