

How to weld angle iron for cable trays



Overview

Cable trays are not raceways, but they are treated as a structural component of a facility's electrical system.

Key Takeaways

Welding angle iron for cable trays requires proper joint preparation, precise alignment, and the right welding technique to ensure strong, durable, and square connections. Preparation and Tools

Before welding, clean the angle iron thoroughly to remove mill scale, rust, or oil using an angle grinder with grinding wheels or flap discs (60–80 grit) to prevent porosity in the welds . Clamping is essential: use C-clamps, locking pliers, and magnetic welding squares to hold pieces in place and maintain alignment during welding . For larger projects, a welding table with hold-down clamps can save time and improve accuracy.

Joint Types

For cable tray frames, the most common joints are:

- Butt Joint: Simple, but requires careful alignment to stay square .
- Miter Joint (45° cuts): Provides a clean look and distributes stress evenly, but precise cutting is necessary .
- Coped/Notched Joint: Strongest for structural frames; one piece is notched to nest the other, increasing weld surface area and stability .

- Lap Joint: Overlapping pieces create a natural shelf for the weld bead, forgiving for beginners and effective for weight distribution .

Welding Techniques

The choice of welding method depends on the thickness of the angle iron:

- MIG Welding (GMAW): Fast and suitable for most DIY projects, especially for thinner angle iron below 1/4 inch .
- Stick Welding (SMAW): Ideal for thicker angle iron above 1/4 inch or outdoor work where shielding gas may be blown away .
- TIG Welding (GTAW): Best for thin angle iron below 1/8 inch, providing precise, high-quality welds with minimal distortion .

Welding Process

- Tack Weld First: Place small tack welds on opposite sides of the joint to lock the pieces in place and prevent warping .
- Check Alignment: Ensure the angle iron remains square before completing the weld.
- Lay Final Beads: Weld in short sections, alternating sides if possible to minimize heat distortion .
- Allow Cooling: Let the metal cool gradually to reduce warping and maintain structural integrity.

Safety Considerations

Always wear a welding helmet with proper eye protection, gloves, and protective clothing. Ensure proper ventilation to avoid inhaling fumes, especially when welding galvanized steel . Sparks can cause burns or fires, so keep flammable materials away from the workspace.

Additional Tips

- Cut angle iron to precise lengths using a chop saw or angle grinder for clean, perpendicular cuts .
- For cable trays, ensure welds are continuous and strong enough to support the weight of cables and any additional load.
- Practice on scrap pieces to perfect your technique before welding the actual tray frame. By following these steps, you can create strong, square, and durable angle iron frames suitable for cable trays, ensuring both structural integrity and a professional finish .

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