



EDITION 2026 • GLOBAL FIELD STANDARD

ISO 13006 • EN 14411 GROUP BIA • ANSI A108.19

SHEEN OVERSEAS

ARCHITECTURAL SINTERED PORCELAIN SLABS • TECHNICAL PUBLICATION

LARGE FORMAT SLAB TILE INSTALLATION MANUAL



FEATURED DESIGN: BLACK MARQUINA • HIGH GLOSS LUXURY SINTERED SLAB 1200X3200MM

Comprehensive field manual for professional tile contractors, architectural cladding engineers, master installers, site supervisors, and quality inspectors. Standardized protocols covering receiving, vacuum carrying frames, substrate flatness tolerances (< 2mm over 2m), 100% back-buttering with slanted-notch trowels, C2TE S1/S2 high-deformable adhesives, mechanical leveling clips, 45° miter corners, and 10-year warranty compliance.

SHEEN OVERSEAS PRIVATE LIMITED

National Highway 8-A, Sartanpar Road, Morbi - 363642, Gujarat, India
ISO 9001:2015 • CE Marking • EN 14411 B1a • GreenGuard Gold

DOC REF: SO-STM-2026-V1

DISTRIBUTION: INTERNATIONAL ARCHITECTURAL

Slab Formats: 1200x3200 to 800x2400 mm (6, 9, 12, 15mm)



DOCUMENT CONTROL

Document Information & Engineering Standards

Governing standards, international tile codes, and architectural scope.

1. Technical Scope & Legal Mandate

This technical field manual governs the handling, substrate preparation, adhesive mortar spreading, mechanical leveling, joint grouting, and post-installation care of **Sheen Overseas Large Format Sintered Porcelain Slabs**.

Large format slabs (formats up to 1200 x 3200 mm in 6mm, 9mm, 12mm, and 15mm gauges) possess distinct physical, flexural, and handling dynamics compared to traditional ceramic tiles. Standard tile laying techniques are wholly insufficient and will result in hollow voids, lippage, or impact fractures.

WARRANTY ADHERENCE CONDITION

Compliance with the methods described in this manual validates the **Sheen Overseas 10-Year Architectural Surface Warranty**. Deviations (e.g., spot-bonding, swirl troweling, lack of leveling clips) void all claims.

2. Master Document Metadata

Metadata Field	Engineering Parameter
Document Reference	SO-STM-2026-V1.0
Title	Large Format Slab Tile Installation Manual
Governing Standards	ISO 13006 / EN 14411 Bla, ANSI A108.19, DIN 18202
Applicable Slabs	Sintered Porcelain (1200x3200, 1200x2800, 1200x2400, 800x3200, 800x2400)
Thickness Gauges	6mm (Slim), 9mm, 12mm, 15mm
Publish Date	January 1, 2026

3. Architectural Technical Support

For custom ventilated facade engineering, exterior freeze-thaw submittals, or structural movement joint calculations, contact our technical desk:

- **Global Desk:** contact@sheenoverseas.com
- **Cladding Department:** export@sheenoverseas.com
- **Web Portal:** www.sheenoverseas.com/technical-specs/



CORPORATE HERITAGE

About Sheen Overseas — Sintered Slab Technology

Morbi continuous sintering manufacturing lines and global export logistics.

1. Morbi Manufacturing Excellence

Headquartered in Morbi, Gujarat—the global capital of advanced ceramics—**Sheen Overseas Private Limited** operates India's most technologically advanced continuous sintering production lines.

Our continuous roller kilns (firing at 1,220°C) and automated dry pressing systems (exceeding 25,000 tons of compaction force) transform pure kaolin clays, feldspars, and silica minerals into ultra-compact, glass-vitrified sintered slabs with zero water absorption (< 0.05%).

Direct port access to Mundra (210 km) guarantees efficient global logistics to over 45 destination ports worldwide.

2. Industrial Production Benchmark

Technical Parameter	Sheen Manufacturing Benchmark
Kiln Firing Temperature	1,200°C – 1,220°C (Complete vitrification)
Compaction Force	25,000 Tons Hydraulic Continuous Roll Press
Annual Slab Capacity	Over 2,500,000 M ² / Year
Surface Finishes	Polished, Satin Matt, R10 Textured, Carving
Environmental Standard	ISO 14001, GreenGuard Gold, Zero VOC

FULL PALETTE FORMAT RANGE

Sheen produces full bookmatched marble replicas (Calacatta, Statuario), industrial concrete finishes, and stone basalt textures across 6mm to 15mm thicknesses.





TECHNICAL SCOPE

Purpose of the Manual & Target Professionals

Target guidance for architects, tile contractors, site managers, and inspectors.

This manual provides clear, actionable technical specifications to bridge the gap between architectural vision and jobsite execution, eliminating failures stemming from outdated installation techniques.

FOR ARCHITECTS & DESIGNERS

Review Sections 1, 3, and 4 for format dimensions, minimum joint width rules (2mm), substrate deflection limits (L/720), and bookmatching vein alignments.

FOR MASTER TILE INSTALLERS

Study Sections 5, 6, and 7 for vacuum carrying frames, parallel-ridge back-buttering, C2TE S1/S2 mortar mixing, and mechanical leveling clip calibration.

FOR SITE SUPERVISORS & QC

Focus on Sections 3, 8, and 9 for substrate flatness audits (< 2mm over 2m), lippage inspection (< 0.5mm), acid wash haze cleaning, and warranty handover.

THE SPOT-BONDING PROHIBITION

"Dot-and-dab" or spot-bonding mortar application is **STRICTLY PROHIBITED** on large format slabs. Spot bonding leaves 50% hollow air cavities beneath the slab, resulting in immediate floor cracking when walked upon.



SAFETY PROTOCOL

Important Safety Notice — Slab Weights & PPE

Slab weight matrix across 6mm to 15mm, team lift requirements, and PPE standards.

1. Heavy Load & Handling Hazards

Large sintered slabs are heavy, unwieldy, and brittle prior to being fully supported by a cured mortar bed. Dropping or flexing a slab during handling risks severe crushing injuries to workers and total material breakage.

Crew Size Requirement: Handling and placing full-size 1200 x 3200 mm or 1200 x 2800 mm slabs requires a minimum coordinated team of **four (4) skilled installers** equipped with a multi-cup rigid carrying frame.

2. Personal Protective Equipment (PPE)

- **Safety Gloves:** Cut-resistant Level 5 nitrile-coated gloves.
- **Footwear:** Steel-toed safety boots with metatarsal guards.
- **Eye Protection:** ANSI Z87.1 safety glasses during cutting and scoring.
- **Respiratory:** N95/P100 respirator during wet cutting or dry mixing.

3. Master Slab Weight Matrix

Format (mm)	Thickness	Weight / Slab (kg)	Weight (lbs)
1200 x 2400 mm	6 mm Slim	42 kg	92 lbs
1200 x 2800 mm	6 mm Slim	50 kg	110 lbs
1200 x 3200 mm	6 mm Slim	57 kg	125 lbs
1200 x 2400 mm	9 mm	62 kg	136 lbs
1200 x 2800 mm	9 mm	72 kg	158 lbs
1200 x 3200 mm	9 mm	83 kg	183 lbs
1200 x 2400 mm	12 mm	84 kg	185 lbs
1200 x 3200 mm	12 mm	115 kg	253 lbs
1200 x 3200 mm	15 mm Heavy	135 kg	297 lbs



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SECTION 1 • SLAB INSTALLATION DIVISION

LARGE FORMAT SINTERED PORCELAIN SLABS

Sintering science, ISO 13006 Group B1a performance benchmarks, format dimensions, and applications.

KEY TECHNICAL MODULES IN THIS SECTION:

- Advanced continuous sintering process (1220°C & 25,000 tons pressure)
- Technical performance benchmarks: Water absorption $\leq 0.06\%$, MOR ≥ 40 N/mm²
- Comprehensive 16-row slab format matrix (Image 4 data)
- Applications: Living areas, wet rooms, facades, countertops, commercial halls



FEATURED DESIGN: BLACK MARQUINA • HIGH GLOSS LUXURY SINTERED SLAB 1200X3200MM



SINTERING SCIENCE

What Are Sintered Porcelain Slabs

Mineral composition, 1220°C vitrification, zero resins, and high breaking strength.

1. Sintering Technology & Mineralogy

Sheen Sintered Porcelain Slabs represent the pinnacle of modern ceramic engineering. Formulated using purified natural raw materials—including refined kaolin clays, quartz sands, feldspars, and mineral color oxides—the composite is compacted under 25,000 tons of continuous hydraulic roller pressure.

The compacted slab is fired through a 150-meter computer-controlled roller kiln at temperatures reaching **1,220°C (2,228°F)**. This intense thermal-compression cycle triggers complete molecular vitrification, fusing minerals into a dense, metamorphic stone structure.

2. Physical Distinction from Traditional Tile

Property	Traditional Ceramic Tile	Sheen Sintered Porcelain Slab
Firing Temperature	1,000°C – 1,100°C	1,220°C (Complete vitrification)
Water Absorption	3.0% – 10.0%	≤ 0.06% (Virtually impervious)
Breaking Strength	800 N – 1,300 N	> 7,200 N (15mm) / > 2,000 N (9mm)
UV & Weather Proof	Glaze degrades outdoors	100% UV, Frost, and Fire Proof
Stain Resistance	Porous clay body	Class 5 (Immune to stains)

ZERO ORGANIC RESIN CONTENT

Unlike engineered quartz, sintered slabs contain **zero polymer resins**. They are 100% inorganic mineral compositions, rendering them totally immune to outdoor UV fading and extreme direct flame heat.



BENCHMARK DATA

Sintered Slabs Technical Benchmark (ISO 13006 BIa)

Official Image 2 & 3 lab data: Water absorption $\leq 0.06\%$, Breaking strength 7,200N.

The table below presents the verified physical, mechanical, and safety performance benchmarks for **Sheen Sintered Slabs and Vitrified Porcelain Tiles** as tested under **ISO 13006 / EN 14411 Group BIa** (Image 2 and Image 3 reference data).

Characteristic	ISO 13006 / EN 14411 Group BIa Standard	Sheen Sintered Slab Value (15mm)	Mean Value Polished GVT	Test Method
Length & Width Deviation	$\pm 0.5\%$	$\pm 0.2\%$	$\pm 0.1\%$	ISO 10545-2
Thickness Deviation	$\pm 5.0\%$	$\pm 5.0\%$	$\pm 4.0\%$	ISO 10545-2
Straightness of Sides	$\pm 0.5\%$	$\pm 0.2\%$	$\pm 0.1\%$	ISO 10545-2
Rectangularity	$\pm 0.5\%$	$\pm 0.2\%$	$\pm 0.1\%$	ISO 10545-2
Surface Flatness	$\pm 0.5\%$	$\pm 0.3\%$	$\pm 0.2\%$	ISO 10545-2
Water Absorption	$\leq 0.50\%$	$\leq 0.06\%$	$< 0.05\%$	ISO 10545-3
Apparent Density	As per Mfg (> 2.0 g/cc)	> 2.20 g/cc	> 2.10 g/cc	ISO 10545-3
Modulus of Rupture (MOR)	Min 35 N/mm ²	Min 40 N/mm ²	Min 40 N/mm ²	ISO 10545-4
Breaking Strength	Min 1,300 N	Min 7,200 N (15mm)	Min 2,000 N	ISO 10545-4
Surface Abrasion	As per Mfg	Min Class 3	Min Class 3 – 4	ISO 10545-7
Mohs Hardness	As per Mfg	Min Class 4 (Mohs 6–7)	Min 4 – 5	BS EN 15771 / EN 101
Frost Resistance	As per Mfg	Frost Proof (Zero damage)	No damage	ISO 10545-12
Thermal Shock Resistance	Min 10 Cycles	Min 10 Cycles (No damage)	No damage	ISO 10545-9
Chemical Resistance	As per Mfg	No Damage	No damage	ISO 10545-13
Fire Resistance	As per Mfg	Fire Proof (Euroclass A1)	Fire proof	DIN 4102 / EN 13501



FORMAT MATRIX

Sheen Slab Format & Pallet Packing Matrix (Image 4)

Complete 16-row reference table matching Image 4: iron pipe pallets, weights, and payload.

The table below provides the full 16-row production and container loading matrix for **Sheen Sintered Slab Tiles** packed on iron pipe pallets (verified 1:1 against Image 4 reference data).

#	Size (mm)	Pcs/Box	Thickness	Pallet Type	Cont.	Box/Plt	Plt/Cont	Boxes/Cont	Kg/Box	M ² /Box	Total M ²	Net Ton	Gross Ton
1	800 x 2400	1 PCS	15 MM	12 Iron Pipe	20 FT	30	12	360	68.5	1.92	691.20	24.66	25.66
2	800 x 3000	1 PCS	15 MM	9 Iron Pipe	40 FT	26	12	312	86.0	2.40	748.80	26.52	27.83
3	800 x 3200	1 PCS	15 MM	12 Iron Pipe	40 FT	25	12	300	90.0	2.56	768.00	27.00	28.00
4	1200 x 2400	1 PCS	15 MM	10 Iron Pipe	40 FT	26	10	260	101.0	2.88	748.80	26.26	27.26
5	1200 x 2800	1 PCS	15 MM	8 Iron Pipe	40 FT	28	8	224	120.0	3.36	752.64	26.88	27.88
6	1200 x 3200	1 PCS	15 MM	9 Iron Pipe	40 FT	22	9	198	135.0	3.84	760.32	26.73	27.73
7	1200 x 3200	1 PCS	12 MM	9 Iron Pipe	40 FT	26	9	234	115.0	3.84	898.56	26.91	27.91
8	1200 x 2400	1 PCS	12 MM	12 Iron Pipe	40 FT	26	12	312	84.0	2.88	898.56	26.20	27.20
9	1200 x 2800	1 PCS	12 MM	10 Iron Pipe	40 FT	30	9	270	97.0	3.36	907.20	26.19	27.19
10	1200 x 2400	1 PCS	9 MM	12 Iron Pipe	40 FT	35	12	420	62.0	2.88	1209.60	26.04	27.04
11	1200 x 2800	1 PCS	9 MM	12 Iron Pipe	40 FT	30	12	360	72.0	3.36	1209.60	25.92	26.92
12	1200 x 3200	1 PCS	9 MM	9 Iron Pipe	40 FT	35	9	315	83.0	3.84	1209.60	26.14	27.14
13	800 x 2400	2 PCS	9 MM	12 Iron Pipe	40 FT	25	12	300	82.0	3.84	1152.00	24.60	25.60
14	1200 x 2400	2 PCS	6 MM	12 Iron Pipe	40 FT	24	12	288	84.0	5.76	1658.88	24.19	25.19
15	1200 x 2800	2 PCS	6 MM	11 Iron Pipe	40 FT	24	11	264	101.0	6.72	1774.08	26.66	27.66
16	1200 x 3200	2 PCS	6 MM	9 Iron Pipe	40 FT	26	9	234	110.0	6.72	1572.48	25.74	26.74



APPLICATIONS

Architectural Applications Landscape Overview

Expansive visual luxury, grout minimization, and thickness selection hierarchy.

1. The Large Format Architectural Advantage

Large format sintered slabs transform architectural spaces by dramatically minimizing grout lines. Replacing a grid of small tiles with monolithic 1200 x 2800 mm or 1200 x 3200 mm panels delivers continuous, expansive visual luxury.

Fewer grout joints eliminate dirt-trapping lines, delivering hospital-grade hygiene in wet environments, private residences, and public facilities.

2. Versatility Across Thicknesses

- **6 mm Slim Slabs:** Lightweight overlay installations, interior wall cladding, elevator cab lining, cabinetry casework doors.
- **9 mm & 12 mm Slabs:** Heavy-duty commercial and residential interior flooring, exterior facades, bathroom wet rooms.
- **15 mm Solid Slabs:** Monolithic kitchen countertops, vanity surfaces, heavy public stairs, bar counters (Image 2 benchmark).

3. Primary Sector Applications

- | | |
|---|--|
| ☐ Continuous Open-Plan Living Floors | ☐ Floor-to-Ceiling Luxury Bathroom Linings |
| ☐ Seamless Kitchen Splashback Walls | ☐ Architectural Fireplace Hearths & Surrounds |
| ☐ Airport & Commercial Mall Concourses | ☐ Exterior Ventilated Rainscreen Facades |

FLOOR-TO-CEILING HEIGHT MATCH

The **1200 x 2800 mm** format matches standard residential ceiling heights (2.8m), allowing vertical wall installations with zero horizontal joints.





FLOOR SYSTEMS

Residential Seamless Flooring & Radiant Heating

Living room floor expanses, underfloor heating conductivity, and perimeter expansion.

1. Open-Plan Living Room Flooring

Installing large format porcelain slabs (e.g., 1200 x 2400 mm, 800 x 2400 mm) on open-plan residential floors creates seamless continuity between living rooms, dining spaces, and kitchens.

Because grout lines are spaced 1.2 or 2.4 meters apart, the eye perceives a unified stone expanse rather than a tiled grid.

2. Underfloor Radiant Heating Systems

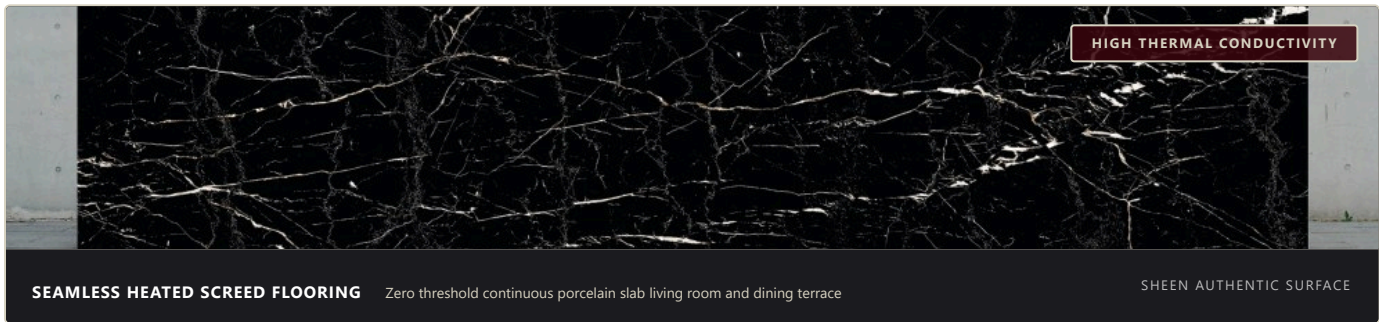
Sintered porcelain has excellent thermal conductivity ($\lambda \approx 1.3 \text{ W/mK}$), making it the ideal finish over radiant hydronic or electric underfloor heating systems. It transfers heat rapidly and stores warmth efficiently.

