

## CAD Passed, Coating Jammed the Fit

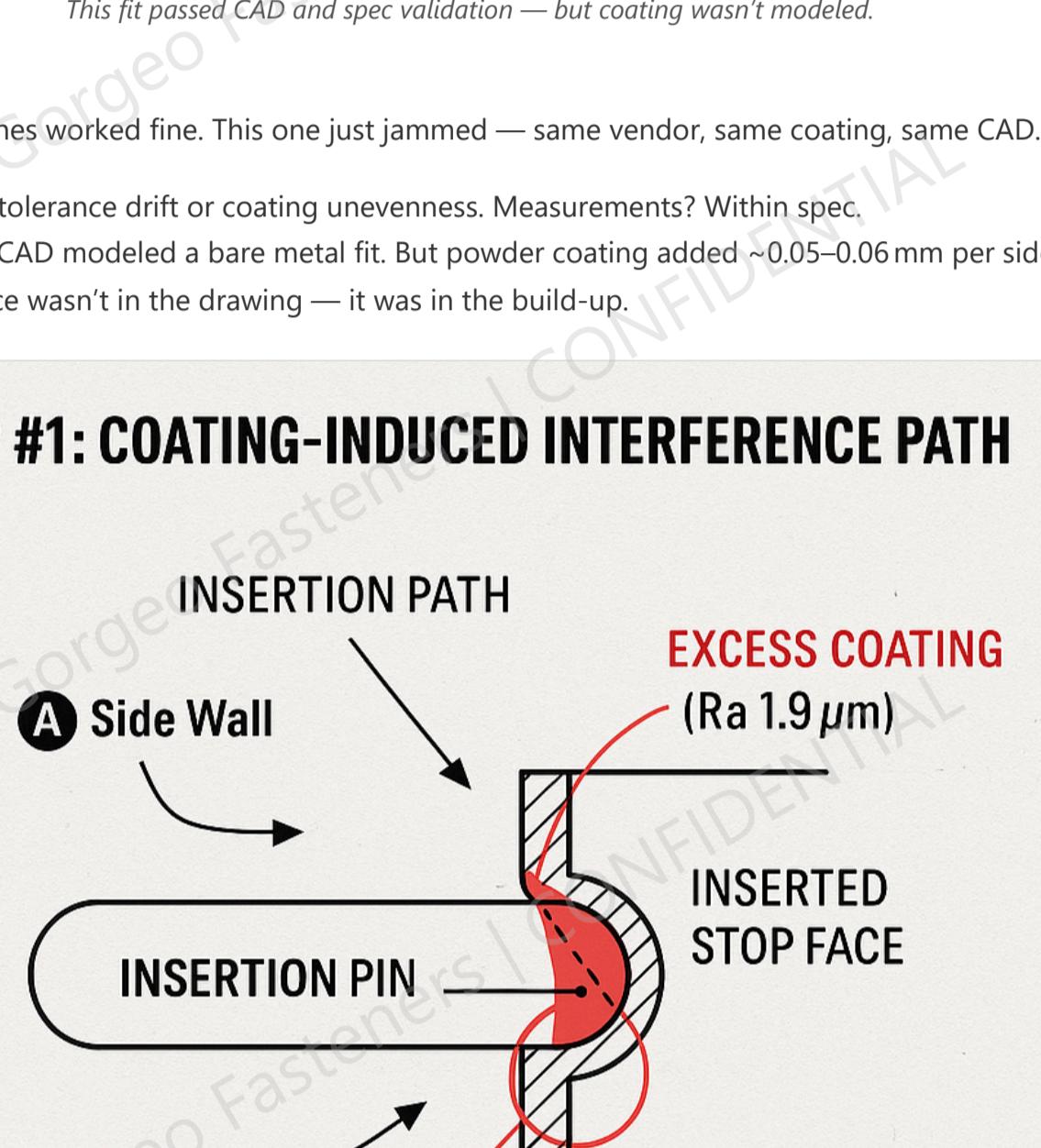
### ► Executive Summary

This report dissects a coating-induced jamming event, where a powder-coated fit passed CAD review but jammed during press-fit assembly. Despite using the same vendor and spec, the coating layer caused interference not accounted for in the original drawing, revealing a blind spot between design intent and real-world build-up.

Product	Core Issue	Line Stoppage
<b>Powder-Coated Interference Sleeve</b>	<b>Coating-Induced Interference</b>	<b>~ 0.08 mm Jam Fit</b>

