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Test Façade Mock-Up for Thermal Cycling and Seal Durability

Test façade mock-up for thermal cycling and seal durability using an interactive checklist, fully commentable, with export as PDF/Excel. Capture calibrated evidence for confident approval.

Project:	
Date:	
Filled by:	

Pre-Test Setup	
1	Verify mock-up geometry matches approved drawings using tape/laser; record dimensions at control points within ±5 mm; upload annotated photos and mark-up of variances; attach approved test plan.
2	Confirm environmental chamber range and volume meet project setpoints per approved plan; calibration certificate valid with temperature accuracy ≤ ±0.5 K; photograph nameplate and certificate.
3	Verify mock-up anchorage and support framing; torque critical fasteners to specified values using a calibrated torque wrench (±5%); log torque readings and locations.
4	Check sealant cure status meets manufacturer minimum before cycling; record batch/lot numbers and installation date; verify cure by tack-free observation; attach data sheet excerpt.
5	Brief team on safety, emergency stop, and evacuation routes; verify PPE availability; capture sign-in sheet and emergency plan photo at chamber entrance.

Instrumentation and Calibration	
6	Install Type T thermocouples at interior/exterior faces and joint centers per layout; verify with ice point 0 ±1 °C; record serial numbers and mapping photo.
7	Fit displacement transducers/linear scales across primary seals; calibrate with gauge blocks; confirm accuracy within ±0.5 mm over expected stroke; store calibration records.
8	Configure temperature/RH data loggers at 1 min sampling; synchronize time with chamber controller within ±60 s; capture synchronization screenshot.
9	Place RH probes in radiation shields away from direct view factors; verify against saturated salt reference 75 ±3 %RH; upload comparison sheet.
10	Perform baseline IR scan at 23 ±2 °C to identify thermal bridges; capture stitched images of all joints; file with location codes.

Mock-Up Inspection (Pre-conditioning)	
11	Inspect sealant beads for continuity and bond line wet-out; conduct light hand-probe adhesion at three locations; acceptance: no adhesive failure; capture close-up photos.
12	Measure joint width and depth at 1 m intervals using calipers/depth gauge; variance within ±1 mm of design; log values to checklist table.
13	Verify substrates clean and dry; measure surface moisture <5% using pin meter; record readings and waiting times before chamber loading.
14	Confirm glazing/support brackets are tight; recheck torque on random 10% sample within ±5% of specified; note any resets with photos.

Thermal Cycling Procedure	
15	Stabilize at baseline 23 ±2 °C until ΔT across panel <1 K over 15 min; record stabilization time and screenshots.
16	Program low/high setpoints per plan; ramp rate 1–3 K/min; dwell 60 ±10 min at each plateau; verify first cycle within ±2 K; save controller export.
17	Run specified number of cycles uninterrupted; auto-log cycle count; document any aborts with root cause and corrective actions; attach event log.
18	Activate joint-movement actuators if specified; verify stroke amplitude against plan within ±1 mm using ruler/video overlay; upload verification video.
19	At each high-to-low transition, inspect seals for distress, frost, or condensation; capture macro photos before wiping; note locations and cycle numbers.
20	Monitor interior–exterior joint ΔT at three locations; acceptance: within ±2 K of setpoints during dwells; export interim plot after 10 cycles.

Seal Durability Assessment	
21	After final cycle, stabilize at 23 ±2 °C for ≥2 h; inspect seals at 10× magnification; acceptance: no through-cracks or debonding; photo per metre.
22	Measure Shore A hardness at marked spots; Δ from baseline within manufacturer limits; five readings per area; attach durometer calibration evidence.
23	Perform field adhesion check using 180° hand pull per manufacturer method; acceptance: cohesive failure or thin-film transfer only; document photos and notes.
24	Measure residual set: return actuators to zero and remeasure joint widths; residual set ≤ specified mm; record comparison table.
25	Apply low-tack dye tracer along seal edges; wait 5 min, wipe, then inspect; acceptance: no dye penetration across seal; capture before/after photos.

Post-Test Documentation and Sign-Off	
26	Compile temperature/RH/displacement logs; verify continuous timestamps; store in structured folders; attach checksum or hash for files.
27	Upload labeled photos/videos with location codes, cycle numbers, and timestamps; ensure minimum one image per joint per stage.
28	Complete deviation/NCR register with corrective actions; reference checklist item IDs; obtain consultant acknowledgment within agreed timeframe.
29	Issue final report summarizing procedure, results, and acceptances per approved project specifications and authority requirements; collect digital signatures and publish QR-authenticated link.

Comments:

Filled by:

Signature:

Introduction	How to use this checklist
Test façade mock-up for thermal cycling and seal durability is a focused procedure for validating façade performance under controlled temperature extremes and repeated joint movement. This checklist supports façade performance testing on curtain wall mock-ups using an environmental chamber, linking thermal profiles to sealant adhesion, cohesion, and recovery. It concentrates on thermal cycling and seal durability only, avoiding unrelated wind, seismic, or water-penetration testing. Users will plan instrumentation, calibrate loggers, program cycles, and verify acceptance against project specifications and authority requirements. Outcomes include documented stability of temperatures, controlled ramps and dwells, quantified displacement, and objective observations of seal condition. By capturing photos, data logs, hardness readings, and adhesion pulls, teams reduce retests and deliver defensible results for approval. Use this interactive tool to assign responsibilities, timestamp evidence, and close findings efficiently. Tick, comment, and export to PDF/Excel with QR.	1. Preparation: Assemble the team, confirm chamber booking, gather calibrated sensors, durometer, probe tools, cameras, and PPE. Upload the approved test plan and drawings so acceptance cues are visible during execution. 2. Start interactive mode: Open the checklist on a tablet, assign roles, enable timestamps, and set required evidence fields (photos, files, signatures) for critical steps. 3. Record evidence: Use the device camera for annotated photos and short videos. Attach calibration certificates and controller screenshots directly to the relevant steps. 4. Collaborate: Add comments where issues arise, tag responsible parties, and track resolutions. Keep all discussions anchored to the exact checklist item. 5. Export: On completion, export the record as PDF/Excel for submittals. Store the files in the project repository with standardized naming. 6. Sign-Off: Capture digital signatures from lab, contractor, and consultant. Archive the set with a QR-authenticated link for verification.