3. Residential Flooring Standards

Installation Parameter	Specification
Recommended Thickness	9 mm or 12 mm
Minimum Joint Width	Min 2.0 mm (Never butt-joint)
Adhesive Classification	ISO 12004 C2TE S1 Deformable
Perimeter Expansion Gap	Min 6.0 mm along all baseboard walls

UNDERFLOOR HEATING COMMISSIONING

Turn off radiant underfloor heating at least 48 hours prior to tiling. Keep heating off for at least 21 days after grouting to allow adhesive mortar to cure without moisture loss.





WET ROOM DESIGN

Luxury Bathroom & Shower Wall Wet Lining

Full-height shower lining, waterproofing integration, and linear drain slopes.

1. Floor-to-Ceiling Bathroom Slabs

Large format sintered slabs have revolutionized luxury bathroom design. A standard residential shower enclosure (900 x 1200 mm or 1000 x 1500 mm) can be lined using just three full-height slabs (1200 x 2800 mm), eliminating 95% of traditional grout joints.

With near-zero water absorption ($\leq 0.06\%$), moisture cannot penetrate the slab body, completely preventing mold, mildew, and calcium efflorescence staining.

2. Waterproofing Integration

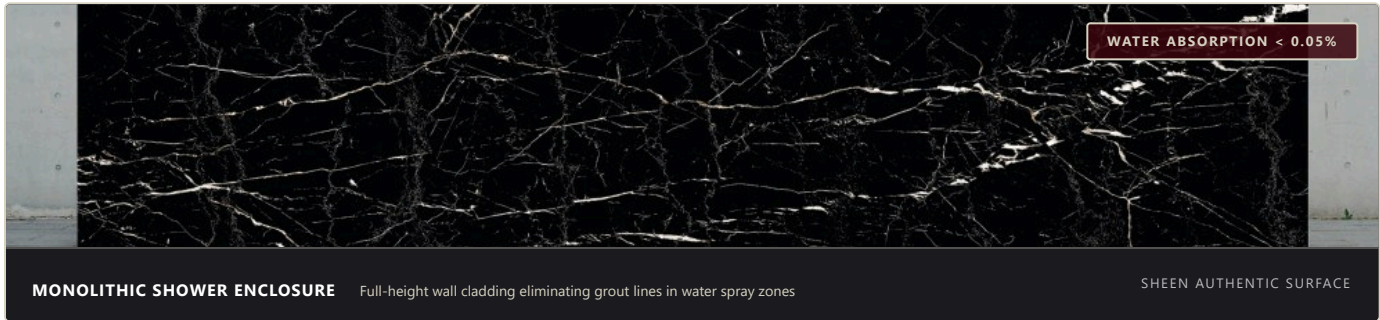
Sintered slabs are waterproof, but the substrate joints are not. Slabs must be installed over certified liquid-applied waterproofing membranes (ANSI A118.10) with elastomeric sealing bands at all corner changes.

3. Shower Enclosure Specification

Enclosure Component	Specification Standard
Wall Slab Thickness	6 mm Slim or 9 mm
Shower Pan Floor	9mm / 12mm with R10 Anti-Slip Finish
Corner Joints	100% Mildew-Resistant Sanitary Silicone
Drain Floor Slope	Min 1.5% to 2.0% fall to linear drain

HYGIENE CERTIFICATION

Resistant to shampoo surfactants, body washes, and bleach bathroom cleaners without chemical etching.





KITCHEN SURFACES

Kitchen Splashbacks & Island Counter Cladding

Grout-free splashbacks, heat resistance behind gas burners, and island gable trims.

1. Seamless Kitchen Splashback Walls

A single 1200 x 3200 mm slab cut longitudinally provides two continuous 600 x 3200 mm kitchen splashbacks. This creates a grout-free, grease-resistant vertical surface spanning seamlessly behind the cooktop and prep sink.

Cooking oil splatters and tomato sauces wipe off effortlessly with warm water and soap; zero grout joints mean grease never soaks into porous seams.

2. Cabinet Island End Gable Cladding

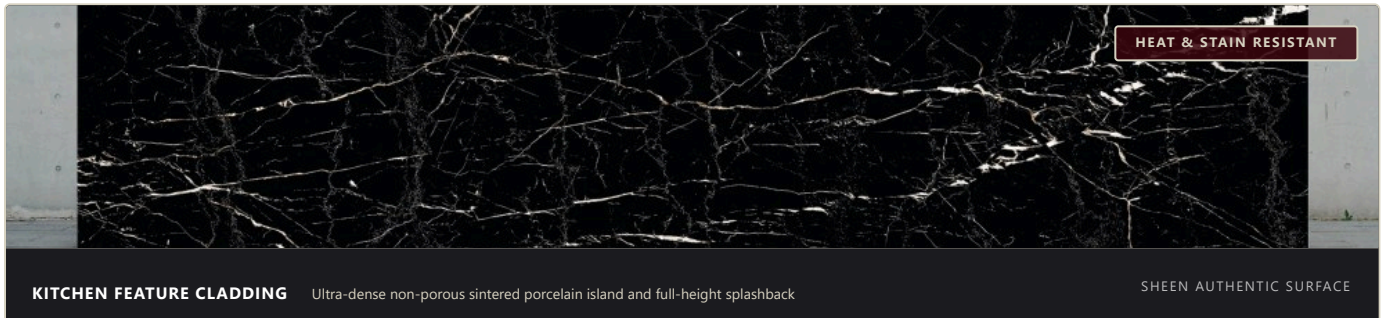
6mm and 9mm sintered slabs can be laminated directly over kitchen island cabinetry end panels, matching the backsplash and creating architectural unity across the open kitchen space.

3. Cooktop Heat Resistance

UNRESTRICTED COOKTOP HEAT RESISTANCE

Unlike engineered quartz, which contains polymer resins vulnerable to thermal shock, **sintered porcelain slabs are 100% mineral-vitrified**. They withstand direct open gas flame heat, hot oil splatters, and boiling steam behind cooktops with zero risk of scorching or color shift.

Application	Recommended Thickness
Vertical Splashback Run	6 mm Slim or 9 mm
Island Cabinet Gable Cladding	6 mm Slim
Solid Countertop Surface	12 mm or 15 mm (Image 2 standard)





FEATURE WALLS

Feature Walls, Fireplace Surrounds & TV Accents

Bookmatched statement walls, fireplace heat resistance, and cement board substrates.

1. Architectural Statement Walls

Bookmatched marble sintered slabs (e.g., Calacatta Luxe, Statuario Imperial) are widely specified as monumental TV feature walls, hotel lobby backdrops, and double-height living room walls.

6mm slabs weigh only ~18 kg/m², allowing high vertical wall installations with standard C2TE S1 adhesive without exceeding drywall framing load limits.

2. Fireplace Surrounds & Mantels

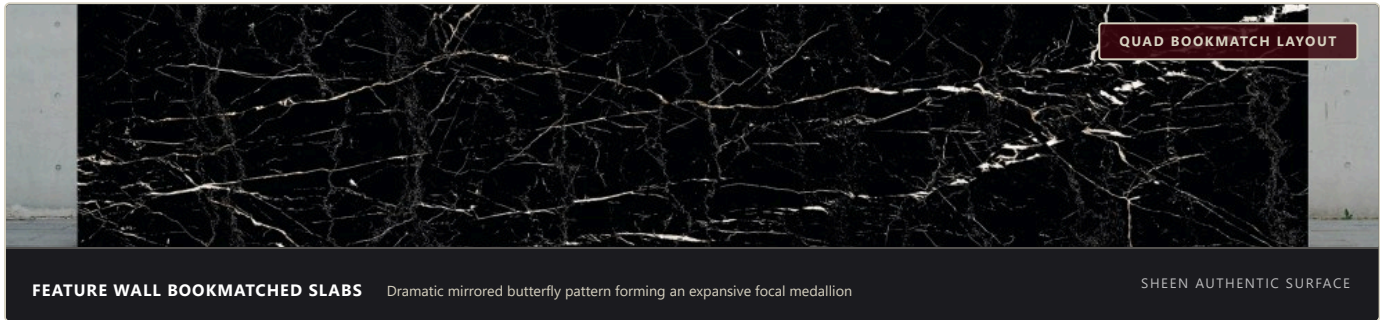
Because sintered porcelain is classified **Euroclass A1 Non-Combustible** (DIN 4102-A1), slabs can be installed directly adjacent to gas, electric, or wood-burning fireplace inserts without heat degradation.

3. Fireplace Installation Rules

Component	Engineering Standard
Substrate Material	Cement Backer Board (Permabase, HardieBacker)
Mortar Classification	High-temperature C2TE S1/S2 adhesive
Corner Treatment	45° mitered jolly corners with epoxy joint
Firebox Air Clearance	Min 6 mm perimeter soft joint filled with silicone

CONCEALED LED COVE LIGHTING

Incorporate a 20mm shadowline gap at the ceiling and perimeter baseboard, concealing LED ambient strip lighting that highlights the stone veining texture.





COMMERCIAL FLOORS

Commercial, Hospitality & High-Footfall Arenas

Breaking strength > 7200 N, vehicular rolling wheel loads, and 16 m² movement bays.

1. Extreme Traffic Performance

In airports, shopping centers, railway terminals, and luxury automobile showrooms, floors endure heavy rolling wheel loads, luggage trolley wheels, and millions of pedestrian footfalls.

Sheen 12mm and 15mm sintered slabs deliver breaking strength exceeding **7,200 Newtons** and Modulus of Rupture over **40 N/mm²**, far exceeding natural granite. Properly bedded slabs will not crack under vehicular wheel traffic.

2. Rolling Load Capacity

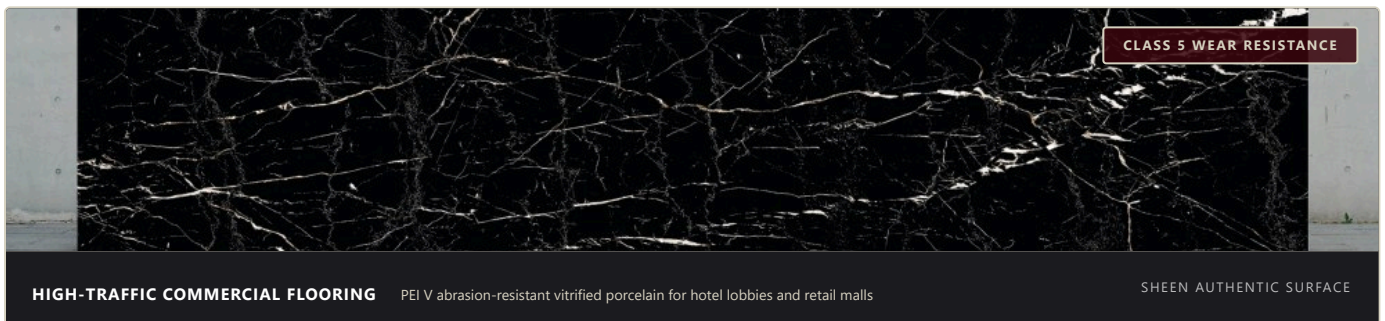
Slab longevity under heavy rolling loads depends 100% on achieving a **solid void-free mortar bed (100% coverage)**. A hollow void beneath a slab will cause immediate punch-through fracture under a hard nylon cart wheel.

3. Commercial Traffic Standards

Commercial Sector	Recommended Thickness	Joint Width
Hotel Lobbies / Corporate Atriums	9 mm or 12 mm	3.0 mm (C2TE S1)
Shopping Malls / Airports	12 mm or 15 mm	4.0 mm – 5.0 mm (C2TE S2)
Automobile Showrooms	12 mm or 15 mm	4.0 mm (100% Solid Bed)
Exterior Pedestrian Plazas	15 mm Heavy	5.0 mm (S2 Adhesive)

DYNAMIC MOVEMENT JOINTS

In large commercial open areas, install structural movement joints dividing the floor into maximum **4.0 x 4.0 meter bays (16 m²)**.





RETAIL FIT-OUTS

Retail Stores & Corporate Headquarters Flooring

High-traffic scuff immunity, rapid-setting adhesives, and tile-over-tile overlay.

1. Retail Boutique Design Language

Luxury retail brands demand flawless, high-gloss or satin monolithic floor finishes that create an ultra-clean backdrop for premium merchandise.

Using 1200 x 2400 mm or 1200 x 2800 mm slabs minimizes visual joint distraction, directing consumer focus entirely toward displayed goods.

2. Stain & Scuff Resistance

Coffee spills, wet umbrella water, spilled perfumes, and black rubber shoe heel marks do not penetrate the dense sintered porcelain surface. Daily maintenance requires only automatic floor scrubbers with neutral detergent.

3. Fast-Track Overnight Installation

Retail renovation schedules often require fast-track overnight installation. Utilizing **rapid-setting C2FE S1 adhesives** allows grout application within 4 to 6 hours and full pedestrian re-opening within 24 hours.

TILE-OVER-TILE RENOVATION

In retail tenant fit-outs, 6mm slim porcelain slabs can be installed directly over sound existing ceramic tile floors using a specialized bonding primer, eliminating noisy and messy demolition.





EXTERIOR FACADES

Exterior Ventilated Facades & Rainscreen Cladding

Ventilated air cavities, Keil undercut anchors, wind loads, and fiberglass safety mesh.

1. Ventilated Rainscreen Facade Physics

Sintered porcelain slabs represent the premier exterior cladding material for modern building envelopes. In a **ventilated facade system**, slabs are mounted off the structural building wall with an air cavity between the insulation and the rear slab face.

Stack-effect air circulation within the ventilation cavity continuously removes moisture, significantly improves building thermal insulation, and prevents thermal bridge energy losses.

2. Mechanical Fixing Systems

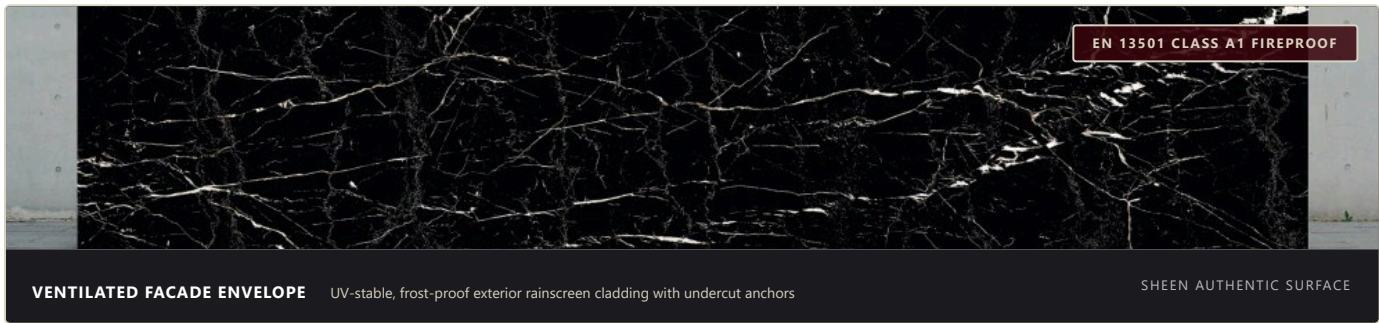
- **Concealed Mechanical Anchors:** Stainless steel undercut anchors (Keil anchors) drilled into the slab reverse, hanging on aluminum horizontal rails.
- **Exposed Safety Clips:** Stainless steel visible clips clamping slab edges.
- **Chemical-Structural Adhesive:** Structural silicone/polyurethane bonding paired with concealed mechanical fall-arrest safety clips.

3. Exterior Engineering Standards

Facade Parameter	Engineering Requirement
Wind Load Resistance	Tested up to $\pm 3,000$ Pa wind pressure
Recommended Thickness	9 mm or 12 mm with safety mesh
Safety Mesh Backing	Epoxy-bonded fiberglass mesh on reverse
Ventilation Cavity Depth	Min 30 mm – 50 mm clear airspace

SAFETY MESH MANDATE

All exterior cladding slabs installed above 3.0 meters elevation **MUST** feature factory-applied fiberglass safety mesh backing to retain fragments in the event of accidental missile impact.





MATERIAL STABILITY

Thermal, Frost & Fire Resistance Performance

Freeze-thaw immunity, Euroclass A1 non-combustible rating, and low thermal expansion.

1. Freeze-Thaw & Frost Proof Science

Frost damage occurs when porous ceramic materials absorb liquid water that expands by 9% when freezing into ice, fracturing the tile from within.

With verified water absorption below **0.06%**, Sheen Sintered Slabs are 100% frost proof. Slabs undergo 100 consecutive freeze-thaw cycles between -20°C and +20°C (ISO 10545-12) with zero cracking, spalling, or flexural strength loss.

2. Euroclass A1 Fire Reaction

Certified **Euroclass A1 Non-Combustible** under EN 13501-1. Slabs will not ignite, fuel flames, or emit toxic smoke or burning droplets even when subjected to direct building fire conditions exceeding 1,000°C.

3. Thermal Expansion (CTE) Metrics

Thermal Property	Test Standard	Performance Result
Linear Thermal Expansion	ISO 10545-8	Max $6.0 \times 10^{-6} \text{ K}^{-1}$ (Extremely low)
Thermal Shock Resistance	ISO 10545-9	Min 10 cycles (No damage)
Frost Resistance	ISO 10545-12	Fully Frost Proof
Fire Reaction Rating	EN 13501-1	Class A1 / A1fl (Non-combustible)

THERMAL STABILITY ADVANTAGE

Low coefficient of thermal expansion ($6.0 \times 10^{-6} \text{ K}^{-1}$) prevents buckling and bowing under severe summer sun exposure on dark facade panels.



SECTION 2 • SLAB INSTALLATION DIVISION

MATERIAL HANDLING & LOGISTICS

Container receiving, crate uncrating, vacuum handling frames, A-frame storage, and slim slab safety.

KEY TECHNICAL MODULES IN THIS SECTION:

- Container receiving and pallet damage inspection protocols
- Multi-cup vacuum handling frames and aluminum crossbars
- Jobsite A-frame vertical storage angle (80° to 85°) & bearer specs
- Specialized handling procedures for 6mm slim porcelain slabs



FEATURED DESIGN: RALPH NATURAL • 4-WAY CONTINUOUS VEIN VILLA LOBBY CLADDING



SITE INTAKE

Receiving Sintered Slabs at Jobsite

Heavy pallet handling, forklift tine extensions, and crane unloading logistics.

1. Site Ingress Logistics & Unloading

Large format slabs arrive packed on heavy steel pipe pallets or enclosed timber crates measuring up to 3.4 meters in length. A single pallet carrying twenty 1200x3200mm slabs weighs over 2.7 metric tons.

Verify site ingress access before delivery. Unloading requires heavy forklifts with extended 2.0-meter fork tines, telehandlers, or mobile truck-mounted knuckle cranes (Hiab cranes).

2. Forklift Tine Spacing Rules

Spread forklift tines to their widest setting (at least 1.4 meters apart) and lift from the center of the pallet to prevent balance tipping.

