

Engineering Note: EN0042 Hydro-Probe Orbiter Support Bar-Recommended Materials

Summary: Recommendations for different steels for the square support bar required to hold the Hydro-Probe Orbiter sensor inside a mixer.

Products affected: Hydro-Probe Orbiter (All Models)

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Summary

When using a Hydro-Probe Orbiter inside a mixer (as indicated in the relevant Hydro-Probe Orbiter user guide), it should be mounted using a 25-35mm steel square bar welded to a scraper arm, mixing blade or to the side wall of the mixer.

Due to the nature of the installation, these bars are subjected to severe and continuous vibrations which can contribute to fatigue at the welds. This, in combination with the welding method used and welding location, can degrade the strength of the bar and in the worst case scenario could cause complete failure at the weld whilst the mixer is running.

The choice of steel and welding method can improve overall strength of the weld to provide a secure fixing in these harsh operating conditions.

Recommended Steels for Improved Welds

1. **Low carbon steels** (with a carbon content between 0.2-0.3%)
AISI series C-1008 to C-1025 are examples for these types of steels according to the British Standards.
2. **Low alloy steels.**
AISI series 2315, 2515, and 2517 are examples for these types of steels according to the British Standards.
3. **316 or 304 stainless steel.**
4. **Nitrided steels.**
5. **C45 steel** can be used if special consideration is taken during the welding process. The welding process is:
 - Conduct the welding under Hydrogen + Argon (or Nitrogen).
 - Preheat the components to 120°C.
 - Heat-treat the weld and components using any conventional heat treatment for steel.