

Case Study

Advancing Door Frame Manufacturing in India with Precoated Steel

The construction industry in India has made remarkable strides by incorporating innovative materials to enhance building components. Among these materials, precoated steel, also known as prepainted steel, has emerged as a superior alternative to traditional options for door and window frames manufacturing. To overcome the challenge, renowned coil coatings manufacturer Beckers India, a joint venture with Berger Becker collaborated with leading prepainted steel producers.

Project overview

In India, conventional door frames made of wood or mild steel faced limitations such as termite vulnerability and susceptibility to corrosion. To address these challenges, the search for an advanced material led to the approval of precoated steel.

Project challenges

Challenges in manufacturing door frames using precoated steel arose from the thickness of the material, requiring the development of specialized coil coating paints to improve flexibility and prevent

peeling. Additionally, the paint used for the door frames had to meet RoHS environmental standards, emphasizing the importance of sustainable practices. The joint efforts resulted in the development of a high-quality, flexible, and sustainable paint solution tailored to meet the specific needs of precoated steel door frame manufacturers in India.

Product overview

The door frames constructed with precoated steel, were treated with a coil coating paint system called Regular Modified Polyester, available in distinct colours such as RMP RAL 5012 and RMP Appliance White for example.

Two types of coatings were developed for this application :

- Unicoat Topcoat (No primer) - 12 to 15µm thick topcoat applied directly without primer.
- Two Coats RoHS Compliance - Consisting of a 3-5µm thickness Chrome Free Primer followed by an 18-20µm thickness topcoat.

The Two Coat paint system exhibits higher corrosion resistance and excellent mechanical properties,

while the Unicoat system has slightly lower corrosion resistance but still possesses good mechanical properties. Both paint systems have been well-received in the market, catering to different target market segments, namely the premium and general markets.

Solutions offered

The exceptional characteristics of precoated steel that influenced its selection for door frame manufacturing include the following:

- High Thickness Range of Steel: Precoated steel offers a thickness range of 0.6 mm to 1.8 mm, providing improved structural strength and durability for door frames.
- Exceptional Flexibility (1T/2T): The outstanding flexibility of precoated steel allows precise shaping and bending during the door frame manufacturing process, ensuring flawless profiles.
- High Scratch Resistance (Scratch hardness > 1.5 Kg) : The paint system used on precoated steel exhibits remarkable scratch-resistant properties, maintaining the aesthetics of the door frames and protecting them from wear and tear.
- Corrosion Resistance (Salt Spray >500 hrs): Precoated steel demonstrates exceptional resistance to corrosion,

even in harsh environmental conditions, resulting in long-lasting performance. Developing a RoHS-compliant paint system suitable for precoated steel door frames presented a significant challenge.

Additionally, operating coil coating at such high steel thickness required meticulous attention to ensure smooth operations on the color coating line.

Rigorous trials and meticulous testing validated the efficacy of the specially formulated paints in enhancing flexibility and adhesion of the precoated steel door frames. The products secured compliance with stringent quality standards and sustainability requirements, establishing their suitability for diverse construction projects.

Leading Coil Coating Steel manufacturers are delighted to have created a new market segment in the coil coating industry. They have provided a better product and solution to the door frame industry in India. Homeowners expressed delight in the durability and aesthetic appeal of their new homes' door frames. The project's adherence to sustainable practices and timely completion garnered commendation from satisfied customers.

Conclusion

India's construction industry has embraced technological advancements with precoated steel as a top choice for door frame manufacturing. This material overcomes challenges related to steel thickness, flexibility, scratch and corrosion resistance, and RoHS-compliant paint. Successful coil coating and color coating line operations highlight the role of industry partnerships in innovation. The adoption of eco-friendly, durable, and attractive precoated steel frames reflects India's commitment to sustainable development and positions this material as a promising global solution for modern door frame manufacturing.