3. Unloading Site Requirements

Equipment	Minimum Specification
Forklift Capacity	Min 3.5 Ton Capacity at 1.2m load center
Fork Tine Length	Min 1,800 mm – 2,000 mm (Support pallet width)
Ground Surface	Firm concrete or asphalt; no soft mud / gravel
Overhead Clearance	Min 4.0 meters clear of overhead utility wires

CENTER OF GRAVITY HAZARD

Never attempt to lift 3.2-meter slab pallets using short standard 1.1-meter forklift forks; the pallet will flip forward.



INTAKE INSPECTION

Delivery Inspection & Verification Protocols

Freight survey, carton label cross-matching, shade lots, and 14-day claims window.

1. Intake Crate Survey

Prior to signing delivery manifests, inspect every crate and iron pipe pallet while still on the transport vehicle. Examine the external strapping, wood bearers, and corner protection caps.

Document any crushed timber, broken banding, or crate tilt with date-stamped digital photographs.

2. Box Label Verification

Check the factory label printed on each slab box:

- Series Name & Color (e.g., Concrete Grey, Statuario Imperial).
- Nominal Size & Calibrated Thickness (e.g., 1200x3200x12mm).
- Shade / Tone Code (All boxes must share the exact same shade lot).
- Caliber Code (Dimensional sizing tolerance code).

3. Delivery Sign-Off Form

- | | |
|---|--|
| ☐ Verify Total Pallet Count vs Waybill | ☐ Inspect Steel Strapping Tension |
| ☐ Confirm Shade & Caliber Codes Match | ☐ Check for Edge Corner Impact Shocks |
| ☐ Record Exceptions on Carrier POD | ☐ Notify Sheen Logistics within 14 Days |

CLAIMS WINDOW NOTICE

Claims for freight damage or quantity discrepancies must be filed within 14 calendar days supported by uncrating photographs.



PACKAGING DESIGN

Packaging Integrity — Iron Pipe Pallets vs Crates

Tubular iron pipe A-frame pallets, enclosed plywood crates, and strapping safety.

1. Iron Pipe Pallets (Heavy Duty)

For international containerized shipping, Sheen utilizes heavy-duty iron pipe pallets (tubular steel welded frame with wooden base). Slabs are secured vertically leaning at 8° on both sides of the central A-tower.

Iron pipe pallets withstand ocean container pitching without flexing, providing maximum protection for 12mm and 15mm monolithic slabs.

2. Enclosed Timber Crates

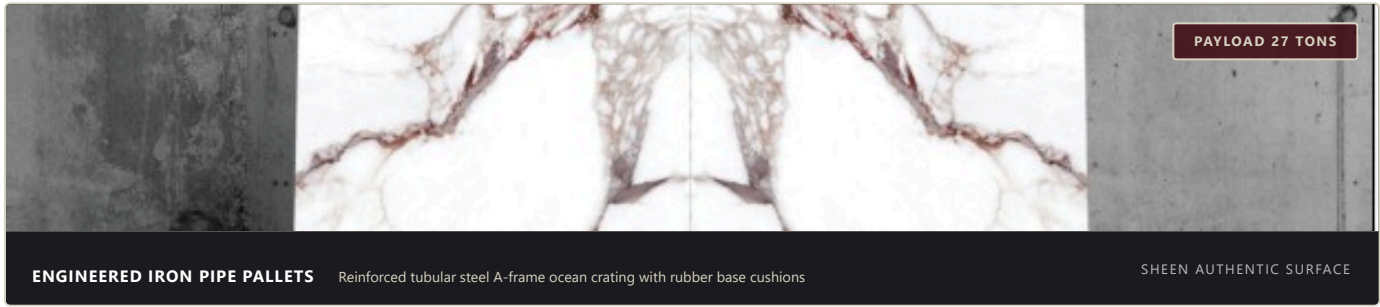
Enclosed ISPM-15 fumigated timber crates are used for smaller shipments and thin 6mm slim slabs. Slabs rest on dense foam runners and are boxed on all four sides with 18mm plywood sheeting.

3. Packaging Selection Matrix

Slab Category	Export Packaging System	Tare Weight
15mm Slabs (1200x3200)	9 Iron Pipe A-Frame Pallet	~ 220 kg
12mm Slabs (1200x3200)	9 Iron Pipe A-Frame Pallet	~ 220 kg
9mm Slabs (1200x2400)	12 Iron Pipe A-Frame Pallet	~ 180 kg
6mm Slim Slabs (1200x3200)	Reinforced Enclosed Wood Crate	~ 260 kg

STEEL STRAPPING SAFETY

Cut strapping with high-leverage shears standing to the side of the tension band. Never stand directly in front of the leaning slab face.





UNCRATING PROTOCOL

Safe Uncrating & Pallet Unpacking Operations

Tension strapping release, retention arms, and symmetrical A-frame unloading.

1. The Safe Uncrating Sequence

Uncrating large format slabs requires a methodical step-by-step sequence to avoid slab tipping:

- Place the pallet on a flat, level concrete surface (slope < 0.5%).
- Install temporary mechanical retention arms or safety ratchet straps across the face of the slabs before cutting shipping bands.
- Cut steel bands one at a time, keeping hands clear of spring-back.
- Remove protective corner cardboard caps and foam spacers.
- Extract slabs one by one using a multi-cup vacuum lifting frame.

2. The "Balance Symmetrical" Rule

UNLOAD SIDES SYMMETRICALLY

When unloading dual-sided A-frame pallets, **NEVER unload all slabs from one side first**. Unloading one side completely creates severe weight imbalance, causing the A-frame pallet to tip over backwards. Unload in alternating pairs: two slabs from Side A, then two slabs from Side B.

Step Order	Unloading Action
Step 1 & 2	Remove 2 Slabs from Left Side
Step 3 & 4	Remove 2 Slabs from Right Side
Step 5 & 6	Repeat alternating pattern until pallet is empty



HOISTING RIGGING

Mechanical Handling — Cranes & Forklift Booms

Crane lifting cages, tag line guidance, wind speed limits, and sling angles.

1. Crane Hoisting Systems

On multi-story construction sites, slabs must be hoisted into upper floor window openings using tower cranes, mobile knuckle cranes, or exterior construction hoists.

Slabs must be hoisted in their original steel transport pallets or transferred to certified jobsite crane lifting cages. Slabs must NEVER be hoisted using open web slings wrapped directly around raw stone edges.

2. Tag Line Guidance

Always attach two long fiber rope tag lines to opposite corners of the lifting frame. Ground personnel use tag lines to guide and orient the suspended load without placing their hands or bodies beneath the suspended slab.

3. Hoisting Safety Standards

Equipment Parameter	Safety Specification
Crane Sling Angle	Min 60° from horizontal (Equal leg tension)
Wind Speed Limit	Max 25 km/h (Cease lifting in gusty winds)
Exclusion Zone	Radius equal to lifting height + 5 meters
Safety Latch Hooks	Mandatory spring-loaded safety latches on all hooks

DYNAMIC WIND SAIL HAZARD

A 1200 x 3200 mm slab acts like an immense sail in crosswinds. Gusts exceeding 25 km/h can rip the slab from suction frames or slam it against scaffolding.



VACUUM FRAMES

Multi-Cup Vacuum Handling Frames & Telescopic Beams

Technical vector diagram: 8-cup vacuum frame, aluminum crossbars, and pump indicators.

A certified multi-cup vacuum carrying frame (e.g., Raimondi Easy-Move, Montolit Superstick) is an indispensable tool for large format slab installation. The frame keeps the flexible slab rigid, preventing flexural snapping during movement.

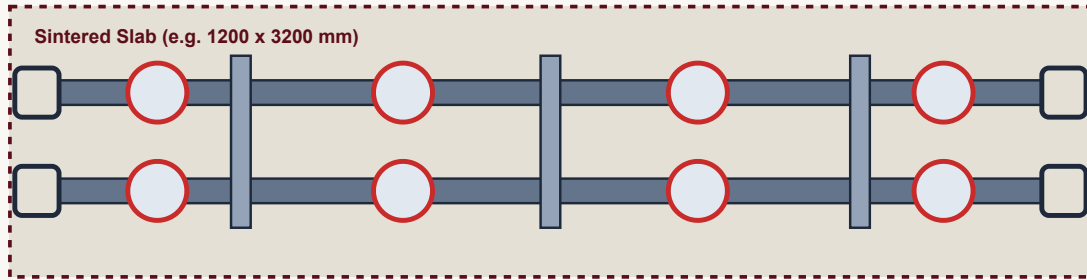
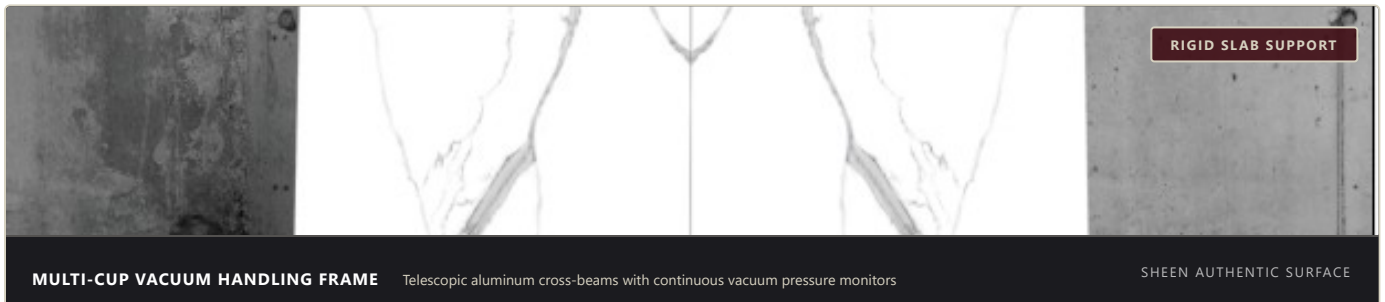


FIGURE 2.1 — MULTI-CUP VACUUM HANDLING FRAME WITH TELESCOPIC ALUMINUM RAILS & PRESSURE GAUGES

Vacuum Cup Placement: Engage at least 6 to 8 pump-action vacuum cups spaced evenly along the slab length. Vacuum plungers must show the safety indicator line fully engaged inside the pump cylinder.

Telescopic Aluminum Beams: Adjust the sliding crossbars to reinforce cutouts or narrow sections before lifting the slab off the A-frame.





FRAME DYNAMICS

Rigid Carrying Frames & Operator Dynamics

Team movement coordination, tilting wheel carts, and textured surface vacuum pads.

1. Operating with Carrying Frames

Carrying frames transform a fragile, heavy slab into a rigid, manageable unit with ergonomic handles for a 4-person installation crew.

Team leaders must coordinate every movement with clear vocal commands: "LIFT on three... WALK forward... LOWER." Slabs must be carried in an upright, slightly inclined vertical position.

2. Navigating Vertical to Horizontal

Most frames feature pivoting wheels and fold-out support legs, allowing the crew to roll the slab down hallways and tilt it horizontally directly over the adhesive mortar bed without manual strain.

3. Frame Maintenance Protocols



Clean Rubber Suction Pads with Alcohol



Inspect Vacuum Release Valves for Grit



Tighten Telescopic Beam Lock Levers



Check Swivel Handle Rubber Grips



Test Suction Hold on Test Scrap for 10 Min



Lubricate Pump Plunger O-Rings with Silicone

TEXTURED SLABS & VACUUM GRIP

For textured, carved, or slate finishes, use specialized vacuum cups with micro-foam soft perimeter rings that conform to surface fissures.



JOBSITE STORAGE

Jobsite Vertical A-Frame Storage Standards

80°–85° lean angle geometry, timber bearers, and subfloor load spreader sheets.

1. Jobsite Temporary Storage Standards

Upon uncrating, slabs awaiting installation must be stored on heavy-duty jobsite transport A-frames. Slabs must NEVER be leaned loose against finished drywall, hollow partition studs, or temporary scaffolding.

The A-frame must maintain a certified lean angle between **80° and 85° from horizontal**. Slabs placed steeper than 85° can tip forward if bumped; slabs shallower than 80° introduce excessive flexural sagging.

2. Floor Load Bearing Check

Verify that the jobsite subfloor can support the concentrated weight of the A-frame cart. On timber joist subfloors, place thick 25mm plywood load-spreader sheets beneath A-frame caster wheels.

3. Storage Geometry Parameters

Storage Parameter	Certified Field Standard
Lean Angle from Horizontal	80° to 85° (5° to 10° from vertical)
Base Bearer Material	Hardwood topped with 10mm Neoprene Rubber
Max Slabs per A-Frame Side	6 Slabs (12mm/15mm) • 10 Slabs (6mm)
Face Protection	Clean corrugated plastic or foam spacers between faces

WINDY CORRIDOR PRECAUTIONS

If storing A-frames near open window bays or breezeways, secure slabs with ratchet safety straps to prevent wind-induced tipping.



EDGE PROTECTION

Timber Bearers & Edge Cushion Protection

Neoprene rubber bearers, plastic corner protector boots, and floor screw hazards.

1. Bottom Edge Impact Vulnerability

Sintered porcelain is hardest across its glazed surface face, but its bottom calibrated edges are vulnerable to point-load impact chipping if set directly onto bare concrete, screws, or stone grit.

Base ledges of all storage racks and transport carts must be lined with continuous **hardwood bearers topped with 10mm high-density EPDM rubber strips**.

2. Plastic Corner Protectors

Whenever moving slabs through doorways or tight hallways, install heavy-duty **polyethylene corner protector caps** on all four slab corners. This prevents corner blowouts if a slab gently bumps a doorframe.

3. Edge Cushion Standards

Component	Approved Material
Rack Base Ledge	10mm High-Durometer Neoprene Rubber
Corner Protectors	Heavy-gauge molded plastic corner boots
Face-to-Face Spacers	2mm Polyethylene closed-cell foam sheets

CLEAN FLOOR RULE

Sweep all concrete floor paths clean of drywall screws, nails, and gravel before wheeling slab transport carts across the site.



INGRESS GEOMETRY

Navigating Stairs, Corridors & Elevators

Corridor 90° turn clearances (3.45m diagonal), elevator limits, and stair carrying rules.

1. Site Route Survey Protocols

Before transporting 3.2-meter slabs into a building, conduct a walk-through route survey measuring all doorways, turning corners, hallway ceiling heights, and elevator dimensions.

A 1200 x 3200 mm slab requires a minimum diagonal clearance of **3.45 meters (11.3 feet)** to rotate around a standard 90° corridor junction.

2. Elevator Transport Rules

Standard passenger elevators cannot accommodate 3.2m slabs horizontally or vertically. Verify service elevator cab diagonal dimensions. If elevator transport is impossible, slabs must be hoisted externally through facade windows.

3. Stairway Carrying Protocol

STAIRWAY ROTATION WARNING

Carrying 3.2m slabs up switchback staircases is hazardous. When navigating stairs, the carrying frame must be held strictly on-edge, with two workers on the downhill side and two workers uphill. Use spotters at stair landings.

Route Obstacle	Minimum Required Clearance
Doorway Width	Min 900 mm (Pass slab vertically on-edge)
Corridor 90° Turn	Min 1,800 mm corridor width
Ceiling Height at Turns	Min 2,800 mm vertical clearance



SLIM SLAB HANDLING

Handling Thin Porcelain Slabs (6mm Slim Series)

6mm flexural dynamics, mandatory rigid frames, and center sag prevention.

1. The Flexibility of 6mm Slabs

Thin 6mm sintered porcelain slabs (e.g., 1200x2800x6mm, 1200x3200x6mm) possess remarkable flexural elasticity. While strong in tension, unsupported 6mm slabs will bow significantly under their own weight if lifted without a rigid carrying frame.

Excessive dynamic flexure (flapping) during transport induces catastrophic transverse snapping across the center of the slab.

2. Carrying Frame Mandate for 6mm Slabs

A RIGID CARRYING FRAME WITH AT LEAST TWO CROSSBARS IS MANDATORY FOR ALL MOVEMENTS OF 6MM SLABS. Never attempt to carry an unbraced 6mm slab by hand with suction cups alone.

3. 6mm Handling Rules Summary



Attach Frame Before Lifting from Crate



Lock Longitudinal Telescopic Beams Rigid



Attach Center Crossbars to Prevent Sag



Lift Smoothly; Zero Rapid Jerking Movements



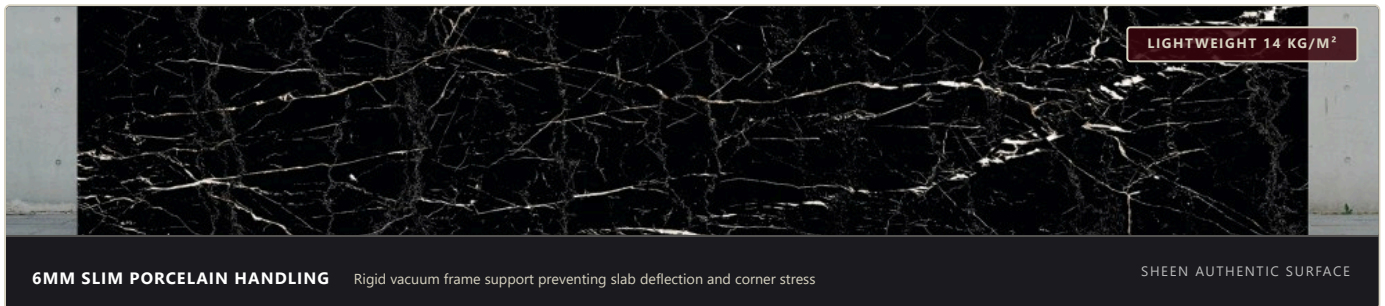
Keep Frame Attached Until Placed in Mortar



Never Twist or Torsion the Frame

CUTOUTS ON 6MM SLABS

Never cut large sink or cooktop openings in 6mm slabs off-site before transport. Execute cutouts on site, or reinforce the opening with clamped crossbars.





SECTION 3 • SLAB INSTALLATION DIVISION

SUBSTRATE ASSESSMENT & SITE PREPARATION

Structural soundness, flatness standards (< 2mm over 2m), moisture testing, decoupling, and primers.

KEY TECHNICAL MODULES IN THIS SECTION:

- Substrate structural deflection criteria (L/720) and load capacities
- Surface flatness tolerances: DIN 18202 / ANSI A108.19 (< 2mm over 2m)
- Screed moisture limits (CM < 2.0%) and curing time windows
- Crack isolation decoupling membranes, primers, and movement joints



FEATURED DESIGN: CEMENT GREY MATT • ARCHITECTURAL BRUTALIST SURFACE FLATNESS DIN 18202



SUBSTRATE CRITERIA

Substrate Structural Soundness & Load Bearing

L/720 deflection criteria, 25 N/mm² screed compressive strength, and scratch tests.

1. The Principle of Substrate Dependency

Because sintered porcelain slabs are rigid, non-deformable mineral plates, they cannot bridge voids or absorb substrate deflection. The installed floor or wall is only as sound as the substrate directly beneath it.

The substrate must be completely stable, structurally rigid, dry, load-bearing, and free from cracks, voids, dust, grease, or chemical release agents.

