



HIGH-PERFORMANCE CEMENTITIOUS TILE ADHESIVE (C3 SERIES)

Code C3 | High bond · low shrinkage · durable | C3/C3T/C3E/C3TE/C3TES1 (T slip-resistant · E extended open time · S1 deformable) | For ceramic/porcelain tiles, large panels and sintered stone | Standard Q/TBJX 39-2026

OVERVIEW AND TECHNICAL PRINCIPLE

The High-performance Cementitious Tile Adhesive is a powder made from high-free-lime belite calcium sulphotoaluminate clinker, gypsum, ground granulated blast-furnace slag, sand and additives, mixed with water on site; it is characterized by high bond, low shrinkage and durability (code C3). On mixing, rapid hydration forms a composite structure dominated by needle-like ettringite (AFt) and C-S-H gel, giving a continuous dense bonding network with high body strength and interfacial bond, while the low-shrinkage design reduces interfacial stress from long-term movement.

Positioning: "C3" here is not a class from JC/T 547 but a company grade defined in Q/TBJX 39-2026. Specify the standard, model and design requirements together — do not use "C3" alone in place of the full technical spec.

Raw material	Requirement	Function
High-free-lime belite sulphotoaluminate clinker	Mineralogy per Q/TBJX 39-2026	Basis for rapid, characteristic hydration
Gypsum (natural/building/by-product)	GB/T 5483, GB/T 9776, GB/T 21371	Takes part in sulphotoaluminate hydration
GGBFS	GB/T 18046 grade S95 or S105	Forms composite binder; uses industrial by-product
Sand	GB/T 14684; fineness modulus 0.7–1.5	Provides skeleton and workability
Additives	Compatible and performance-meeting	Tune retention, workability, slip, flexibility

KEY FEATURES

- High, durable bond: assessed by tensile bond at 28 d and after immersion, freeze-thaw and heat ageing — not just initial bond but retention after water, temperature and freeze-thaw.
- Low shrinkage & stability: 28 d shrinkage $\leq 0.18\%$ with defined flexural/compressive strength, controlling adhesive-layer movement and cracking for durable large-format work.
- Multiple models: T/E/S1 combinations meet slip resistance, longer open time and some lateral deformation — selected by tile size, substrate, location, climate and logistics.
- Low-carbon approach: GGBFS as a key component raises by-product utilization and reduces reliance on ordinary cement; actual benefit per project boundary and LCA.

CLASSIFICATION, CODES AND SCOPE

Code	Standard name	Added property
C3	High-bond cementitious tile adhesive	Base
C3T	+ slip resistance	T: slip resistance
C3E	+ extended open time	E: extended open time
C3TE	+ slip & open time	T + E
C3TES1	+ slip, open time & deformability	T + E + S1

Condition	Model	Design / site note
Indoor stable base, standard tile	C3	Trial by tile absorption, size, substrate
Interior walls / anti-sag	C3T / C3TE	Right notch; check slip and joints
Large area / hot-dry / slow work	C3E / C3TE	Limit spread area; never place over skinned adhesive
Large panels / sintered stone	C3TE / C3TES1	Back-butter, mechanical handling, de-air; anchors if designed
Exterior / high thermal-humidity swing	C3TES1	Special design of base, joints, details, safety
Pools, showers, wet areas	C3TE / C3TES1	Compatible cured waterproofing; strict coverage/details

Not directly suitable: loose, dusting, oily, condensing or continuously wet substrates; timber, metal, glass, plastic, old organic coatings or other high-movement/low-absorption bases (unless a matched interface system is proven); using the adhesive as thick leveling or spot-fixing instead of full contact; natural stone or mesh-/resin-backed materials with staining/compatibility risk not proven by sample; areas with active cracking, bridged movement joints, sustained vibration or over-design loads without special detailing.

TECHNICAL PERFORMANCE

Property	Requirement
Tensile bond	≥ 2.0 MPa
After immersion	≥ 2.0 MPa



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After freeze-thaw	≥2.0 MPa
After heat ageing	≥1.5 MPa
After ≥20 min open time	≥0.8 MPa
28 d compression	≥15.0 MPa
28 d flexure	≥5.0 MPa
28 d shrinkage	≤0.18%

Note: substrates (tile, concrete slab) for bond tests conform to GB/T 41059; flexural/compressive specimens and curing per the enterprise standard.

Class		Property	Requirement
T	Slip		≤0.5 mm
E	Bond after ≥30 min open time		≥0.5 MPa
S1	Transverse deformation		≥2.5 mm

In context: lab values are for grading and conformity. Site safety also depends on substrate strength, tile-back condition, real contact area, adhesive thickness, joint design, environment, curing and service load. High bond does not replace detailing and structural design.

