

DSS-Th.03.01 | Thermal / Hot Particle / Fusion & Thermal Stress

Differential Heating Stress Crack (edge origin)

Thermal stress/shock - integrity cue; out of in-place scope

Diagnosis summary

A differential heating stress crack is a through-thickness (or actively propagating) fissure that initiates when nonuniform heating/cooling creates thermal stress exceeding glass strength, commonly at edges/corners or hardware penetrations. Any confirmed crack is an integrity condition and is out of in-place restoration scope (CAT-5 by condition/location). This DSS defines identification and documentation;

Field identification cues

- Surface-catch (MSRT).
- Do not pass a stylus across any suspected crack. If needed, a single light, non-marring pass adjacent to the origin chip/edge may document local relief context only. MSRT is auxiliary and never determinative for integrity.
- Visual signature
- Phase-stable, continuous filament that persists through small viewpoint shifts; unlike scratches, it can traverse faint films/texture without loss of continuity.

Classification, severity and scope

- CAT-5 (default): Any confirmed thermal stress crack (edge, corner, hole/notch, or hot-spot origin) → Non-Repairable / Out of In-Place Scope.
- Reassign only if no crack is present:
- If examination finds only surface abrasion (no fissure), classify under M.01 (linear scoring) or M.02 (abrasion fields) as appropriate.
- If it is solely edge micro-chips/spalls at a hole/notch without a continuous fissure, use M.06.01 / M.03.04.
- CAT is governed by integrity/location for cracks; acceptance is evaluated separately under VIS §6.

Distinguishing criteria

- vs. Linear surface scratch: Scratches exhibit abrasive edges with MSRT catch and chip-flank sparkle; cracks remain phase-stable and should not be stylus-tested.
- vs.
- vs. Laminate-internal feature / IGU artifact: Use parallax and reflection tracking to confirm ply/cavity location; internal = CAT-5 by location.

Documentation and inspection

- Safety. Ensure area is safe/stable before close documentation; avoid loading a cracked lite.
- Photo set (VIS):
- Overall: 72 in and 36 in, normal incidence, capturing the full fissure path and edges/corners/hardware.

Safety / repairability boundary: Complete only the non-invasive reveal and inspection steps authorized by the controlling VIS guidance. Classification does not authorize restoration, establish acceptance, or override stop-work, coating, crack, integrity, access, chemical, fall-protection, or project-specific requirements.

Full DSS publication: use the catalog download. Web specification:

<https://a7df714357.nxcli.io/learning-center/resource-center/damage-specification-standards/dss-th-03-01-differential-heating-stress-crack-edge-origin/>