2. Structural Deflection Limits (L/720)

In accordance with **ANSI A108.19** and **TCNA guidelines**, substrates supporting large format slabs must have a maximum live-and-dead load deflection not exceeding **L / 720** (span length divided by 720). Standard ceramic tile deflection (L/360) is completely unacceptable and will crack large slabs.

3. Substrate Soundness Audit Checklist

- | | |
|--|---|
| ☐ Compressive Strength ≥ 25 N/mm ² (Screed) | ☐ Tensile Pull-Off Bond ≥ 1.5 N/mm ² |
| ☐ Deflection Limits Checked ($\leq$ L/720) | ☐ No Loose Flaking or Crumbly Laitance |
| ☐ No Structural Hollow Cavities on Tapping | ☐ Subfloor Plywood Double-Layer (Min 32mm) |

THE SCRATCH & HAMMER TEST

Scratch concrete screed with a hardened steel nail in a grid pattern. If the concrete crumbles or powdery sand breaks away, the screed has poor binder cohesion and must be primed with consolidating epoxy primer.



SUBSTRATE FAMILIES

Substrate Types — Screeds, Concrete & Boards

Cement screeds, cement backer boards, existing tiles, and OSB/gypsum bans.

1. Approved Substrate Categories

Large format slabs can be installed across four primary substrate families when properly primed and prepared:

- **Cementitious Screeds & Concrete Slabs:** Most common for floors. Must be fully cured, flat, and shot-blasted to remove laitance.
- **Rendered Masonry & Solid Brick Walls:** Plumb and flat cement-sand render cured for at least 21 days.
- **Cement Backer Boards (ANSI A118.9):** Minimum 12.5mm (1/2") cement boards (HardieBacker, WonderBoard) fastened every 200mm to structural steel/wood studs.
- **Sound Existing Ceramic / Stone Tiles:** Heavily degreased, abraded, and coated with specialized polymer grip primer.

2. Prohibited Substrates

NEVER TILE DIRECTLY OVER GYPSUM OR OSB

STRICTLY PROHIBITED SUBSTRATES: Raw gypsum plaster, standard drywall in wet areas, OSB (Oriented Strand Board), particleboard, asphalt screeds, or vinyl sheet flooring. Gypsum softens when damp; OSB swells and delaminates.

Substrate	Minimum Thickness	Curing Window
Cement Screed	Min 40 mm bonded / 65 mm floating	Min 28 Days
Concrete Slab	Min 100 mm structural slab	Min 90 Days
Cement Board	Min 12.5 mm on walls	Immediate



FLATNESS TOLERANCE

Surface Flatness Standards (< 2mm over 2m)

Technical vector diagram: DIN 18202 / ANSI A108.19 2-meter straightedge test.

Because large slabs have virtually zero flexibility, substrate flatness is the most critical parameter on the jobsite. Any substrate bump or depression will cause severe lippage, hollow voids, or cracked corners.



FIGURE 3.1 — SUBSTRATE FLATNESS 2-METER STRAIGHTEDGE TOLERANCE TEST (< 2.0 MM MAX GAP)

The 2-Meter Rule: In accordance with **DIN 18202 Table 3 Line 4** and **ANSI A108.19**, the maximum gap beneath a 2.0-meter rigid straightedge must not exceed **2.0 mm (1/16")** in any direction.

Mandatory Self-Leveling: If substrate gaps exceed 2.0 mm, the installer **MUST** apply a high-strength, polymer-modified self-leveling compound (compressive strength > 30 MPa) over a suitable bonding primer.



MOISTURE TESTING

Screed Moisture Content Testing & Curing Windows

Calcium carbide (CM) test standards, 28-day curing windows, and anhydrite rules.

1. Residual Moisture Hazards

Trapping excess residual water beneath non-porous sintered porcelain slabs prevents cementitious adhesives from curing properly, generates alkaline vapor pressure, and causes adhesive bond hydrolysis.

New cement screeds require a minimum curing period of **28 days** (1 week per centimeter of screed thickness) under standard climate conditions (20°C / 65% RH) before tiling.

2. Carbide Moisture Meter (CM Test)

The Calcium Carbide Method (CM test) is the only legally binding test for screed moisture in Europe. Sample concrete crushed from the bottom third of the screed is mixed with carbide reagent in a sealed pressure vessel.

3. Maximum Permissible Moisture Table

Substrate Screed Type	Max Allowable Moisture (CM Test)	Electronic Relative Humidity
Cement Screed (Unheated)	≤ 2.0% CM	≤ 75% RH
Cement Screed (Heated Radiant)	≤ 1.8% CM	≤ 70% RH
Anhydrite / Gypsum Screed	≤ 0.5% CM	≤ 60% RH
Anhydrite (Heated Radiant)	≤ 0.3% CM	≤ 55% RH

ANHYDRITE SCREED LAITANCE SANDING

Calcium sulfate (anhydrite) screeds form a soft, powdery laitance crust on their surface. This laitance crust **MUST** be machine sanded away and vacuumed before applying an epoxy moisture barrier.



DECONTAMINATION

Substrate Decontamination & Surface Cleaning

Diamond grinding laitance removal, degreasing, and industrial HEPA vacuuming.

1. Decontamination Requirements

Adhesives bond mechanically by anchoring into open microscopic pores of the concrete substrate. Any barrier substance will prevent chemical keying, causing delamination.

Thoroughly inspect the substrate for bond-breaking contaminants:

- Concrete formwork oil and paraffin curing compounds.
- Plastering overspray, drywall joint mud, and latex paint drips.
- Oily mechanic residues, grease, tar, and food stains.
- Airborne silica dust and masonry fines.

2. Mechanical Abrasion & Cleaning



Mechanical Diamond Grinding or Shot Blasting



Remove Curing Compounds to Bare Aggregate



Degrease Oil Spots with Tri-Sodium Phosphate



Industrial HEPA Vacuuming (Zero Loose Dust)



Damp Sponge Wipe (No Ponding Water)



Apply Penetrating Primer Immediately

THE "SWEEPING IS NOT ENOUGH" RULE

Dry sweeping leaves microscopic dust fines that act like graphite powder, cutting adhesive bond strength by 70%. ALWAYS use an industrial HEPA vacuum.



DECOUPLING SYSTEMS

Substrate Crack Bridging & Decoupling Membranes

Schluter Ditra systems, uncoupling mechanics, and radiant heat substrate safety.

1. The Physics of Decoupling

Concrete screeds continuously shrink, cure, and experience thermal movement over time. When a rigid 3.2-meter sintered slab is bonded directly to a green screed, subfloor tension transfers directly into the tile, causing reflective cracks.

An **unbonded crack-isolation decoupling membrane** (e.g., Schluter Ditra, Dural Durabase CI) mechanically uncouples the tile covering from the substrate. Air channels allow independent substrate movement without shearing the slab.

2. When Decoupling is Mandatory

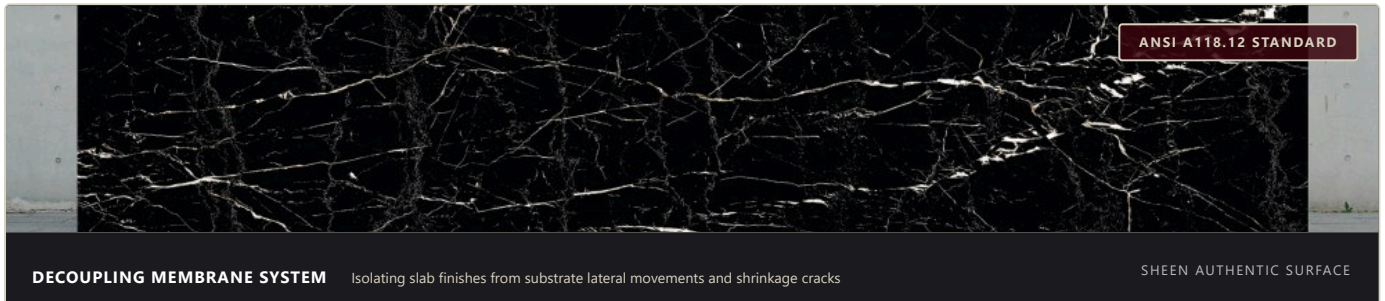
- Over all underfloor radiant heating screeds.
- Over green concrete cured less than 90 days.
- Over timber joist subfloors and tongue-and-groove boards.
- Over substrates exhibiting non-structural hairline shrinkage cracks (< 2.0 mm width).

3. Decoupling Membrane Installation

Step	Installation Protocol
1. Mortar Bed	Combed C2TE S1 mortar using 6x6mm square notch trowel
2. Embed Sheet	Embed fleece webbing into fresh mortar; roll flat with weighted roller
3. Tiling Layer	Fill membrane square cavities completely with C2TE S1/S2 mortar

VAPOR PRESSURE EQUALIZATION

Decoupling membranes feature open interconnected underside grid channels that allow residual moisture vapor to equalize harmlessly, preventing blister debonding.





MOVEMENT JOINTS

Movement & Expansion Joints Layout in Screeds

Maximum bay dimensions (4x4m), perimeter soft joints, and structural building joints.

1. Movement Joint Architecture

All tiled assemblies expand and contract with seasonal temperature and humidity fluctuations. Because large format slabs have low joint frequency (fewer flexible grout lines), perimeter and field expansion joints are critical.

Structural Expansion Joints: Any existing building expansion joint or screed contraction cut **MUST** be projected through the adhesive bed and tile finish in the exact same location and width.

2. Maximum Field Bay Sizes

- **Interior Heated Floors:** Divide into maximum **4.0 m x 4.0 m bays (16 m² / 170 sq.ft)**.
- **Interior Unheated Floors:** Divide into maximum **6.0 m x 6.0 m bays (36 m² / 380 sq.ft)**.
- **Exterior Facades & Terraces:** Divide into maximum **3.0 m x 3.0 m bays (9 m² / 100 sq.ft)**.

3. Joint Width & Sealant Specs

Joint Category	Minimum Joint Width	Approved Sealant
Perimeter Movement Joint	Min 6.0 mm (1/4")	Neutral Silicone / Polyurethane
Field Expansion Joint	Min 6.0 mm to 10.0 mm	Pre-formed Movement Joint Profile / PU
Structural Building Joint	Match Building Joint (Min 15mm)	Structural Joint Profile with EPDM core

NEVER BRIDGE EXPANSION JOINTS

Never lay a slab across a substrate expansion joint. The joint must continue through the tile finish. Slabs bridging expansion joints will shear and crack within 6 months.



WATERPROOFING

Waterproofing Systems for Wet Areas & Tanking

Liquid membranes (ANSI A118.10), elastomeric corner tape, and 24-hour flood tests.

1. The Wet Room Waterproofing Imperative

While sintered porcelain slabs have near-zero water absorption (< 0.06%), grout joints and perimeter corners are micro-pathways for moisture infiltration. If water bypasses the tile layer without a continuous waterproofing barrier, it saturates drywall and timber joists.

All wet areas—including walk-in curbless showers, steam rooms, and bathtub surrounds—require a certified **continuous liquid-applied waterproofing membrane (ANSI A118.10 / EN 14891 Class DM)**.

2. Elastomeric Corner Sealing Bands

Every floor-to-wall change of plane, inside corner, and pipe penetration **MUST** be reinforced using **elastomeric waterproof sealing tape with fleece borders** embedded in the first wet membrane coat.

3. Waterproofing Application Sequence

Stage	Application Protocol
Primer Layer	Acrylic bonding primer applied to dust-free substrate
Joint Reinforcement	Embed elastomeric sealing bands at all internal corners
First Membrane Coat	Cross-roll liquid membrane (min 0.8mm wet film thickness)
Second Membrane Coat	Apply perpendicular coat once first coat cures (total dry film ≥ 1.0mm)
Flood Testing	24-hour standing water flood test prior to slab setting

THE 24-HOUR FLOOD TEST

Plug the shower drain and fill the basin with 50mm of water for 24 hours. Verify zero water drop or underside dampness before laying slabs.



SHOWER DESIGN

Shower Inlets & Slope Gradient Requirements

Single-plane slope falls (1.5–2%), linear trench drains, and curbless shower pans.

1. Slope Falls for Large Slabs

Traditional center drains require a multi-directional 4-way compound slope (funnel shape). Large format rigid slabs cannot conform to compound 4-way slopes without extensive envelope cuts that disrupt aesthetics.

Large format shower installations require a **single-plane unidirectional slope** draining toward a wall-to-wall **linear trench drain**.

2. Minimum Slope Gradient (1.5% to 2.0%)

The mortar shower bed must maintain a continuous gradient fall of **1.5% to 2.0% (15mm to 20mm drop per meter)** toward the linear drain inlet, ensuring complete gravitational runoff without standing water puddles.

3. Linear Drain Installation Standards

Drain Parameter	Certified Specification
Drain Style	Wall-adjacent or threshold-adjacent Linear Trench Drain
Minimum Gradient Fall	1.5% (1:66 slope) • Preferred 2.0% (1:50)
Flange Waterproofing	Integrate factory stainless drain flange into tanking membrane
Tile Grate Insert	Tile-in drain channel clad with matching slab off-cut

CURBLESS ZERO-THRESHOLD TRANSITION

Recess the bathroom subfloor by 30mm during structural framing, allowing a flush, barrier-free wheelchair accessible walk-in shower.



PRIMER MATRIX

Primer Selection Matrix — Porous vs Dense Bases

Capillary suction regulation, acrylic bonding primers, and quartz silica grip primers.

1. The Role of Chemical Primers

Primers regulate substrate suction and create a chemical bridging bond between the substrate and the tile adhesive mortar:

- **Porous Screeds:** Water in the adhesive is rapidly sucked into dry concrete, starving the cement of hydration water and causing powdery adhesive failure. Primers seal porous capillaries, keeping water in the mortar.
- **Dense / Non-Absorbent Surfaces:** Existing glazed tiles or steel plates have zero absorption. Specialty primers contain quartz silica aggregate to impart sandpaper-like mechanical grip.

2. Master Primer Selection Table

Substrate Type	Substrate Suction	Mandatory Primer Formulation
Cement Screed / Concrete	High Porosity	Synthetic Acrylic Water-Based Primer (1:1 dilution)
Calcium Sulfate (Anhydrite)	Alkaline Sensitive	Pure Polyurethane / Epoxy Moisture Barrier Primer
Existing Ceramic / Marble Tiles	Zero Porosity (Smooth)	Polymer Primer with Crushed Quartz Silica Aggregate
Cement Backer Board	Moderate Porosity	Water-Resistant Acrylic Primer

PRIMER DRYING WINDOW

Allow primers to dry completely to a clear, tacky-free film (typically 1 to 2 hours) before applying adhesive mortar. Tiling over wet primer causes debonding.



SITE SURVEY GATE

Pre-Installation Survey & Verification Gate

10-point substrate audit checklist prior to mixing adhesive mortar.

Before mixing the first bag of adhesive, the lead installer and general contractor must execute this comprehensive site readiness survey.

☐ Substrate Flatness Checked: Gap ≤ 2.0 mm over 2.0 m	☐ Moisture Reading CM ≤ 2.0% (Unheated) / ≤ 1.8% (Heated)
☐ Surface Completely Decontaminated & HEPA Vacuumed	☐ Approved Primer Fully Dried Across Entire Area
☐ Perimeter & Field Movement Joints Mapped in CAD	☐ Waterproofing Membrane Flood Tested (24 Hours)
☐ Ambient Temperature Between 10°C and 30°C	☐ Carrying Frames & Leveling Clips Staged at Work Area
☐ Tile Boxes Inspected: Single Shade & Caliber Lot	☐ C2TE S1/S2 Adhesive Verified within Shelf Life

Substrate Survey Project: _____	Installer Lead Signature: _____	Date: __ / __ / 2026
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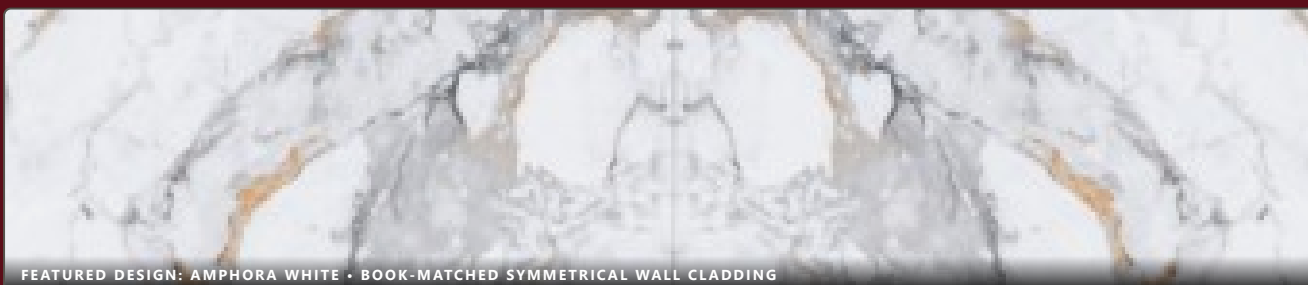
SECTION 4 • SLAB INSTALLATION DIVISION

LAYOUT, DESIGN & VEIN MATCHING

Grid mapping, cutting plans, joint width rules, bookmatching, and pattern harmonization.

KEY TECHNICAL MODULES IN THIS SECTION:

- Laser distance measuring and 3D grid coordinate layout mapping
- Joint width architecture: Minimum 2mm (Floors) / 1.5mm (Walls)
- Slab cutting plan optimization to minimize off-cut waste
- Bookmatching mirror slabs A and B and directional vein continuity



FEATURED DESIGN: AMPHORA WHITE • BOOK-MATCHED SYMMETRICAL WALL CLADDING



GRID MAPPING

Laser Measuring & Grid Mapping Architecture

360° cross-line laser layout, balanced room centerlines, and no-sliver-cut rules.

1. 3D Laser Grid Coordinate Mapping

Large format slabs cannot be laid "by eye." A dimensional error of just 1.0mm across an out-of-square wall will compound over 3.2-meter slabs into unacceptable cut wedges at the room boundary.

Project a 360° self-leveling 3D cross-line green laser across the room. Establish a primary datum centerline bisecting the room and establish square perpendicular lines (3-4-5 triangle principle).

2. Balanced Room Centerline Strategy

Align the primary slab seam along the central architectural axis of the room (e.g., centered on entrance double doors, fireplace hearth, or main window bay). This ensures cut border slabs on opposite walls have identical, balanced widths.

3. The "Small Sliver Cut" Prohibition

NEVER LEAVE NARROW SLIVER CUTS (< 200MM)

Adjust the grid layout so that boundary perimeter cuts along walls are at least **one-third of a slab width (minimum 250 mm to 400 mm)**. Narrow sliver cuts under 150mm look amateurish and are extremely difficult to handle and level without breakage.

Room Feature	Grid Alignment Rule
Main Entrance Portal	Center primary joint or center full slab
Opposite Boundary Walls	Equal balanced cut widths (> 250mm)
Focal Point (Fireplace/TV)	Center bookmatched joint symmetry



CUTTING PLAN

Developing the Slab Cutting Plan & Waste Minimization

CAD nesting plans, off-cut repurposing for sills, and waste percentage estimates.

