On-Site Open-Ended Belt Field Splicing & Hot-Vulcanization SOP

370°C PTFE Heat-Welding Press, FKM / Silicone / EPDM Vulcanization & Cold-Bond Schedules, Bolster Closure & Field Seam QA

1. Scope & Pre-Splice Site Preparation Requirements

OPEN-ENDED BELT REPLACEMENT

- **Application:** Used where existing ductwork cannot be separated to slide on an endless factory-spliced belt; supplied open-ended with factory-prepared step-lap ends.
- **Environment:** Establish a clean, dry, dust-free shelter around the splice table; ambient temperature **≥ 10°C** and relative humidity **≤ 75% RH**.
- **Surface Prep:** Thoroughly degrease splice zones with isopropyl alcohol (IPA) or acetone to remove ash/oil; lightly buff elastomer mating faces prior to priming.
- **Seam Placement:** Position the finished field splice along the **top flat run** (≥300 mm away from rectangular corners) and strictly clear of bottom acid condensate zones.

2. Step-Lap Splice Geometry & Heated-Platen Press Zone

50–75 mm OVERLAP

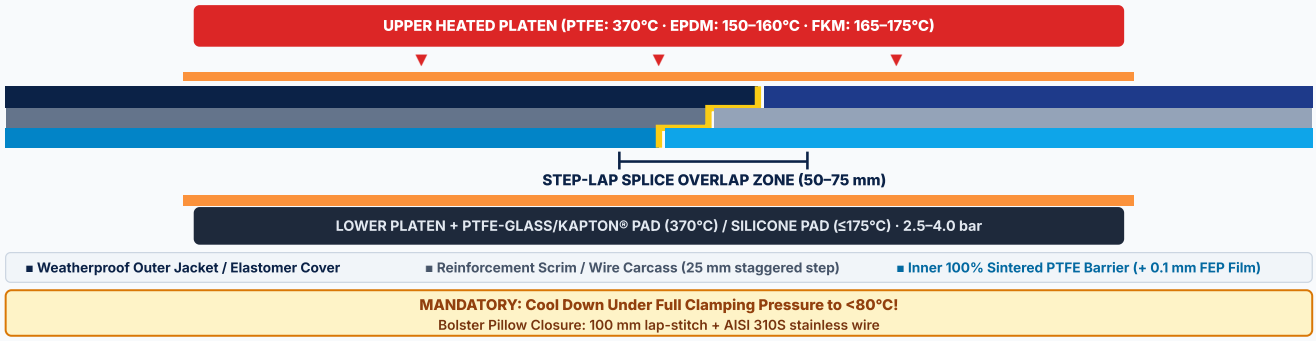

Figure 1 — 25 mm staggered step-lap geometry, 0.1 mm FEP fusion film, heated platen clamping zone, and mandatory <80°C pressurized cool-down.

3. 370°C PTFE Heat-Welding Press Parameters

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Process Parameter	Target Setting	Tolerance & Critical Quality Control
Splice Overlap Width	50 – 75 mm	Stagger individual layers by 25 mm step-lap to avoid thickness buildup at flange clamping bars.
Interlayer Fusion Film	0.10 mm FEP	Insert clean virgin FEP bonding film across the full width between sintered PTFE mating surfaces.
Upper & Lower Platen Temperature	370°C	±10°C closed-loop PID control; verify both platens with calibrated independent thermocouples.
Clamping Platen Pressure	2.5 – 4.0 bar	Use **PTFE-coated fiberglass, Kapton® polyimide, or aramid heat-resistant pressure pads** + PTFE release sheets on both sides (NEVER use silicone pads at 370°C; silicone pads are strictly reserved for Sec. 4 150–175°C FKM/EPDM vulcanization).
Soak / Dwell Time at 370°C	6 – 10 min	Scale by total belt thickness: 6 min for ≤2 mm; 8–10 min for 2–4 mm multi-ply builds.
MANDATORY Pressurized Cool-Down	< 80°C	**NEVER release platen pressure until splice cools below 80°C** (early release causes blistering & delamination!).

48-Hour Emergency Turnaround & 24/7 Senior Engineer Hotline: **+90 530 675 18 99 · Tel: +90 212 823 37 57 · info@bundletec.com · www.bundletec.com/en/**

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4. FKM / Silicone / EPDM Hot-Vulcanization & Cold-Bond Cure Schedules

ELASTOMER SPLICE RECIPES

Elastomer / Jacket	Splice Method	Platen Temp	Pressure	Dwell / Cure Time	Key Control & Cool-Down
FKM (Viton® ≤204°C)	Hot Vulcanization	165–175°C	3.0–4.0 bar	25–35 min	3 mm silicone pad + uncured FKM gum + primer · Cool <70°C under press.
EPDM (≤135°C)	Hot Vulcanization	150–160°C	2.5–3.5 bar	20–30 min	3 mm silicone pad + uncured EPDM tie-gum · Cool <70°C under press.
Silicone VMQ (≤240°C)	Hot Press / RTV	145–160°C / Amb.	2.0–3.0 bar	20 min / 24 h RTV	High-temp RTV silicone adhesive requires full 24h cure
Emergency Cold-Bond	2K Elastomer Adhesive	15–30°C	Stitch roller	Min. 24 h full cure	Mandatory 24h ambient cure before tensioning or hot startup

5. High-Temp Bolster Pillow Closure

- Overlap both ends of the 1200°C REACH CMS-Bio ceramic bolster pillow by a minimum of **100 mm lap** across the full width.
- Lace the overlap continuously using **AISI 310S (1.4845) or Inconel 625 stainless wire** at ≤25 mm stitch pitch with zero thermal gaps.
- Shingle internal wire-reinforced silica and SAPB/DAPB particulate layers in the direction of gas flow so upstream edges shield downstream overlaps.

6. Field Seam Quality Assurance (QA)

- **Spark / Holiday Test:** Scan non-conductive sintered PTFE seams at 3–5 kV/mm for zero pinholes (**exclude ATEX conductive black PTFE Rs < 10^6 Ω** and wire-mesh-backed zones — use EN 1593 Nekal® vacuum-box check instead).
- **Vacuum-Box Soap-Bubble Check:** Apply Nekal® / bubble solution along the splice under ≥50 hPa vacuum box (EN 1593 principle) — zero bubbles permitted.
- **Visual & Coupon Peel Check:** Verify zero blistering, uniform thickness across clamping edges, and full bond integrity on sacrificial edge strip.

7. SITE SAFETY, PPE & VENTILATED FLANGE INSULATION RULE: Maintain **forced local exhaust ventilation** during 370°C PTFE welding (never overheat PTFE above 380°C; strictly no smoking; heat-resistant gloves & eye protection mandatory). After clamping the spliced belt (3-pass torque + mandatory 24h hot retorque), **external duct insulation MUST stop at the flange root — leave clamping bars and outer belt completely exposed and ventilated!**

24/7 Arnavutköy Field Engineering & Portable Press Dispatch: BundleTec certified field technicians mobilize worldwide with portable 370°C PTFE heat-welders and FKM/EPDM vulcanizing presses for planned outages and emergency shutdowns. Direct hotline: **+90 530 675 18 99** · **+90 212 823 37 57** · **info@bundletec.com**.