Aesthetic/Application Defects

Wrinkling

Slumping / sagging

Dry spray

Poor hangability

Surges

Cracks

Pinholes

Orange Peel

Cratering (top coats only)

Slow drying time

Product not spraying or flowing

Poor spray pattern / excessive overspray

Critical to fire safety defects

Product not adhering to the substrate

Efflorescence

Blistering

Delamination

Frost damage of the wet coating
Wrinkling

What is it?
- A wrinkled texture on the surface of the product as it cures

Why is this happening?
- Applied WFT is higher than recommended
  - This leads to a ‘skinning’ effect, where the top layer dries before the material underneath has a chance to dry

How to fix it:
- Nothing required from a fire-safety perspective — no detrimental effect on fire performance
- If superior aesthetics are required: sand to smooth surface
Slumping / sagging

What is it?

- Product appears to ‘sag’ or ‘slump’ down
- Often, beads of paint pool and run down the surface

Why is this happening?

- Applied WFT much higher than recommended
- The product was thinned prior to use
- Applicator stood too close to the structure during application

How to fix it:

- Nothing required from a fire-safety perspective — no detrimental effect on fire performance
- If superior aesthetics are required: sand to smooth surface

Notice:

- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Dry spray

What is it?

- Poor atomization of intumescent material

Why is it happening?

- Applicator stood too far from structure during application
- Application temperature too high

How to fix it:

- Nothing required from a fire-safety perspective — no detrimental effect on fire performance
- Ensure you are at a correct spraying distance from the surface, and within product spray parameters
- If superior aesthetics are required: sand to smooth surface
Poor hangability

What is it?
- You are getting lower than expected wet film thicknesses

Why is this happening?
- Condensation / moisture on the steel surface
- Thinned product used
- Residual water in the spray pump

How to fix it:
- Nothing required from a fire-safety perspective — no detrimental effect on fire performance
- Let the intumescent coating dry completely
- If superior aesthetics are required: sand smooth

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Surges

What is it?
- Intumescent material that sprays out from pump in a stream vs. an atomized spray fan

Why is this happening?
- Cavitation of the pump
- Short tip blockage by foreign matter

How to fix it:
- Cavitation: ensure sufficient level of intumescent in the pump feed
- No repairs required from a fire-safety perspective — no detrimental effect on fire performance
- If superior aesthetics are required: sand to smooth surface

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Cracks

What is it?

■ Physical cracks running through surface of material

Why is this happening?

■ Higher than recommended WFT, high air flow, low humidity

How to fix it:

■ Application of a stripe coat can prevent crack formation if conditions exist that favor crack formation

■ For hairline cracks — No repairs required from a fire-safety perspective — no detrimental effect on fire performance
   • All other cracks/gaps must be filled

■ If superior aesthetics are required, apply a brush coat of material on top of the crack

Stripe coat can be brushed on to the steel member directly
Pinholes

What is it?

■ Minor pinholes/craters in surface of product

Why is this happening?

■ Poor atomization
■ Air entrapment

How to fix it:

■ Check pump settings to ensure parameters are within product requirements
■ Check tip for signs of wear, and when in doubt — change it
■ No repairs required from a fire-safety perspective — no detrimental effect on fire performance
■ If superior aesthetics are required: sand to smooth surface

Notice:
• All repair MUST ensure that required DFT thicknesses are met as per UL requirements
• Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Orange Peel

What is it?
- Rough textured appearance, similar to the peel of an orange, on the surface of the product

Why is this happening?
- Normal appearance for high build coatings
- High WFT have a propensity to orange peel
- High gloss top coat exacerbates the appearance

How to fix it:
- No repairs required from a fire-safety perspective — no detrimental effect on fire performance
- If superior aesthetics are required: sand to smooth surface
Cratering (top coats only)

What is it?
- Pock-marked top coat

Why is this happening?
- Defect in the top coat caused by foreign matter
- Frequently observed with polyurethane and silicone top coats
- NOT a problem of the intumescent