1. The Slab Cutting Plan

Before cutting raw slabs, draft a detailed cutting plan assigning specific slab serial numbers to exact room locations. Group adjacent wall panels and floor sections onto shared slabs to maintain pattern consistency.

Because full slabs measure 1200x2400mm or 1200x2800mm, strategic nesting minimizes off-cut waste below **8% to 12%**.

2. Off-Cut Repurposing Strategy

Plan in advance to repurpose large remnant off-cuts into door thresholds, window sills, shower niches, or matching perimeter skirting baseboards.

3. Cutting Nesting Parameters

Cut Factor	Allowance Required
Blade / Wheel Kerf Spacing	3.0 mm per cut pass
Edge Squaring Trim	Min 15 mm perimeter cleanup
Waste Factor Estimate (Straight)	8% – 10% over net room area
Waste Factor Estimate (Diagonal)	12% – 15% over net room area

LABEL EVERY CUT PIECE

Label the reverse face of every cut piece with blue chalk indicating its grid row and column coordinates (e.g., "ROW 2, PANEL C - TOP") matching the CAD shop plan.



DRY LAYOUT

Dry Laying Slabs on Site for Pattern Harmonization

Pattern repeat avoidance, dry joint spacing, and client aesthetic pre-approvals.

1. The Site Dry-Layout Protocol

Large format slabs must ALWAYS be dry-laid on the jobsite floor before mixing adhesive mortar. Dry-laying allows the installer, general contractor, and client to view the complete composition under actual room lighting.

Inspect for veining transitions, color shade harmony, pattern repeats, and joint alignment. Swap adjacent slabs until visual harmony is achieved.

2. Floor Protection During Dry Laying

Lay thin 2mm foam or clean corrugated cardboard strips beneath slabs during dry-fitting to prevent grit on the bare concrete screed from scratching the slab backs or edges.

3. Dry-Layout Verification Checklist



Vein Direction Harmonized Across Floor



No Identical Tile Prints Placed Adjacent



Joint Spacers Inserted Dry (2.0mm)



Boundary Wall Cut Widths Verified



Numbered Labels Applied to All Pieces



Client Written Sign-Off Obtained

CLIENT PRE-APPROVAL MILESTONE

Take photographs of the approved dry layout. Obtaining written client sign-off prior to adhesive bonding eliminates aesthetic disputes.



JOINT STANDARDS

Joint Width Architecture — Grout Joint Rules

Absolute prohibition of butt-jointing, 2.0mm floor joint rules, and radiant heat buffers.

1. The Absolute "Zero-Grout" Prohibition

NEVER BUTT-JOINT SLABS (ZERO GROUT)

BUTT-JOINTING LARGE FORMAT SLABS WITH ZERO GROUT IS STRICTLY PROHIBITED BY ALL INTERNATIONAL STANDARDS (ISO 13006, ANSI A108, EN 14411). Slabs touching edge-to-edge cannot accommodate natural building deflection or thermal expansion. When slabs expand, touching edges exert immense point pressure, resulting in shattered edges (spalling) and tile tenting.

2. Mandatory Minimum Joint Widths

Certified minimum grout joint widths for rectified sintered porcelain slabs:

- **Interior Residential & Commercial Floors:** Minimum **2.0 mm (3/32")** joint width.
- **Interior Wall Cladding:** Minimum **1.5 mm (1/16")** joint width.
- **Floors with Underfloor Radiant Heating:** Minimum **3.0 mm (1/8")** joint width.
- **Exterior Ventilated Facades & Terraces:** Minimum **5.0 mm (3/16")** joint width.

3. Joint Width Matrix

Application Setting	Minimum Grout Joint Width
Interior Walls (Rectified)	1.5 mm
Interior Floors (Rectified)	2.0 mm (Mandatory minimum)
Heated Radiant Screeds	3.0 mm
Exterior Wet Terraces	5.0 mm
Large Commercial Halls (> 100m²)	3.0 mm – 4.0 mm



SEAM ARCHITECTURE

Seam Positioning Strategy & Visual Symmetry

Centerline alignment on plumbing fixtures, floor-to-wall joint continuation, and thresholds.

1. Symmetry in Large Format Tiling

Because each slab is large, poor seam placement draws immediate negative attention. Seams must be integrated into the architecture rather than ending arbitrarily.

In bathrooms, center vertical wall joints directly on the mixer faucet, vanity basin centerline, or shower niche vertical edge to create visual balance.

2. Aligning Floor and Wall Joints

Whenever floor slabs and wall slabs share common dimensions (e.g., 1200x2400mm on both surfaces), align floor joint lines continuously up the wall. Coincident floor-to-wall joints create high-end architectural unity.

3. Doorway Threshold Transition Seams

Never run a continuous slab through a doorway into an adjacent room. Always place a joint centered directly beneath the closed interior door leaf (typically centered under the 40mm door slab).

THE DOOR LEAF SOFT JOINT

The threshold joint under a door leaf must be a flexible movement joint filled with color-matched silicone to isolate structural movement between adjacent rooms.



PATTERN CONTINUITY

Pattern & Vein Direction Continuity Across Slabs

Factory reverse directional arrows, graphic face randomization, and vein collision avoidance.

1. Directional Printing & Factory Arrows

Every porcelain slab features directional arrows stamped on its reverse ceramic body during manufacturing. In marble veined and linear stone patterns, these arrows indicate the flow direction of the digital inkjet print.

Unless intentionally bookmatching or rotating for a random natural stone look, all slabs across a single floor plane should be laid with their **reverse directional arrows pointing in the same direction**.

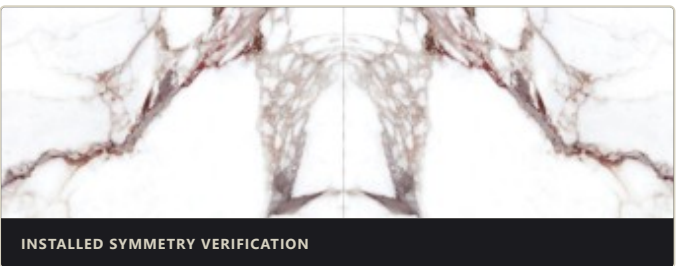
2. Preventing "Head-to-Tail" Clashes

Laying adjacent veined slabs with reversed arrows creates jarring visual collisions where branching veins terminate abruptly into dead ends.

3. Visual Repeat Management

High-end Sheen collections feature between **4 and 8 distinct graphical faces** per color. When opening boxes, sort slabs by graphic face number. Never install two identical graphic faces side-by-side or end-to-end.

Pattern Family	Recommended Directional Strategy
Directional Veins (Calacatta)	Align arrows or execute matched bookmatch
Industrial Concrete / Basalt	Rotate 180° alternating for uniform texture
Linear Wood / Travertine	Strictly parallel grain arrow alignment





BOOKMATCHING

Bookmatching Architecture — Mirror Slabs A and B

Mirror slab A/B pairing, quad-matching cross axes, and center-outward setting sequence.

1. Bookmatch Geometry Principles

Bookmatching pairs two mirror-image slabs (Slab A and Slab B) joined along a central seam, creating a symmetrical butterfly or diamond pattern reminiscent of bookmatched marble veneers.

Bookmatching requires flawless joint alignment. The central joint must be exactly **1.5 mm (on walls) or 2.0 mm (on floors)**. A wider joint pulls the mirror veins apart, destroying optical continuity.

2. Quad-Matching (4-Slab Bookmatch)

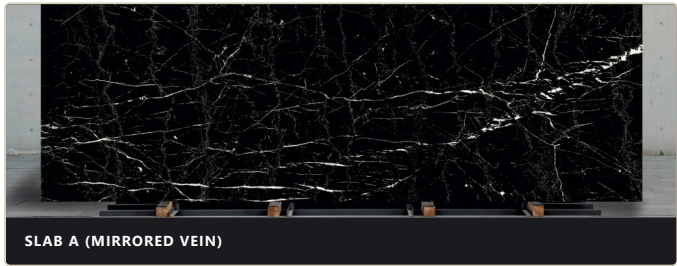
In monumental spaces, four slabs (A, B, C, D) are joined along two intersecting cross-axes, forming a symmetrical central medallion diamond. This requires setting the central intersection point with millimeter precision.

3. Bookmatch Installation Rules

CENTER OUTWARD INSTALLATION SEQUENCE

When installing bookmatched panels, always set the central mirror pair (A & B) FIRST. Level and align the central seam perfectly before setting outer perimeter border slabs.

Bookmatch Step	Quality Check
Slab Selection	Verify matching consecutive serial numbers
Dry Laying	Align mirror veins under bright overhead light
Joint Width	Calibrate central joint with 1.5mm / 2.0mm spacers
Lippage	Zero tolerance (< 0.2mm) across central mirror seam





TRANSITION DETAILS

Transition Detailing Between Slabs & Other Floors

Schluter metal profile edging, flush hardwood junctions, and differential expansion buffers.

1. Transition Profiles to Dissimilar Floors

Where large format porcelain slabs meet other flooring materials—such as hardwood, carpet, luxury vinyl, or exposed concrete—a dedicated architectural transition profile must be installed.

Different materials expand at vastly different rates (e.g., hardwood swells with humidity; sintered porcelain expands minimally). Direct contact without a flexible transition profile causes edge chipping and tile tenting.

2. Profile Architecture

Use high-grade anodized aluminum, solid brass, or stainless steel profiles (e.g., Schluter Schiene, Schluter Reno). The anchoring leg of the profile embeds securely into the mortar bed beneath the slab edge.

3. Transition Types & Tolerances

Floor Junction	Approved Transition System
Slab to Hardwood (Flush)	Stainless L-Profile with 3mm silicone buffer
Slab to Carpet	Reno-TK Sloped Transition Profile
Slab to Lower Floor (Step-Down)	Reno-U Sloped Reducer Profile
Slab to Glass Partition	Recessed U-Channel with Neoprene Gasket

THE 3MM BUFFER JOINT

Maintain a 3mm flexible joint between the metal profile and the wood floor filled with flexible polyurethane caulk to accommodate hardwood expansion.



OFF-CUT ECONOMY

Off-Cut Inventory & Matching Skirting Fabrication

Bullnosed baseboard skirtings, window sill fabrication, and perimeter expansion gaps.

1. Maximizing Material Economy

Large format slabs generate valuable off-cut strips (e.g., 200mm to 400mm width by 2400mm length). Discarding these remnants as waste increases project costs.

Fabricate continuous matching baseboard skirtings, stair risers, shower threshold curbs, and window sills directly from project off-cuts using waterjet or rail saw cutting.

2. Factory Bullnose Edge Dressing

When cutting skirting strips (typically 80mm to 100mm height), the cut top edge must be dressed with a rounded or micro-beveled profile using a diamond hand pad (100 to 400 grit) so the top rim is smooth and elegant.

3. Off-Cut Repurposing Inventory Table

Remnant Off-Cut Size	Recommended Architectural Use
80 mm – 100 mm Strips	Room Perimeter Skirting Baseboards (Bullnosed)
150 mm – 200 mm Strips	Staircase Risers & Shower Curb Caps
200 mm – 350 mm Strips	Deep Window Sills & Shower Recessed Niche Shelves
Large Triangular Remnants	Threshold Transition Saddles

SKIRTING EXPANSION BUFFER

Leave a 2mm gap between the floor slab and bottom of the skirting tile, filled with flexible silicone, allowing the floor to move freely beneath the wall skirting.



DESIGN APPROVAL

Pre-Layout Client Approval Protocol & Sign-Off

Formal joint installer-client dry layout verification and written authorization gate.

Before mixing adhesive and setting slabs permanently, the installation team must document and execute this formal Pre-Layout Client Sign-Off protocol with the project manager or interior designer.

☐ All Slabs Dry-Laid on Jobsite Floor	☐ Vein Orientation & Bookmatching Approved
☐ Joint Width Spacers Verified (2.0mm)	☐ Perimeter Wall Cut Widths Balanced
☐ Movement Joint Locations Mapped	☐ Transition Profiles to Other Floors Approved
☐ Grout Color Specimen Reviewed & Approved	☐ Photographic Digital Record Captured

FORMAL PRE-SETTING DESIGN APPROVAL

"The client / architect hereby approves the physical dry layout, vein matching composition, and joint spacing of the large format sintered slabs. The installation team is authorized to proceed with permanent mortar setting."

Client / Designer Signature: _____

Lead Installer Signature: _____

Date: __ / __ / 2026



SECTION 5 • SLAB INSTALLATION DIVISION

SLAB CUTTING, DRILLING & EDGE PROFILING

Rail scoring systems, progressive pliers, diamond wet rail saws, core drilling, and edge finishing.

KEY TECHNICAL MODULES IN THIS SECTION:

- Dedicated large format slab scoring guide rails and carriages
- Tungsten carbide / diamond scoring wheels and progressive snapping
- Diamond wet core drilling for plumbing inlets (45° angle technique)
- The zero 90° notch prohibition & mandatory corner relief holes



FEATURED DESIGN: DARK GREY COLOR-BODY • HOMOGENEOUS CROSS-SECTION 45° MITER CUTTING



CUTTING TOOLING

Specialized Slab Cutting Tools — Guide Rails & Carriages

Modular suction guide rails, sliding carriages, and aluminum slatted workbenches.

1. Dedicated Slab Cutting Tooling Suite

Standard manual ceramic tile cutters (guillotine style) cannot cut 3.2-meter slabs. Sintered slabs require a dedicated **modular aluminum guide rail cutting system** (e.g., Raimondi Free-Cut, Montolit Flash Line, Sigma Kera-Cut).

Aluminum rails (typically 1.6m modular sections connected with precision steel alignment pins) attach directly to the slab face using built-in high-grip vacuum suction cups, ensuring zero guide flexure during heavy scoring.

2. Scoring Carriage Mechanics

A sliding carriage with ball bearings rides along the rail track, holding a tungsten carbide or diamond-coated scoring wheel (Ø 12mm to 16mm) under constant downward pressure.

3. Recommended Tooling Inventory

Tool Category	Recommended System
Modular Guide Rails	Raimondi Free-Cut / Montolit Flash Line (3.3m total)
Scoring Wheels	Ø 12mm Titanium Carbide / Diamond Coated
Separation Pliers	Progressive mechanical knob separation pliers
Wet Circular Saw	Rail-guided circular saw (e.g., Festool TS 55 / Raimondi Power-Free)
Wet Angle Grinder	Variable-speed wet grinder (2,000 – 4,000 RPM)

RIGID SUPPORT TABLE MANDATE

Always cut slabs on an industrial aluminum slatted workbench (e.g., Montolit Table). Cutting on wobbly saw horses or uneven floor boards leads to uncontrolled snapping.



SCORING MECHANICS

Manual Scoring Technique with Diamond Wheels

Single continuous score rule, pressure modulation, and thickness capabilities.

1. The Single Continuous Score Rule

Manual scoring relies on creating a continuous micro-fissure across the vitrified top glaze. Sintered porcelain is under high molecular compaction; a clean score line guides subsequent fracture separation.

The Golden Rule: The scoring pass **MUST** be executed in a **single, continuous, uniform pass from one end of the slab to the other**. Never stop and start in the middle of a cut, and **NEVER** score over an existing line twice. Multiple score lines create diverging fracture paths that ruin the cut.

2. Pressure Modulation

Apply firm, steady downward pressure (approximately 15 to 20 kg force). Push the carriage smoothly at a constant pace (approx. 0.5 m/sec). The wheel should emit a crisp, continuous "zipping" sound.

3. Scoring Parameters by Thickness

Slab Thickness	Scoring Method	Separation Feasibility
6 mm Slim	Manual Guide Rail Scoring	Excellent (Snaps effortlessly with pliers)
9 mm Standard	Manual Guide Rail Scoring	Good (Requires progressive knob pliers)
12 mm Heavy	Manual Scoring or Wet Saw	Moderate (Wet saw recommended for narrow strips)
15 mm Heavy	Wet Diamond Saw Mandatory	DO NOT MANUAL SCORE (Wet saw required)

EDGE INCISION WARNING

Ensure the scoring wheel engages the very first millimeter at the entry edge and runs cleanly off the exit edge. Incomplete edge scoring causes jagged corner blowouts.



SNAPPING EXECUTION

Progressive Separation Pliers & Clean Slab Snapping

Progressive knob-action pliers, two-end crack initiation, and minimum 100mm width limits.

1. Mechanics of Controlled Snapping

Once scored, the slab must be separated along the score fissure. Standard squeeze pliers apply violent point shock that can cause cracks to diverge into the main body.

Use **progressive knob-action separation pliers** (e.g., **Montolit 56R, Raimondi Pliers**). These pliers apply progressive, calibrated mechanical pressure from beneath the score line, slowly opening the fissure.

2. Two-End Progressive Snapping Method

- Position the pliers at one end of the scored line; turn the pressure knob until a 20mm crack initiates.
- Move to the opposite far end of the score line; engage pliers and turn knob until crack initiates.
- Gently lift the cut off-cut; the crack will zip cleanly through the entire 3.2-meter length.

3. Off-Cut Width Snapping Limits

MINIMUM SNAPPING STRIP WIDTH: 100MM

Do not attempt to manually score and snap strips narrower than **100 mm (4 inches)** on 9mm/12mm slabs (or 60mm on 6mm slabs). Narrow strips lack the structural leverage required to snap cleanly. Narrow cuts must be made with a wet diamond rail saw.

Thickness	Min Manual Snapping Strip
6 mm Slim	60 mm (2.5")
9 mm	100 mm (4.0")
12 mm	150 mm (6.0")



WET RAIL SAWS

Diamond Wet Rail Saw Cutting & Plunge Operations

Ultra-thin 1.2mm diamond blades, variable speed saws, and 12mm/15mm cut protocols.

1. When Wet Rail Sawing is Mandatory

While scoring is fast for straight cuts, wet diamond rail saws are mandatory for:

- All cuts on **12 mm and 15 mm** thick slabs.
- Narrow strips under 100mm width.
- L-shaped inside corner cutout plunge cuts.
- 45° miter cuts for external jolly corners.

2. Specialized Thin-Rim Diamond Blades

Use specialized ultra-thin continuous-rim diamond blades (e.g., Montolit Squadro, Raimondi TVT) with blade kerf of **1.2 mm to 1.6 mm**. Thick masonry blades generate heavy vibration that chips hard porcelain.

3. Wet Saw Cutting Protocols

Parameter	Specification
Blade Diameter	115 mm – 125 mm (4.5" – 5.0")
Blade Kerf Thickness	1.2 mm – 1.6 mm Ultra-Thin
Spindle Speed	8,000 – 11,000 RPM (Variable speed)
Feed Rate	0.8 – 1.2 m/min (Smooth continuous feed)
Water Feed	Continuous flood to blade guard inlet

PLUNGE CUT TECHNIQUE

When plunge-cutting cutouts with a rail saw, always core drill corner relief holes first. Stop the saw blade 10mm before touching the drill hole.



