PANDA
CARBIDE
TECHNOLOGY CO.,LTD.

Technical Checklist: Brazing Tungsten Carbide to Steel Backing
Ensuring a Failure-Free Bond for Heavy-Duty Machine Liners

Phase 1: Pre-Brazing Verification

- Surface Cleanliness: Are both carbide and steel surfaces free of oil, rust, and scale? (Use industrial degreaser).

- Gap Optimization: Is the joint gap between 0.05mm and 0.15mm to allow optimal capillary action?

- Flux Application: Is a fresh, high-temperature fluoride flux applied evenly to prevent oxidation during heating?

Phase 2: Common Issues & Solutions

Problem observed	Potential Root Cause	Corrective Action
Hairline Cracks	Rapid cooling or thermal shock.	Use slow-cool media (vermiculite/sand) for 4–6 hours.
Porous Joint (Voids)	Insufficient flux or overheating.	Re-clean surfaces; ensure flux is active throughout the cycle.
Poor Wetting	Surface contamination or low temp.	Increase induction time; ensure steel reaches 700°C.
Carbide Detachment	Excessive residual stress.	Switch to "Sandwich" (Silver-Copper-Silver) tri-metal shims.

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Problem observed	Potential Root Cause	Corrective Action
Oxidized Edges	Over-torching/Atmospheric exposure.	Shield with argon gas or reduce heating duration.

Phase 3: Quality Inspection

- Visual Check: Does the braze alloy show a continuous, smooth fillet around the entire perimeter?

- Sound Test: Does a light tap with a brass hammer produce a solid "ping" (good bond) or a dull "thud" (void)?

- Alignment: Is the plate perfectly flush? (Uneven plates lead to premature chipping in high-flow environments).

Expert Tip from Panda Carbide:

"Always remember: TRS (Transverse Rupture Strength) is compromised if the brazing temperature exceeds 850°C. Precision temperature monitoring is your best defense against premature liner failure."