### ► Autopsy Report (Dynamic Path Misfit)

#### CAD INSERTION FIT - NORMAL STATE



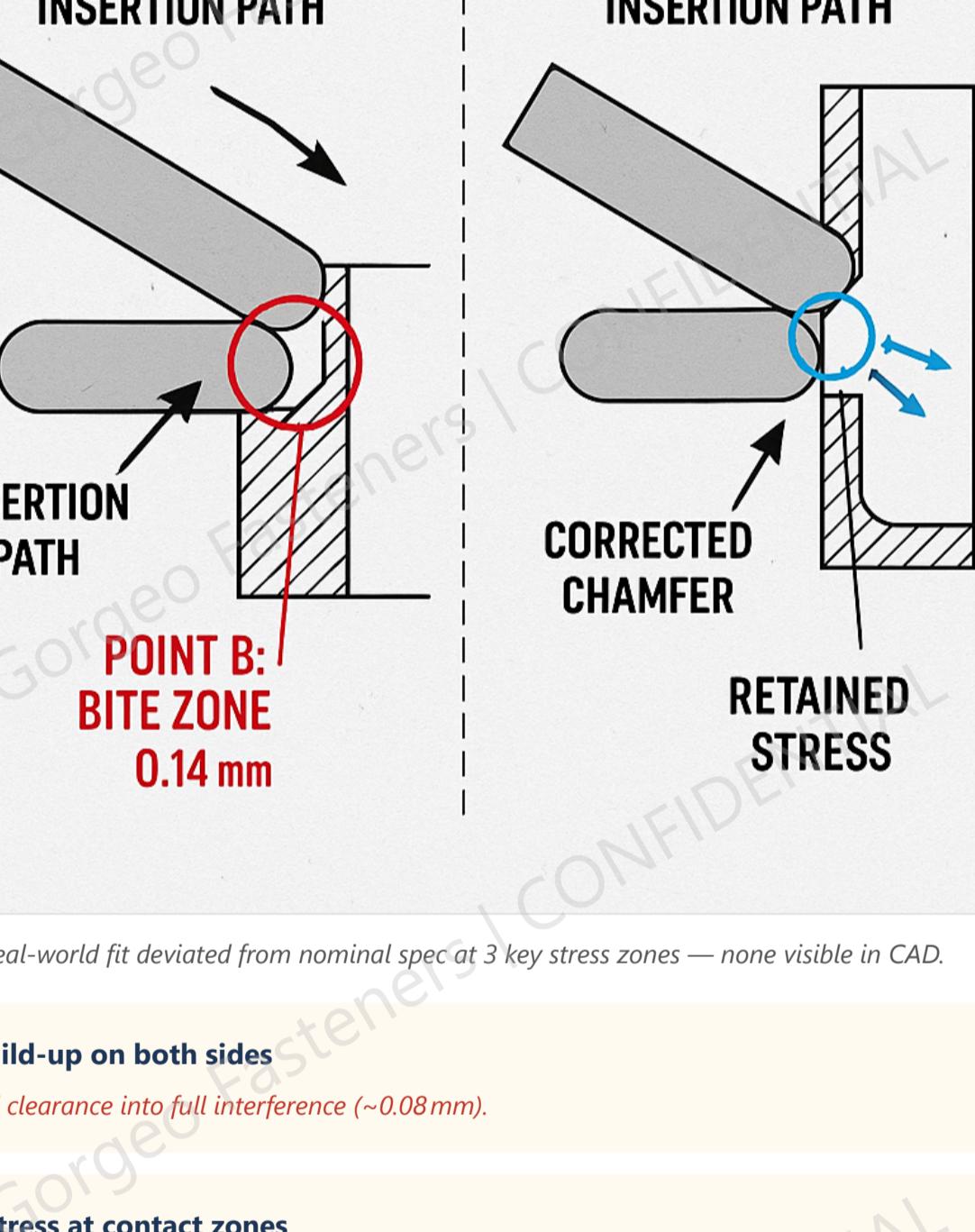
*This fit passed CAD and spec validation — but coating wasn't modeled.*

Client said:

"Previous batches worked fine. This one just jammed — same vendor, same coating, same CAD."

We suspected tolerance drift or coating unevenness. Measurements? Within spec. Turns out, the CAD modeled a bare metal fit. But powder coating added ~0.05–0.06 mm per side. The interference wasn't in the drawing — it was in the build-up.

#### TRAP #1: COATING-INDUCED INTERFERENCE PATH



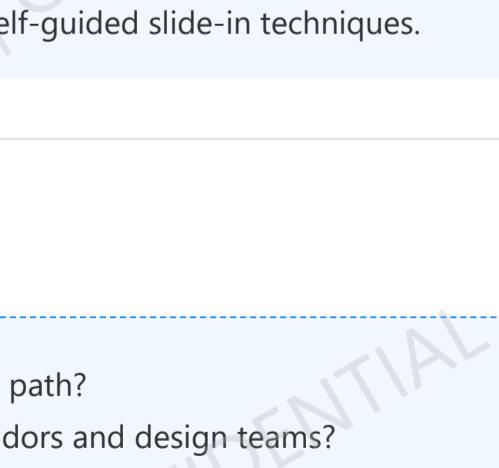
*Powder residue and edge flaking visible — pressure point matched CAD fit zone.*

#### INSERTION PATHS—SIDE LOAD EFFECTS

##### ECCENTRIC PATH (FAILURE)



##### RETAINED STRESS (CORRECTED)



*Real-world fit deviated from nominal spec at 3 key stress zones — none visible in CAD.*

##### Powder build-up on both sides

→ Converted clearance into full interference (~0.08 mm).

##### Retained stress at contact zones

→ Led to seizure after second runtime cycle.

##### Force-fit during rushed assembly

→ Caused gouging, flaking, and permanent lock-up.

### ► Engineering Fixes

**Design:** Chamfer  $\geq 0.5 \text{ mm} / 30^\circ$  at insertion lead to ease guided entry.

**Process:** Mask coating near fit zones or redesign to tolerate  $+0.1\text{mm}$  stack-up.

**Assembly:** Avoid rubber mallet press-fit — use self-guided slide-in techniques.

### ► Path Forward & Discussion

- Do you log coating-related fit failures in your QA path?
- Is there a standard interface between surface vendors and design teams?

[Request Teardown Sketch](#)

#### Your Contact & Assembly Fit Consultant

**Catherine Zhang**

Gorgeo Fasteners

Email: catherine.zhang@gorgeofasteners.com

LinkedIn: [View Catherine's Profile](#)

[→ Discuss This Case Study via Email](#)