CORE DRILLING

Diamond Core Bits — Wet Core Drilling Protocols

Vacuum-brazed diamond bits, rotary-only drill settings, and internal water swivels.

1. Sintered Porcelain Hardness Challenge

Sintered porcelain ranks **Mohs 7 to 8**—significantly harder than standard granite or limestone. Attempting to drill sintered porcelain using carbide masonry bits or hammer drills will shatter the slab instantly.

Drilling requires **electroplated or vacuum-brazed diamond core bits** operated in rotary mode only (ZERO hammer action) with continuous water cooling.

2. Center-Water-Feed Drill Rigs

For high precision, use a variable-speed drill attached to a vacuum suction drill guide stand with internal water reservoir or pressurized water tank.

3. Core Bit Speed & Water Matrix

Bit Diameter	Optimal Rotary Speed	Cooling System
Ø 6 mm – 10 mm (Wall Anchors)	2,000 – 3,000 RPM	Submerged water sponge
Ø 20 mm – 25 mm (Corner Relief)	1,500 – 2,200 RPM	Pressurized water tank feed
Ø 35 mm (Faucet Holes)	1,200 – 1,800 RPM	Internal water swivel feed
Ø 50 mm – 100 mm (Waste Pipes)	600 – 1,000 RPM	Continuous water flood

HAMMER MODE WARNING

Verify drill selector is set to **ROTATION ONLY**. A single impact stroke from hammer mode will crack a 3.2m porcelain slab completely in half.



DRILL TECHNIQUE

Drilling Circular Openings — 45° Angle Approach

Freehand 45° start crescent, orbital oscillation, and underside blowout support.

1. The Freehand 45° Approach Method

When drilling circular holes on site without a suction guide stand, the smooth vitrified glaze causes core bits to "skate" across the surface, scratching the finish.

Master installers employ the **45° angle approach method**:

- Start the core bit at full drill speed (approx. 2,000 RPM) holding the drill at a **45° angle** to the slab surface.
- Gently touch the edge of the bit to the stone, grinding a shallow crescent groove (1mm deep).
- Using the crescent groove as an anchor, slowly pivot the drill upright to perpendicular **90°**.
- Maintain gentle, circular oscillating motion ("wobble" the drill slightly 2°–3°) to clear slurry.

2. Backing Support Against Blowout

As the core bit cuts through the final 1mm on the reverse side, aggressive pressure will blow out a ragged cone chip.

Always place a scrap piece of rigid cement board or dense wood tightly beneath the drilling point to support the reverse face until breakthrough.

WATER RETENTION RING

Stick a donut ring of plumber's putty or a commercial suction cup water reservoir around the hole location to hold a standing pool of cooling water.



ELECTRICAL CUTOUTS

Rectangular Electrical Box Cutout Techniques

4-corner relief drill holes, plunge cut sequencing, and minimum 80mm edge buffers.

1. Electrical Box Cutout Geometry

Kitchen splashbacks and feature walls require multiple rectangular openings for electrical power receptacles and light switches (standard 70x110mm double gang boxes).

Cutting these small rectangular openings requires meticulous technique to avoid breaking thin wall slabs.

2. The 4-Corner Relief Hole Protocol

- Mark the exact outlet perimeter in pencil.
- Core drill four **Ø 10mm to 12mm holes** at all four inside corners **FIRST**.
- Using a high-speed wet angle grinder with an ultra-thin 115mm diamond blade, plunge-cut straight lines connecting the outer perimeters of the drilled holes.
- STOP blade before touching the hole centers; never overcut corners.

3. Electrical Cutout Clearances

Dimension	Minimum Requirement
Corner Relief Drill	Min Ø 10 mm Core Bit
Distance to Slab Edge	Min 80 mm from any outer edge
Distance Between Adjacent Boxes	Min 60 mm solid stone web
Overcut Allowance	ZERO ALLOWABLE OVERCUT

OSCILLATING MULTI-TOOL ALTERNATIVE

For delicate electrical box cuts in 6mm slabs, use an oscillating multi-tool fitted with a diamond-grit blade under water mist; causes far less vibration than an angle grinder.



PLUMBING CORES

Plumbing & Valve Penetration Clearances

Thermal pipe expansion gaps, escutcheon plate overlaps, and 80mm edge buffers.

1. Plumbing Rough-In Penetrations

Shower walls require precision penetrations for shower mixing valves, diverters, body spray jets, and shower arm stub-outs.

Always core drill plumbing holes **6 mm to 10 mm larger than the rough pipe diameter** to allow thermal expansion clearance. Copper and PEX hot water pipes expand dynamically; if a hot pipe presses directly against the porcelain hole edge, the slab will crack.

2. Minimum Edge Clearances

Maintain a minimum distance of **80 mm (3.2 inches)** between any core drilled hole edge and the outer perimeter of the slab.

3. Plumbing Penetration Clearances

Plumbing Fixture	Pipe Diameter	Core Bit Hole Size
1/2" Shower Arm Stub-Out	21 mm (Copper/PEX)	Ø 28 mm – 32 mm
Concealed Shower Valve Body	80 mm – 110 mm Body	Ø 95 mm – 120 mm Core
3/4" Hot Supply Pipe	27 mm	Ø 35 mm Core
Toilet Waste Flange	110 mm (PVC)	Ø 120 mm – 130 mm Core

ESCUTCHEON FLANGE OVERLAP

Verify that plumbing fixture escutcheon trim plates (chrome cover rings) have sufficient diameter to conceal the oversized expansion hole.



FRACTURE MECHANICS

The Zero 90° Notch Prohibition — Stress Physics

Notch sensitivity, 900% stress concentration factors, and overcut crack failure paths.

In large format sintered porcelain, sharp 90° interior notches are mechanically fatal. Understanding fracture mechanics explains why inside corners must never be cut square.

1. Notch Sensitivity of Sintered Porcelain

Sintered porcelain is an extremely dense, brittle material with high compressive strength but zero plastic deformation capability. When stress loads travel through the slab, they cannot deform the material plastically.

At a sharp 90° square inside corner, mechanical shear stresses converge onto an infinitely narrow apex. The stress concentration factor at a 90° notch exceeds **900%** of nominal load.

2. Thermal & Structural Failure Mode

As the building experiences micro-settlement or temperature shifts, the immense stress concentrated at the 90° vertex releases catastrophically, creating a diagonal crack propagating across the entire slab.

SAW OVERCUT PROHIBITION

A diamond blade overcutting past the corner point acts as an intentional fracture score. Slabs with overcuts will break during transport or setting.



RELIEF DRILLING

Mandatory Relief Holes at Inside Corners

Mandatory Ø 20mm drill-before-cutting protocol and radius gauge inspection standards.

Every internal corner on a sintered porcelain slab (L-shaped shower wall cuts, window return cutouts, column wraps) **MUST** be executed using a **mandatory relief hole drilled prior to linear cuts**.

1. Step-by-Step Corner Relief Execution

- **Step 1:** Mark the cutout corner coordinate in pencil.
- **Step 2:** Core drill a clean, smooth hole with a minimum **Ø 20 mm (or Ø 25mm)** diamond core bit at the corner vertex.
- **Step 3:** Using a rail saw or manual score cutter, make linear cuts tangent into the outer edge of the drilled hole.
- **Step 4:** NEVER allow straight cuts to cross or intersect beyond the drilled hole.
- **Step 5:** Smooth any micro-burrs inside the curved radius using a 100-grit diamond cone pad.

2. Minimum Corner Radius Standards

Cutout Application	Minimum Inside Radius
Column Wraps & Wall Returns	Min R ≥ 10 mm (Ø 20mm drill)
Window Returns / Door Openings	Min R ≥ 10 mm
Shower Wall Niches	Min R ≥ 10 mm
Electrical Receptacle Boxes	Min R ≥ 5 mm (Ø 10mm drill)

CURVED RADIUS VERIFICATION

Inspect every inside corner with a radius gauge tool. Smooth curved corners distribute stresses evenly, preventing fracture.



EDGE DRESSING

Edge Smoothing & Micro-Arris Calibration

Diamond hand sanding pads (60–400 grit), 1.0mm micro-bevel chamfers, and safety arris.

1. Edge Dressing After Snapping

Freshly scored or wet-sawed slab edges leave razor-sharp knife edges (arises) and microscopic glass burrs that are vulnerable to handling chipping and pose severe laceration hazards to installers.

Immediately after snapping or sawing, dress the top and bottom edge boundaries with a **semi-flexible diamond hand sanding pad (100 to 200 grit)** held at a 45° angle, imparting a uniform **1.0 mm micro-bevel arris**.

2. Diamond Hand Pad Grit Progression

Grit Step	Tool Function	Resulting Edge
60 Grit (Diamond)	Remove saw teeth marks & burrs	Fast stock removal
120 Grit (Diamond)	Form 1.0mm micro-bevel arris	Clean, chip-free chamfer
200 Grit (Diamond)	Smooth edge roughness	Silky smooth to fingertips
400 Grit (Resin)	Hone arris to match satin sheen	Factory-matched finish

GROUT BONDING PRECAUTION

Do not polish the vertical cut face of the joint. Leave the vertical cut face rough to maximize mechanical bonding adhesion of the cementitious grout mortar.



CUTOUT RIGGING

Cutout Reinforcement on Thin Slabs During Movement

Temporary vacuum clamp rails, torsional flexure prevention, and on-site cutout timing.

1. Thin Slab Fragility at Cutouts

When a large window or plumbing cutout is machined into a 6mm or 9mm slab, the remaining narrow side rails have significantly reduced section modulus. Handling the slab without reinforcement will snap the narrow rails under torsional flexure.

2. Temporary Clamp Bar Reinforcement

Attach two rigid aluminum carrying rails spanning across the cutout opening, secured with vacuum suction cups on both sides of the hole. These support rails must remain clamped in position until the slab is set flat into the mortar bed.

3. Cutout Reinforcement Rules Summary



Clamp Aluminum Rail Before Moving Slab



Position Suction Cups 50mm from Cutout Edge



Lift Slab Strictly on Vertical Plane



Four Installers Support Outer Corners



Lower Slab into Wet Mortar Bed Smoothly



Remove Clamp Rails Only After Bedding Flat

JOBSITE CUTOUT EXECUTION

Whenever possible, execute large rectangular cutouts on site directly adjacent to the installation wall rather than transporting pre-cut slabs across town.



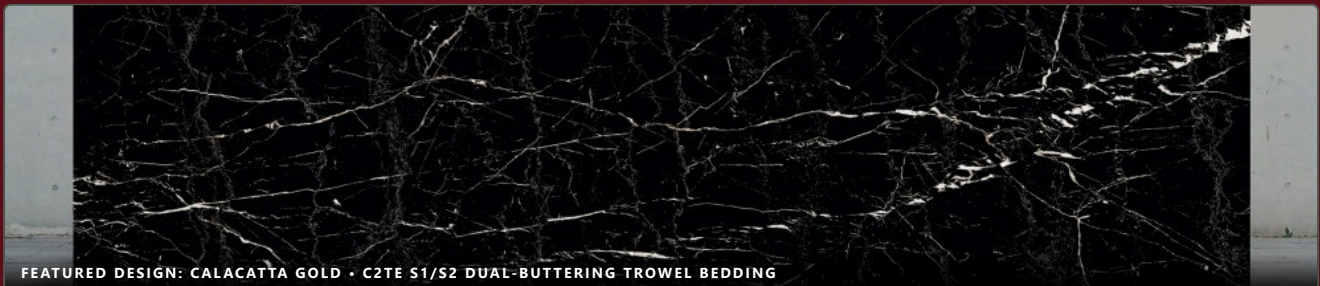
SECTION 6 • SLAB INSTALLATION DIVISION

ADHESIVE SELECTION & INSTALLATION SYSTEM

C2TE S1/S2 deformable adhesives, 100% back-buttering, slanted trowels, and leveling clips.

KEY TECHNICAL MODULES IN THIS SECTION:

- High-performance polymer-modified cementitious adhesives (ISO 12004)
- Slanted notch trowels (12mm) and parallel-ridge combing rules
- The mandatory 100% back-buttering protocol (95%+ interior coverage)
- Mechanical tile leveling clip mechanisms and lippage tolerances (< 0.5mm)



FEATURED DESIGN: CALACATTA GOLD • C2TE S1/S2 DUAL-BUTTERING TROWEL BEDDING



ADHESIVE SCIENCE

High-Performance Adhesives — ISO 12004 C2TE S1/S2

Polymer modification, vitrified bonding mechanics, and S1/S2 deformability standards.

1. The Sintered Porcelain Bonding Challenge

Traditional ceramic tiles have porous backs (3% to 10% water absorption) that mechanically absorb liquid cement slurry. In contrast, sintered porcelain slabs are completely vitrified with near-zero absorption ($\leq 0.06\%$).

Standard basic tile adhesives (C1 class) CANNOT bond to sintered porcelain. Sintered slabs require **high-performance, polymer-modified cementitious adhesives certified under ISO 12004 / EN 12004 as C2TE S1 or C2TE S2.**

2. Decoding ISO 12004 Classifications

Code	Designation	Technical Meaning
C2	Improved Cementitious	Tensile bond strength $\geq 1.0 \text{ N/mm}^2$ after water/heat aging
T	Slip Resistant	Thixotropic vertical anti-sag ($\leq 0.5 \text{ mm}$ slip on walls)
E	Extended Open Time	Open working time ≥ 30 minutes before skinning
S1	Deformable Adhesive	Transverse flexibility between 2.5 mm and 5.0 mm
S2	Highly Deformable	High transverse flexibility $\geq 5.0 \text{ mm}$ deflection

DEFORMABILITY STANDARD (S1 / S2)

S1 and S2 adhesives contain high concentrations of flexible redispersible polymer resins that absorb shear movement between expanding slabs and curing concrete screeds.



SELECTION MATRIX

Adhesive Selection Matrix by Substrate & Area

C2TE S1 vs S2 specifications across floors, walls, heated screeds, and exterior facades.

The matrix below specifies certified adhesive classifications for Sheen Sintered Slabs based on installation environment, substrate type, and slab dimensions.

Application Setting	Substrate Type	Slab Thickness	Mandatory Adhesive Class	Approved Commercial Brand Examples
Interior Residential Floors	Cured Concrete Screed	9mm / 12mm / 15mm	C2TE S1	Mapei Ultralite S1 • Laticrete 254 Platinum • Ardex X77
Underfloor Radiant Heated Floors	Heated Screed / Decoupling	9mm / 12mm / 15mm	C2TE S1 / S2	Mapei Keraflex Maxi S1 • Bostik Ardaflex S2 • Kerakoll Biogel No Limits
Interior Wall Cladding	Cement Backer Board	6mm Slim / 9mm	C2TE S1 (Thixotropic)	Mapei Ultralite S1 Quick • Laticrete 4-XLT • SikaCeram 255
Commercial High-Footfall Concourses	Reinforced Heavy Screed	12mm / 15mm	C2TE S2	Mapei Ultralite S2 • Ardex X78 S2 • Laticrete MULTI-MAX
Exterior Ventilated Facades	Cement Board / Masonry	9mm / 12mm (Meshed)	C2TE S2 High Flex	Mapei Keralastic T (PU/Epoxy) • SikaCeram 290 StarLight S2
Tile-Over-Tile Overlay	Existing Degreased Ceramic	6mm Slim	C2TE S1 + Primer	Mapei Eco Prim Grip + Keraflex Maxi S1



MIXING SCIENCE

Adhesive Mixing Parameters — Slump & Slaking

Slow-speed paddle mixing (350 RPM), 5-minute slaking window, and water-ratio discipline.

1. Mechanical Mixing Protocol

High-polymer C2TE S1/S2 adhesives cannot be mixed by hand with a trowel. Hand mixing fails to homogenize polymers and leaves un-hydrated powder lumps.

Always mix using a **slow-speed electric paddle mixer (350 to 500 RPM)** fitted with a helical spiral paddle. High-speed drill mixing (> 1,000 RPM) whips excessive air bubbles into the mortar, reducing compressive density.

2. The Mandatory "Slaking" Period

After initial mixing for 3 minutes to a smooth, creamy lump-free consistency, **ALLOW THE MORTAR TO SLAKE (REST) FOR 5 MINUTES.**

Slaking allows dry synthetic polymer resins to fully dissolve and hydrate chemically. After 5 minutes, remix for 60 seconds without adding additional water.

3. Mixing Ratios & Water Balance

NEVER OVER-WATER ADHESIVE

Adding excess water to make mortar "runnier" destroys polymer tensile bond strength, causes severe shrinkage slumping beneath heavy slabs, and induces lippage. Follow the manufacturer's exact water-to-powder ratio (typically 5.5 to 6.5 Litres per 20kg bag).

Mixing Stage	Specification Standard
Water Ratio	Exact measure with graduated cylinder
Mix Speed	350 – 500 RPM (Low speed paddle)
Initial Mix Time	3.0 Minutes continuous
Slaking Rest Time	5.0 Minutes mandatory rest
Remix Time	1.0 Minute remix
Pot Life in Bucket	Approximately 4 to 6 hours at 20°C



TROWEL GEOMETRY

Trowel Selection — Slanted 12mm Euro Notch Trowels

Slanted-notch vs square-notch ridge collapse physics and dual trowel pairing.

1. Why Standard Square Trowels Fail

Standard square-notched trowels (6x6mm or 10x10mm) produce square vertical mortar ridges. When a large slab is pressed down, square ridges fold over onto themselves, trapping deep air channels between adjacent ridges.

Large format slabs require **slanted-notch (Euro-notch) trowels** (e.g., **Raimondi Volpe**, **Rubi Slanted Trowel**) or round-notched trowels (12mm to 15mm). Slanted ridges collapse progressively in one direction, expelling all trapped air outward.

2. Dual Trowel Pairing System

Application Surface	Mandatory Trowel Type	Ridge Height
Substrate Floor / Wall	12mm x 12mm Slanted Notch (Euro Notch)	~ 10 mm standing ridge
Slab Back (Butter Coat)	4mm x 4mm Square Notch or Flat Margin Float	~ 2 mm solid film

TROWEL TOOTH WEAR CHECK

Trowel teeth wear down rapidly against abrasive concrete screeds. Check notch depth daily; replace trowels when teeth wear down by more than 2mm.



BACK-BUTTERING

The Golden Rule — 100% Back-Buttering Protocol

Technical diagram: Parallel ridge combing vs prohibited swirl traps, and dual spreading.

Back-buttering (double spreading) is mandatory on all large format slabs without exception. Adhesive must be applied to BOTH the substrate and the reverse face of the slab.