How to fix it:
- Ensure that top coat is properly mixed. When in doubt, filter the top coat
- Contact your topcoat manufacturer for continued issues
- No repairs required from a fire-safety perspective — no detrimental effect on fire performance
- If superior aesthetics are required: smooth top coat and re-apply a thin layer

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Slow drying time

What is it?
- Product does not dry at expected rates

Why is this happening?
- Temperature and humidity level outside specification
- Low air flow / air exchange
- Fire Film applied too thick per coat
- Thinned product used
- Additional coats of Fire Film applied too soon
- Top coat applied too soon

How to fix it:
- Ensure application conditions are within the Fire Finish application guidelines

Poor spray pattern / excessive overspray

Why is this happening?
- Wrong tip size or fan
- Worn tip
- Pressure from pump is too high/too low

How to fix it:
- Ensure application conditions are within the Fire Finish application guidelines

Product not spraying or flowing

Why is this happening?
- Equipment may not have been cleaned
- Product too cold
- Shelf life of product expired
- Lid left off container for too long
- Material not adequately stirred prior to use

How to fix it:
- Check equipment: tips, pressure, blockages, hose diameter/length
- Ensure application conditions are within the Fire Finish application guidelines
The following issues are indicative of CRITICAL application defects.

In all of these situations, the Fire Finish product must be removed in it’s entirety, and then reapplied after fixing the application conditions as outlined in the application guide.

Product not adhering to the substrate

What is it?

■ The spray product does not adhere to the substrate — slides off during the initial spraying/drying process

Why is this happening?

■ The primer may not be compatible, or the product was applied outside of the specified recoat window (of its primer)

■ Contamination of substrate (oil, grease, …)

How to fix it:

■ The Fire Finish product MUST be removed completely from the steel member

■ Check primer compatibility
  ■ Remove incompatible primer
  ■ Re-blast steel and apply approved primer

■ Remove contamination
  ■ De-grease, water jet, ...
  ■ Re-apply Fire Finish as per UL requirements

Notice:

• All repair MUST ensure that required DFT thicknesses are met as per UL requirements
• Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
**Efflorescence**

**What is it?**
- Looks like there is ‘salt formation’ on the surface of the material

**Why is this happening?**
- Entrapment of water-vapor
- Exposure to water or non-interior use conditions

**Repair**
- The Fire Finish product MUST be removed completely from the steel member and reapplied
  - No way to repair the material — fire performance has been compromised

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Blistering

What is it?
- Surface of the material seems to have ‘blisters’ on it

Why is this happening?
- Exposure to pooling / standing / running water

Repair
- The Fire Finish product MUST be removed completely from the steel member and reapplied
  - No way to repair the material — fire performance has been compromised

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Delamination

What is it?
- Product delaminates off the steel structure after it is dry

Why is this happening?
- Product applied over incompatible surface or primer
- Contamination of substrate or product
- Moisture ingestion over time

Repair
- The Fire Finish product and base Primer MUST be removed completely from the column and reapplied
  - No way to repair the material — fire performance has been compromised
- Re-apply after blast cleaning and priming the steel with an approved primer

Notice:
- All repair MUST ensure that required DFT thicknesses are met as per UL requirements
- Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
Frost damage of the wet coating

What is it?

■ Coagulated product that cannot be stirred up

Why is this happening?

■ The product has been frozen and subsequently thawed

How to fix it:

■ DO NOT USE: Dispose of complete bucket if freeze indicator is activated

If the Check Mark on the label is obscured, then the product has been previously frozen.

Notice:

• All repair MUST ensure that required DFT thicknesses are met as per UL requirements
• Instructions above are general guidelines — always refer to the applicable listing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information
The data contained in this literature was current as of the date of publication. Updates and changes may be made based on later testing. If verification is needed that the data is still current, please contact the Hilti Technical Support Specialists at 1-800-363-4458. Local base materials were used. Because of variations in materials, on-site testing is necessary to determine performance at any specific site. Printed in the United States.\*14001 US only

© Copyright 2016 by Hilti, Inc. (U.S.) • 09/16 • DBS