Special indicator	C3	C3T	C3E	C3TE	C3TES1
Slip resistance (T): slip ≤0.5 mm	—	✓	—	✓	✓
Extended open time (E): bond ≥0.5 MPa after ≥30 min	—	—	✓	✓	✓
Deformability (S1): transverse deformation ≥2.5 mm	—	—	—	—	✓

All models meet the same base performance (tensile bond ≥2.0 MPa in standard/immersion/freeze-thaw, ≥1.5 MPa after heat ageing, ≥0.8 MPa after ≥20 min open time, 28 d compression ≥15.0 MPa, flexure ≥5.0 MPa, shrinkage ≤0.18%). "✓" = the model must also meet that added indicator; "—" = not required.

SUBSTRATE AND MATERIAL PREPARATION

Substrate basics: sound (no dusting, powdering, hollows, cracks, loose or weak layers); clean (no dust, oil, wax, release/curing agent, coating residue); stable (shrinkage/movement essentially complete; do not bridge structural/movement joints); flat (level first with a compatible material — do not correct large deviations with abnormally thick adhesive); correct moisture (no free water, condensation or negative pressure; treat fast-absorbing bases with a matched system).

Check	Method	Acceptance basis
Surface strength	Cross-cut, pull-off or per design	Remove weak layers; per design/acceptance
Flatness / plumb	2 m straightedge, laser	Meet finish/thickness; level if out of tolerance
Hollows / cracks	Tap, visual, crack gauge	Find cause; repair before work
Cleanliness	Wipe, water-drop test	No dust, oil or water-repellent contamination
Waterproofing	Records, adhesion/flood test	Fully cured, sound, compatible

Tile preparation: check size, warp, cracks, chips, absorption, back profile and dust; remove back laitance, release powder, oil and temporary protection; for mesh-/resin-backed or composite tiles, verify bond and water/heat resistance of that layer; for large panels, pre-plan layout, numbering, dry-fit and handling routes.

Category	Recommended kit
Dosing / mixing	Water measure, low-speed mixer, round-base bucket
Trowelling	Flat and square/round-notch trowels, edging tools
Panel handling	Suction cups, rigid frame, team/mechanical lifting
Bedding / de-airing	Rubber mallet, vibrating leveller/plate (if permitted)
QC	Straightedge, level, spacers, timer, scale, coverage tools
PPE	Gloves, goggles, mask, helmet, boots, fall protection

STANDARD APPLICATION

Sequence: (1) confirm model, batch, validity and project spec; check substrate, tiles and environment; (2) add water then powder at the labelled ratio, low-speed mix to a uniform lump-free paste; (3) slake as required, briefly re-mix — no retempering or foreign additions; (4) key a thin contact coat with the flat edge, then comb even, unidirectional ribs with the chosen notch; (5) place within the open time; back-butter for large panels, exterior, wet areas and high load; (6) slide the tile perpendicular to the ribs and bed it, with light vibration if needed, to collapse the ribs and expel air; (7) adjust level, flatness, plumb and joint width promptly and clean off excess; (8) cure per the project and protect from traffic, vibration, immersion, freezing and rapid drying until opened.



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Tile / area	Notch principle	Control
Small tile, flat base	Continuous contact, controlled thickness	Key thin, comb one way
Medium/large floor tile	Larger notch plus thin back-butter	Lift tiles to check collapse
Panels / sintered stone	Set by panel, warp and design	Back-butter, mechanical handling, de-air
Walls	Coverage + slip; prefer T	Set from datum; check movement
Exterior / wet	Near-void-free full contact	Check edges, drains, details

Key actions: keep ribs parallel — avoid closed loops or crossing patterns; bed so ribs collapse in sequence and air escapes to the edge; never spread more than can be tiled within the open time. Mix with clean potable water; never retemper set, skinned or over-time adhesive.

LARGE PANELS AND SINTERED STONE

Why special control: large panels are heavy with low back absorption, and small flatness deviations accumulate over the area. Edge-only pressure or spot-fixing leaves un-collapsed ribs and trapped air in the centre — low effective contact, uneven load and hollows. The key is a flat base, correct spreading, back-buttering and a de-airing bedding path, not simply a thicker adhesive layer.

- Double-butter: key and comb continuous parallel ribs on the base along a short de-airing path; thinly back-butter the panel to fill the profile without heavy crossing grooves; land it flat with cups/frame — don't fix edges first and leave the centre bridged; bed from centre to edge across the ribs until they fully collapse.
- Coverage & checks: lift tiles at the first unit and on any shift/batch/base/tile/environment change; use stricter full-coverage for exterior, wet, panel and high-load areas — no starved edges; per design and acceptance.
- Thickness & leveling: heaping adhesive to fill gaps causes differential shrinkage, uneven set, stress and trapped air; instead improve base flatness, then get a continuous layer via notch, back-buttering and mechanical bedding.
- Joints & safety: keep tile, perimeter, field, structural and movement joints per design — never rigidly filled; whether exterior/high panels need mechanical anchoring follows current standards, design, panel size, building height and risk; lifting equipment rating, cup condition, crew and fall protection must meet safety rules.