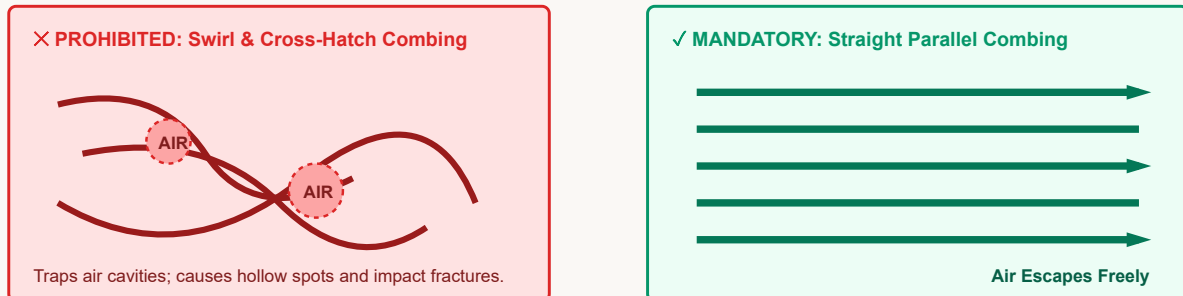
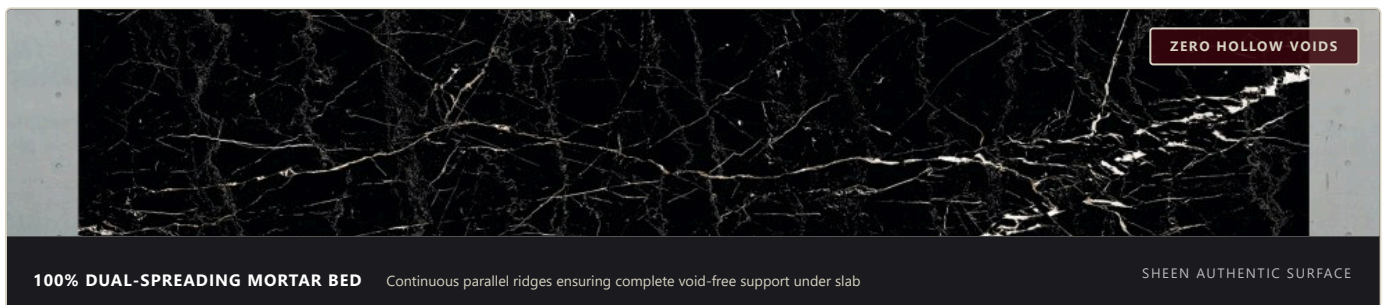


FIGURE 6.1 — APPROVED STRAIGHT PARALLEL RIDGE COMBING VS. PROHIBITED SWIRL / CROSS-HATCH COMBING

Substrate Layer: Comb mortar with a 12mm slanted notch trowel held at a consistent 60° angle, producing tall, straight, parallel ridges.

Slab Reverse Layer: Apply a continuous 2mm scrape/comb coat across 100% of the slab back, ensuring complete wetting of the reverse ceramic body.





MORTAR COVERAGE

Achieving 95%+ Interior & 100% Wet Bed Coverage

ANSI A108.19 coverage criteria, the lift-and-inspect test, and void elimination.

1. Minimum Mortar Coverage Standards

In accordance with **ANSI A108.19** and **TCNA Handbook standards**, large format slabs must achieve verified solid bed coverage:

- **Interior Dry Commercial & Residential Floors:** Minimum **95% continuous mortar bed coverage**, with no voids exceeding 12 cm² and 100% solid coverage beneath all slab corners and edges.
- **Exterior Facades, Wet Rooms & Heated Floors:** Mandatory **100% solid, void-free mortar bed coverage**. Zero allowable voids.

2. The "Lift & Inspect" Quality Test

During installation, the lead installer must perform the "Lift & Inspect" test on the first set slab and at least once every 50 square meters:

- Lay and beat down a test slab into fresh mortar.
- Immediately lift the slab back up using the vacuum carrying frame.
- Inspect the mortar bed: All combed ridges must be completely collapsed into a continuous, solid, void-free layer.

VISIBLE RIDGES ON LIFT = FAILURE

If un-collapsed ridges or dry spots remain visible on the lifted slab back, the trowel notch is too small, the mortar has skinned over, or beating pressure was inadequate.



RIDGELINE PHYSICS

Adhesive Combing Direction — Parallel Ridges Only

Parallel ridgelines along shortest axis, air escape dynamics, and swirl prohibitions.

1. The Parallel Combing Rule

Mortar ridges on the substrate and mortar ridges on the slab back MUST be combed in **straight, parallel lines running in the SAME direction** (typically parallel to the short side of the slab).

Combing in parallel lines provides an open exit path for air to escape. When the slab is vibrated down, air flows freely out through the parallel channels. Cross-hatching or circular swirls trap air pockets that cannot escape.

2. Shortest Path Air Escape

Always comb ridges parallel to the **shortest dimension of the slab (the 1200mm side)**. This minimizes the distance air must travel to reach the outer edge, ensuring maximum ridge collapse.

3. Combing Direction Summary

Combing Technique	Status	Engineering Consequence
Parallel Ridges (Short Side)	MANDATORY	Air escapes freely; 100% ridge collapse achieved
Cross-Hatch Combing (90° Grid)	PROHIBITED	Traps grid of air pockets; leaves 30% hollow voids
Circular Swirl Combing	PROHIBITED	Encloses air bubbles; severe hollow spot failure

CONSISTENT TROWEL ANGLE

Maintain a uniform 60° angle when combing to produce even ridge heights across the entire floor.



OPEN TIME DYNAMICS

Open Time, Adjustability & Ambient Climate Rules

The finger-tack test, skinned mortar removal rules, and hot climate working windows.

1. Open Time vs Adjustability Time

Two distinct chemical time windows govern mortar installation:

- **Open Time (Class E $\geq$ 30 min):** The maximum time after spreading mortar during which a slab can be embedded and still achieve full bond. If mortar "skins over" (surface develops dry dull film), it will NOT bond to the slab.
- **Adjustability Time (typically 15–20 min):** The window during which an embedded slab can be repositioned or leveled without breaking the developing crystalline bond.

2. The "Finger Tack" Test

Touch the combed mortar ridges with a clean, dry fingertip. If wet mortar transfers completely to your finger, the open time is active. If your finger remains clean and dry, the mortar has **skinned over**.

SCRAPE AWAY SKINNED MORTAR

If mortar has skinned over due to hot weather, wind, or delays, **NEVER wet it with water or comb fresh mortar over it**. Scrape skinned mortar completely off the floor with a trowel, discard in trash, and spread fresh mortar.

Ambient Temperature	Effective Open Time
15°C – 20°C (Standard)	25 – 30 Minutes
25°C – 30°C (Warm)	15 – 20 Minutes
> 30°C (Hot / Dry Wind)	< 10 Minutes (Spread only 1 slab area at a time)



SLAB PLACEMENT

Slab Positioning & Placement with Vacuum Frames

Hinged book-cover lowering technique, joint spacer alignment, and frame release timing.

1. Coordinated Team Lowering

Positioning a 3.2-meter slab into wet mortar requires synchronized movement. Four installers lift the carrying frame, transport the slab over the bed, and hover 50mm above the target location.

Align the slab with joint spacers at the adjoining tile. Lower the slab **hinged from one edge down across the mortar** (like closing a book cover). Lowering one edge first forces air forward ahead of the slab, preventing trapped air bubbles.

2. Avoid Dropping Slabs

NEVER drop a slab flat onto the mortar bed from height. Dropping traps air pockets and can splash mortar up through joint lines onto polished faces.



Hover Slab 50mm Above Target Bed



Align Joint Spacers on Adjacent Edge



Lower First Long Edge into Mortar



Roll Remaining Slab Down Progressively



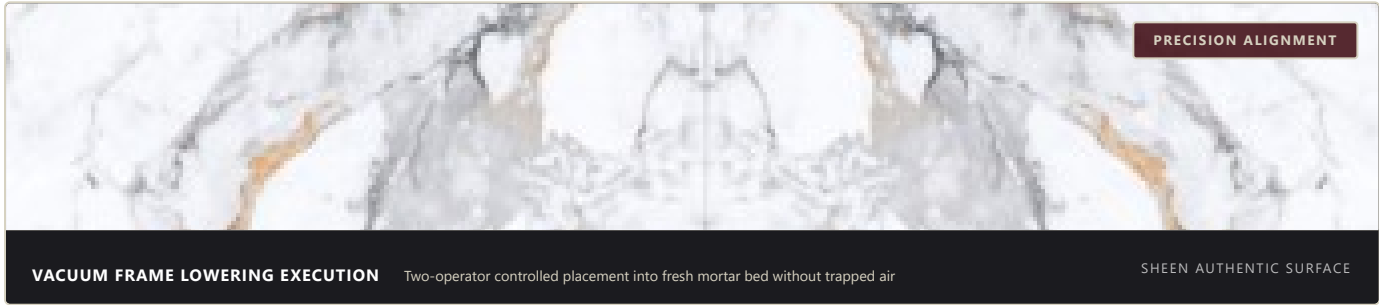
Check Vacuum Pressure Gauges on Frame



Begin Air Expulsion Beating Immediately

SUCTION FRAME RELEASE TIMING

Keep the carrying frame suction cups attached until the slab has been beaten down and initial leveling clips engaged.



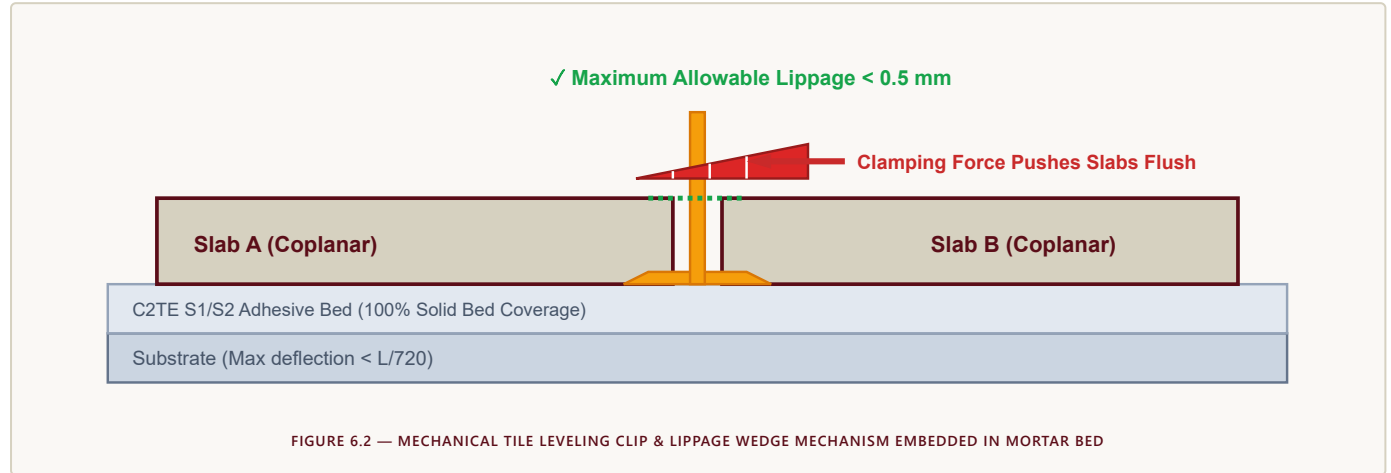


LEVELING CLIPS

Mechanical Tile Leveling Systems & Lippage Wedges

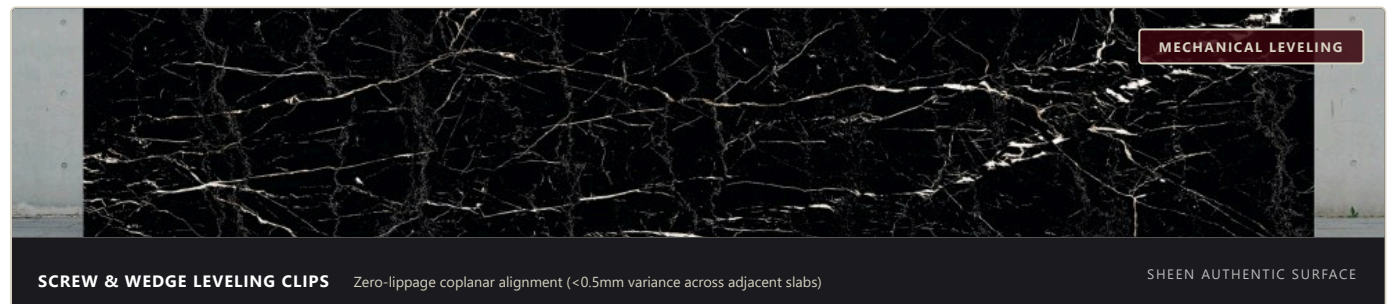
Technical vector diagram: Base clip insertion, wedge traction pliers, and coplanar flush jointing.

Mechanical tile leveling systems (e.g., Raimondi RLS, Peygran, Perfect Level Master) are mandatory for large format slabs. They mechanically force adjacent slab edges into exact coplanar alignment, overcoming natural manufacturing curvature.



Base Clip Insertion: Slide plastic base clips beneath the slab edges into fresh mortar at intervals of **300 mm to 400 mm** along all perimeter joints, with clips placed 100mm from each corner.

Tension Wedge Tightening: Insert high-strength polymer wedges using calibrated traction pliers. The clamping force draws both slab surfaces into exact flush alignment (< 0.5mm lippage).





LIPPAGE TOLERANCE

Lippage Control Tolerances (< 0.5mm Standard)

ANSI A108.19 lippage thresholds, feeler gauge audits, and raking light inspections.

1. International Lippage Tolerances

Lippage is the vertical height differential between edges of adjacent installed tiles. In large format installations, high lippage creates trip hazards, chips under rolling cart wheels, and casts unsightly dark shadows under raking light.

In accordance with **ANSI A108.19** and **ISO 13006**, the maximum allowable lippage for large format rectified sintered slabs is **0.5 mm (0.02 inches)** with a 2.0mm joint width.

2. The Coin & Feeler Gauge Test

Slide a standard credit card or feeler gauge across the joint. If the card edge strikes a raised slab edge, lippage exceeds allowable limits and must be adjusted before mortar cures.

3. Allowable Lippage by Joint Width Table

Joint Width	Max Allowable Lippage (ANSI A108.19)
1.5 mm (Walls)	≤ 0.5 mm (1/50")
2.0 mm (Floors)	≤ 0.5 mm (1/50")
3.0 mm (Heated Floors)	≤ 0.8 mm (1/32")
5.0 mm (Exterior)	≤ 1.0 mm (1/25")

RAKING LIGHT INSPECTION

Inspect joints under raking side-light (work lamp held near floor plane). Dark shadow lines reveal lippage immediately.



SOFT JOINTS

Movement & Perimeter Soft Joints Architecture

Thermal expansion physics, 6mm perimeter soft joints, backer rods, and polyurethane sealants.

1. Soft Joint Physics

Sintered porcelain slabs expand and contract with temperature shifts. A 20-meter building run of porcelain expands approximately 2.4mm across a 20°C temperature swing.

To absorb this thermal movement without building up destructive compressive stress, all room boundaries and field division bays require **flexible soft joints** filled with high-performance silicone or polyurethane sealant.

2. Perimeter Joint Execution

Maintain an un-grouted **6.0 mm (1/4") gap** along all walls, columns, curbs, and door thresholds. Insert closed-cell polyethylene foam backer rod into the joint cavity and seal flush with neutral-cure silicone.

3. Sealant Material Standards

Movement Joint Location	Approved Sealant Material
Interior Perimeter Walls	Neutral-Cure Mildew-Resistant Silicone
Commercial Field Expansion Bays	High-Modulus Polyurethane (e.g., Sikaflex 11FC)
Exterior Ventilated Facades	Structural UV-Resistant Neutral Silicone
Shower Wall Internal Corners	Sanitary 100% Silicone (Anti-mold)

NEVER FILL PERIMETER WITH GROUT

Filling the perimeter wall gap with cement grout locks the floor rigid. Upon thermal expansion, slabs will buckle and shear off the concrete screed.



| SECTION 7 • SLAB INSTALLATION DIVISION

STEP-BY-STEP SLAB INSTALLATION

Pre-cleaning, dual mortar combing, air pocket expulsion, 45° miter corners, and curing periods.

KEY TECHNICAL MODULES IN THIS SECTION:

- Pre-laying slab reverse cleaning and bonding primer application
- Air pocket expulsion with manual rubber beating blocks & orbital vibrators
- 45° external mitered corners (Jolly cuts) & epoxy edge jointing
- Mandatory 24 to 48-hour post-setting curing period before grouting



FEATURED DESIGN: INVISIBLE WHITE • LEVELING CLIPS & ZERO-LIPPAGE JOINT TUNING



SLAB PRE-CLEANING

Pre-Laying Underside Cleaning & Reverse Priming

Ceramic dust removal, damp sponge decontamination, and slurry bond coats.

1. Ceramic Reverse Decontamination

During factory manufacturing and transit, the reverse waffle back of porcelain slabs accumulates fine ceramic firing dust, packaging cardboard fibers, and handling grease. Applying adhesive directly over dusty slabs results in poor bond strength.

Mandatory Procedure: Place the slab on the cutting table face-down. Wipe the entire reverse ceramic face thoroughly with a damp microfiber sponge rinsed in clean water. Remove all surface dust fines.

2. Reverse Slurry Primer (Slurry Bond Coat)

For demanding commercial floors and exterior facade panels, apply a thin slurry bond coat of liquid polymer bonding admixture (e.g., Mapei Planicrete) mixed with C2 adhesive powder across the slab back before combing the mortar bed.

THE CLEAN SPONGE STANDARD

Rinse sponges in clean water buckets frequently. If sponge water becomes cloudy with ceramic dust, replace water immediately.



MORTAR SPREADING

Applying Mortar Bed — Dual-Spreading Execution

Substrate keying coat, 12mm slanted combing, and 2mm slab back buttering.

1. Substrate Spreading Sequence

Work methodically across an area large enough for only ONE or TWO slabs at a time to prevent adhesive skinning:

- Apply a thin scrape coat of C2TE S1/S2 mortar using the flat side of the trowel, keying adhesive into substrate pores.
- Immediately apply additional mortar and comb with a **12mm slanted notch trowel** held at 60°, pulling in straight parallel lines along the short slab axis.

2. Slab Back Buttering Sequence

Using a flat margin trowel or 4mm notch trowel, spread a continuous **2mm thick butter coat** across 100% of the slab back, combing parallel to the substrate ridges.

3. Mortar Thickness Summary

Mortar Layer	Wet Thickness
Substrate Combed Layer	~ 8 mm – 10 mm standing ridges
Slab Back Butter Layer	~ 2 mm continuous film
Collapsed Final Mortar Bed	4 mm – 6 mm solid cured bed

NEVER BUILD UP OVER 8MM

Do not attempt to use tile adhesive mortar thicker than 8mm to correct massive substrate dips. Excess mortar thickness shrinks during curing, pulling slabs out of level. Use self-leveling compound first.



SETTING WORKFLOW

Team Lifting & Lowering into Fresh Mortar Bed

Synchronized 4-person lowering, hinged edge contact, and squeeze-out cleaning.