TYPICAL APPLICATIONS

- Large-format walls / lobbies: C3T, C3TE or C3TES1; control plumb, slip, back-buttering, handling and joints; where services/voids sit behind, the designer defines the full system.
- Commercial floors / public areas: C3E, C3TE or C3TES1; control flatness, one-way combing, open time, full contact, field joints and opening time; special design for heavy/vibrating/wheel-load areas.
- Exterior facades / thermal swing: prefer C3TES1; set the system by panel, height, substrate and climate; avoid rain, strong wind, sun, freezing and hot substrates; apply designed mechanical safety for high/large panels. This manual is not a structural, wind or fall-safety design for facade panel systems.
- Pools, showers, wet areas: confirm cured, compatible waterproofing; detail drains, corners, pipe roots and wall/floor junctions per the system; minimize voids; grout/sealant compatible with media and cleaners; filling/opening time per the full system.

CONSUMPTION AND SITE QC

Condition	Estimate	Drivers
Small/medium tile, flat base, one-side	≈3–5 kg/m ²	Notch, back profile, bedding
Medium/large tile, double-butter	≈5–8 kg/m ²	Base deviation, back-butter amount
Panels / strict full coverage	≈6–10 kg/m ² or by panel	Warp, special layer design

Estimate by a representative panel: record area and actual powder used, add reasonable wastage as the purchase basis; never cut necessary contact area to save material.

Stage	Record	If non-conforming
Pre-start	Model/batch, base, waterproofing, tile back, environment	Stop; clean, repair or prove compatibility
Mixing	W/P, mix/start time, paste state	Isolate; no ad-hoc water
Spreading	Notch, angle, rib direction, area	Re-comb; remove skinned adhesive
Placing	Open time, bedding path, joint, level	Adjust at once; else remove and redo
Checking	Coverage, edge fill, rib collapse	Reduce area, tune notch/bedding, recheck
Curing	Protection time, T/RH, rain/freeze/vibration	Extend protection; assess impact

Panel system: before work, make a panel matching the real base, tile, tools and crew; verify workability, slip, open time, coverage, appearance, joints and pull-off; turn results into a written method card (model, water, notch, area, bedding path, check frequency, curing).

TROUBLESHOOTING

Symptom	Cause	Action
Low centre coverage	Warp; ribs not collapsed; edge-only pressure; skinning	Improve flatness; back-butter; de-air centre → edge; smaller area



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Wall tile sag	Wrong model; thin paste; thick bed; over-adjusting	Use T; control water; level base; set datum, check early
Hollows / starved edges	Spot-fixing; small notch; poor bedding; dirty back	Continuous one-way combing; clean back; larger notch/back-butter; lift-check
Rapid skinning	Heat/wind/low RH; too much area; absorptive base	Shade/windbreak; smaller area; treat base; never re-wet skinned adhesive
Cracking / delamination	Base cracking/movement; bridged joint; freeze/wet curing; incompatibility	Find cause; restore joints; repair base; re-verify system
Panel lippage	Uneven base; uneven bed; poor handling	Level first; frames and leveling clips; correct within window

PACKAGING, TRANSPORT, STORAGE AND SAFETY

Marking & packaging: composite bags conforming to GB/T 9774, net content per JJF 1070. The pack states product name, producer and address, trademark, designation, net mass, instructions, production date or batch, shelf life and transport/storage notes; other forms by agreement.

- Store types separately with clear labels; protect from rain, damp, damage and contamination; ventilate and avoid weather.
- Shelf life per the producer's label/manual from production date; retest expired or damp product before use.
- Powder and paste can be alkaline and dusty — use mask, goggles and alkali gloves with ventilation; avoid prolonged skin/eye contact; flush eyes and seek care.
- Panel handling, work at height, vibration and power tools by trained staff per procedure; dispose of empty bags, waste paste and wash water per local rules; do not discharge fresh paste to drains.

Safety documents: obtain and read the latest product SDS and pack safety marking before use. This manual does not replace the SDS.

RECORDS, ORDERING AND REFERENCES (ANNEX A, B)

Records to accompany/file: COA, standard and model marking; works test report and any contracted type/third-party tests; batch, date, quantity and storage records; method statement, panel sign-off, mixing/placing records, coverage checks and concealed-work acceptance; design, compatibility tests and detail acceptance for exterior, panel and wet-area works.

Item	Rule
Lot	Same process, 100 t = one lot (or less)
Sampling	20 kg/lot, mixed and split: one test, one retained
Works test	Open time, 28 d tensile bond; slip/deformation by contract
Type test	Base performance of the class plus contracted special items
Decision	≥2 fails = reject; a single fail may be retested once on the retained sample

Designation examples: Q/TBJX 39-2026 C3T (high-bond, slip-resistant); Q/TBJX 39-2026 C3TES1 (slip-resistant, extended open time, deformable). Ordering info: model, net content, quantity, project area, tile/panel size, batch data and special-performance needs. References: Q/TBJX 39-2026 (High-performance cementitious tile adhesive) and its explanatory note; GB/T 41059 (tile adhesive requirements); JC/T 547 (tile adhesive); GB/T 17671 (cement mortar strength, ISO method); JC/T 313 (expansion test for expansive cement).

COMPANY INFORMATION

Item	Information
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