1. Synchronized Team Execution

Four installers engage the vacuum carrying frame, lifting the buttered slab smoothly off the workbench. Walk the slab to the mortar bed, maintaining vertical on-edge orientation.

Hover the slab directly over target coordinates. Check alignment against adjacent set slabs with 2.0mm joint spacers.

2. The "Hinged Book" Setting Action

Lower the long edge of the slab into the mortar bed first. Slowly roll the slab downward like closing a book cover. This progressive contact line drives air forward ahead of the slab, preventing air entrapment.

3. Placement Safety Checklist

- ☐ Vacuum Indicators Checked Green on All 8 Cups
- ☐ All 4 Workers In Position at Lifting Handles
- ☐ Hover Directly Over Combed Bed
- ☐ Lower First Edge 5mm from Adjacent Slab
- ☐ Roll Down Smoothly; Zero Dropping Shock
- ☐ Insert Base Leveling Clips Immediately

CLEAN JOINT CAVITIES

Immediately wipe any mortar squeeze-out from the open joint cavity using a damp sponge before inserting leveling clips.



AIR EXPULSION

Air Pocket Expulsion — Beating Blocks & Vibrators

Electric orbital tile vibrators (10,000 VPM), rubber beating floats, and void elimination.

1. The Necessity of Active Air Expulsion

Merely placing a heavy slab onto combed ridges will NOT collapse the mortar. Large format slabs have immense surface area; human weight walking across the slab is insufficient to expel air.

Active mechanical air expulsion is mandatory to crush the combed mortar ridges into a continuous, void-free monolithic bed.

2. Manual Rubber Beating Blocks

Beat the slab surface firmly using an industrial **rubber beating float or anti-bounce white polyurethane mallet**. Work systematically from the center of the slab outward toward the edges along the ridgeline direction.

3. High-Frequency Orbital Tile Vibrators

For 1200x2800mm and 1200x3200mm slabs, the certified standard is an **electric cordless vibrating suction machine (e.g., Montolit Battivibro, Raimondi Volpe Vibrator)**. Operating at 5,000 to 10,000 vibrations per minute, the high-frequency micro-oscillations liquefy thixotropic mortar, expelling 100% of air voids in seconds.

NEVER USE STEEL HAMMERS

Never strike porcelain slabs with metal hammers or unbuffered wooden 2x4 blocks. Point shock causes immediate star fracture cracks.



CLIP INSTALLATION

Mechanical Leveling Clips Perimeter Placement

300mm to 400mm clip spacing, traction plier calibration, and mortar cavity cleaning.

1. Leveling Clip Spacing Architecture

Immediately after beating down the slab, slide mechanical leveling clip bases beneath the slab edges into the fresh mortar bed:

- Install clips at maximum intervals of **300 mm to 400 mm (12" to 16")** along all perimeter edges.
- Position the first clip **100 mm (4")** from every corner vertex.
- A standard 1200 x 2800 mm slab requires approximately **22 to 26 leveling clips** around its perimeter.

2. Traction Pliers Calibration

Insert leveling wedges into the clip windows. Tighten wedges using calibrated traction pliers. Adjust the plier stop screw so that uniform tension is applied without snapping the plastic clip stem prematurely.

ADHESIVE SQUEEZE-OUT CLEANING

Ensure mortar does not squeeze up around the plastic clip stem. Clean excess mortar out of the joint cavity with a margin trowel so the clip stem will snap cleanly off below the tile surface during post-cure removal.



JOINT CALIBRATION

Calibrating Spacers & Coplanar Alignment Checks

Calibrated 2.0mm cross spacers, 2m straightedge alignment, and glaze sponge cleaning.

1. Grout Joint Width Calibration

While leveling clips pull slabs vertically coplanar, they can allow minor lateral movement. Install calibrated **cross-spacers** or **T-spacers (minimum 2.0 mm / 3/32")** at all corners and joints to lock joint widths uniform.

Check linear alignment across long joint lines using a 2-meter straightedge and laser line. Adjust joints with soft rubber shims if alignment drifts.

2. Coplanar Verification Audit

- | | |
|---|--|
| ☐ Fingernail Test: Smooth Transition Across All Joints | ☐ Straightedge Test: Lippage ≤ 0.5 mm Verified |
| ☐ Joint Width Uniform at 2.0mm Across Entire Run | ☐ Wedges Locked Under Tension |
| ☐ Wipe Glaze Surface Clean of Mortar Smears | ☐ Erect Barricades; Post "NO WALKING" Signs |

SPONGE CLEAN IMMEDIATELY

Wipe all wet mortar smears off the polished slab glaze immediately with clean warm water. Cured polymer-modified mortar is extremely difficult to remove once hardened.



MITERED CORNERS

Mitered External Corners — 45° Jolly Cuts

45° wet rail saw cuts, 1.0mm blunt arris rules, and solid corner mortar backing.

1. The 45° Jolly Miter Corner

On external wall corners, columns, and shower curb edges, modern architectural design avoids plastic or metal trim profiles, favoring seamless **45° mitered jolly corners**.

Both mating slab edges are precision mitered at **45.0°** using a wet diamond rail saw or specialized 45° angle grinder guide (e.g., Montolit Pro-Gres Jolly, Raimondi BC45).

2. The 1.0mm Blunt Arris Rule

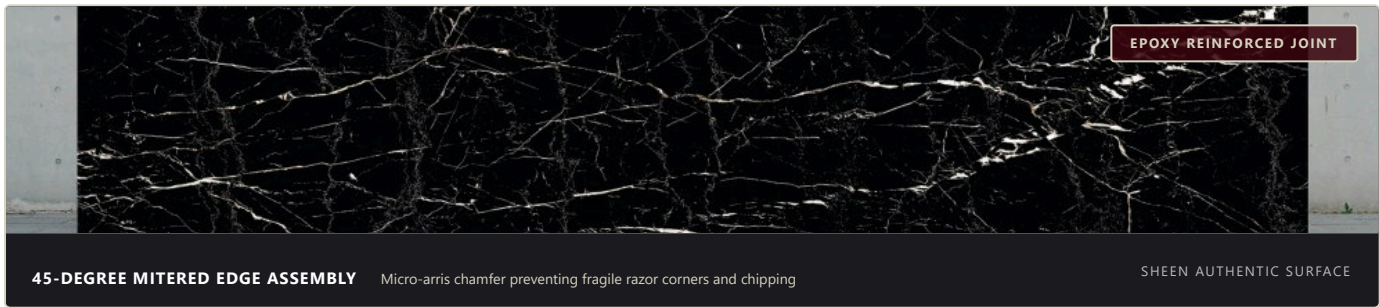
NEVER CUT MITERS TO A RAZOR-SHARP KNIFE EDGE (0.0mm). A knife-edge miter chips under the slightest contact. Always leave a **1.0 mm blunt flat arris** on the glazed face edge. When joined, the two 1mm arrises form a subtle 2mm micro-chamfer joint.

3. Joint Filling & Epoxy Bonding

Corner Component	Engineering Standard
Miter Cut Angle	45.0° with 1.0mm blunt arris
Internal Cavity Bonding	C2TE S1 mortar + color-matched epoxy
Joint Clamping System	Mitre Clamps / Blue high-tack tape cross-strapping
External Corner Profile	Micro-beveled arris (1.5mm to 2.0mm radius)

SOLID BED UNDER CORNERS

External mitered corners are vulnerable to impact. Ensure 100% solid mortar bed support directly behind both mitered edges with zero hollow voids.





INTERNAL CORNERS

Internal Corner Detailing & Structural Slip Joints

Wall-to-wall movement gaps, sanitary neutral silicone seals, and backer rod rules.

1. Internal Corner Movement Dynamics

Internal wall-to-wall corners and wall-to-floor junctions are structural movement planes. When buildings settle or framing timbers expand, walls shift independently.

NEVER TILE TIGHTLY INTO INTERNAL CORNERS. Maintain a minimum **2.0 mm to 3.0 mm expansion gap** between the perpendicular intersecting slabs.

2. Flexible Sanitary Silicone Sealing

Never fill internal corners with rigid cement tile grout. Grout will crack and crumble within months. Seal all internal corner transitions with color-matched **100% sanitary neutral silicone sealant**.

3. Internal Corner Joint Matrix

Plane Transition	Gap Allowance	Approved Sealant
Wall-to-Wall Internal Corner	2.0 mm – 3.0 mm	100% Sanitary Neutral Silicone
Wall-to-Floor Transition	3.0 mm – 5.0 mm	Flexible Silicone Soft Joint
Shower Wall-to-Pan Junction	3.0 mm – 5.0 mm	Mildew-Resistant Sanitary Silicone

FOAM BACKER ROD INTEGRATION

For gaps exceeding 4mm, insert a 6mm closed-cell polyethylene foam backer rod before applying silicone. This ensures two-sided adhesion, allowing the silicone to stretch freely.



TRANSITION JUNCTIONS

Wall-to-Floor Transition Junctions & Skirtings

Walls-first trade sequence, ledger rails, and floor protection drop cloths.

1. Sequence of Installation: Walls First vs Floor First

In standard architectural tiling, the recommended trade sequence is **"WALLS FIRST, FLOOR SECOND"**:

- Install wall slabs starting from the second row up, supported on a temporary level ledger rail.
- Install the floor slabs completely, running them under the bottom wall course.
- Install the bottom bottom-cut wall slab course (or skirting baseboard), overlapping the floor joint.

2. Wall-to-Floor Soft Joint Execution

The horizontal perimeter joint between the bottom of the wall slab/skirting and the floor slab must be sealed with a flexible silicone soft joint (minimum 3mm height) rather than rigid cement grout.

FLOOR PROTECTION DURING WALL WORK

If floor slabs are installed first, cover the entire floor with 3mm corrugated plastic sheets (Coroplast) and thick drop cloths before setting wall slabs.



WET AREA DETAILING

Wet Area Installation — Showers, Niches & Drains

Shower niche forward sloped sills (2.0%), linear drain integration, and waterproof collars.

1. Shower Pan & Niche Detailing

Recessed shampoo niches are major focal points in luxury bathrooms. All niche sills must be sloped forward at minimum **2.0% (1:50)** toward the shower to prevent standing water accumulation.

Clad niche jambs, headers, and sills with mitered 45° slab pieces, bonding with waterproof epoxy mortar over continuous tanking membrane.

2. Linear Drain Integration

Set the floor slabs directly up to the stainless steel linear drain body. Maintain a continuous 2mm perimeter joint around the drain frame, sealed with sanitary silicone.

3. Wet Area Inspection Standards



Niche Sill Sloped Forward $\geq 2.0\%$



Shower Pan Slopes 1.5% to Linear Drain



All Internal Corners Sealed with Silicone



100% Solid Mortar Bed (Zero Voids)



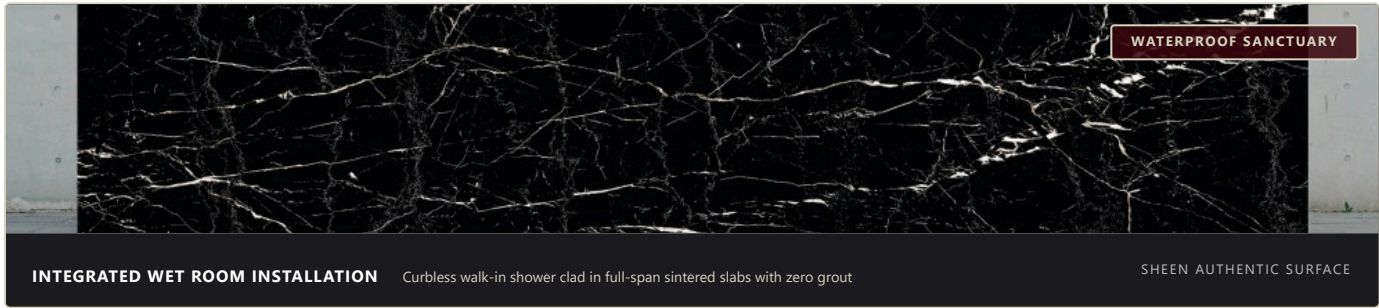
Plumbing Holes Sealed with Waterproof Collars



Drain Flange Integrated with Tanking Sheet

NO NEGATIVE SLOPE ON SILLS

A niche sill sloping backward into the wall cavity causes water pooling that will eventually degrade grout lines.





FACADE CLADDING

Ventilated Facade Mechanical Anchor Clamping

Keil undercut anchors, aluminum agraffe rails, and open-joint pressure equalization.

1. Exterior Mechanical Anchorage

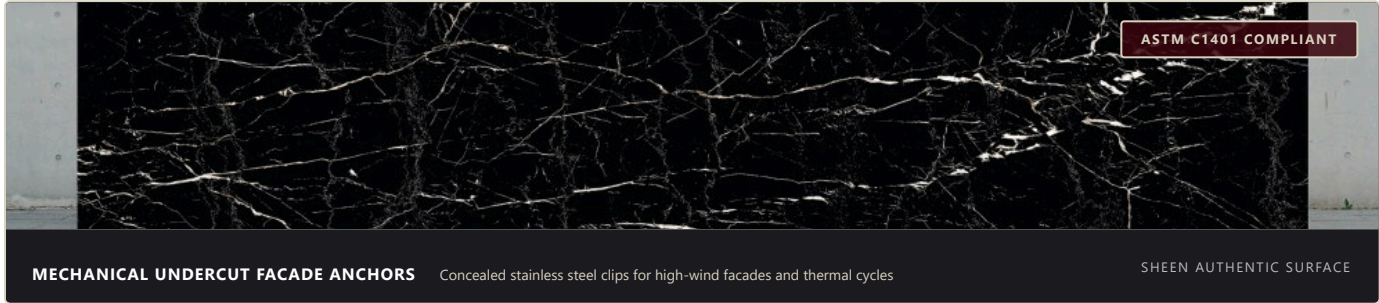
On exterior ventilated building envelopes, sintered slabs must be secured to vertical aluminum substructure rails using certified mechanical fixing systems:

- **Concealed Undercut Anchors (Keil System):** Expanding stainless steel undercut anchors drilled into pre-milled reverse blind holes (7mm deep on 12mm slabs). Anchors fasten to horizontal hanging brackets (agraffes).
- **Structural Chemical-Mechanical Hybrid:** High-modulus structural polyurethane/epoxy adhesive tape paired with stainless fall-arrest safety retention hooks.

2. Facade Joint Openings (Open-Joint System)

Ventilated facades typically feature **open horizontal and vertical joints (6mm to 8mm width)** without silicone caulk, allowing continuous cavity pressure equalization and drainage.

Facade Parameter	Engineering Standard
Slab Gauge	12 mm (Recommended) or 9 mm
Safety Mesh Backing	Mandatory fiberglass epoxy backing
Joint Width (Open Joint)	6 mm – 8 mm continuous open joint
Substructure Metal	Extruded Aluminum Alloy 6063-T6





CURING DISCIPLINE

Post-Setting Curing Period (24 to 48 Hours)

Crystalline hydration windows, 48-hour traffic bans, and rapid-set alternatives.

1. The Critical Hydration Window

Large format non-porous sintered slabs drastically restrict the evaporation of water from cementitious mortar. Adhesive cures significantly slower beneath a 3.2m porcelain slab than beneath porous tiles.

A MINIMUM POST-SETTING CURING PERIOD OF 24 TO 48 HOURS IS MANDATORY BEFORE REMOVING LEVELING CLIPS OR GROUTING.

2. Prohibited Premature Walking

Walking across freshly installed slabs within 24 hours breaks the developing microscopic polymer-cement crystalline bond, creating permanent hollow debonding spots beneath the floor.

3. Curing Time Requirements Table

Mortar Formulation	Light Foot Traffic Allowed	Grouting Authorized	Heavy Commercial Traffic
Standard C2TE S1 Mortar	Min 24 Hours	Min 24 – 48 Hours	Min 14 Days
Rapid-Setting C2FE S1 Mortar	4 – 6 Hours	6 – 8 Hours	3 – 5 Days
Cool Climate (< 15°C)	Min 48 Hours	Min 72 Hours	Min 21 Days

KEEP BARRICADES UP

Lock room doors or erect sturdy physical barricades across entrances with visible warning signs: "FRESH TILE MORTAR CURING — ZERO TRAFFIC FOR 48 HOURS."



SECTION 8 • SLAB INSTALLATION DIVISION

GROUTING, FINISHING & SURFACE PROTECTION

Grout chemistry, clip removal, diagonal float compacting, sponge washing, and protection film.

KEY TECHNICAL MODULES IN THIS SECTION:

- High-performance cementitious (CG2WA) vs reactive epoxy (RG) grouts
- Mechanical leveling clip removal by lateral mallet impact
- Diagonal rubber float joint compacting and sponge emulsification
- Temporary jobsite surface protection with breathable membrane sheeting



FEATURED DESIGN: MULTY CARRARA • FLEXIBLE POLYMER GROUTING & PERIMETER JOINTS



GROUT CHEMISTRY

Grout Selection — CG2WA vs Reactive Epoxy RG

CG2WA high-performance cement grouts vs RG epoxy, and non-scratch fine aggregates.

1. Grout Chemistry Classification

Large format slab installations require high-performance grouts certified under **ISO 13007 / EN 13888**:

- **CG2WA Cementitious Grout:** Improved cementitious grout with high abrasion resistance (A) and reduced water absorption (W). Polymer-enriched, fine aggregate formulation that will not scratch polished slab glazes.
- **RG Reaction Resin (Epoxy Grout):** Two-part or three-part 100% solids epoxy grout. Completely non-porous, stain-proof, and chemically resistant. Mandatory for commercial kitchens, public pools, and luxury wet rooms.

2. Grout Selection Matrix

Application Setting	Recommended Grout Class	Approved Brands
Living Room / Bedroom Floors	CG2WA High-Performance	Mapei Ultracolor Plus • Laticrete PERMACOLOR
Shower Walls & Pans	RG Epoxy or CG2WA	Mapei Kerapoxy CQ • Laticrete SPECTRALOCK
Commercial Kitchens / Bars	RG Epoxy Grout (Mandatory)	Ardex WA • Mapei Kerapoxy
Exterior Facades	CG2WA Deformable	Mapei Ultracolor Plus

SANDED GROUT SCRATCH WARNING

NEVER use coarse-sanded traditional cement grouts on high-gloss polished porcelain slabs. Coarse quartz silica sand will scratch the glossy glaze during float application. Always use **fine-aggregate CG2WA or non-abrasive epoxy**.



CLIP REMOVAL

Leveling Clip Removal & Joint Cavity Cleaning

Lateral mallet strike technique, breaking notch mechanics, and joint vacuuming.

1. Leveling Clip Removal Technique

Leveling clips must be removed **ONLY** after the mortar bed has cured for at least **24 hours**. Attempting to remove clips while mortar is green will dislodge slabs and break bond lines.

Lateral Strike Method: Strike the plastic leveling clip stem sharply with a white rubber mallet or steel-toed work boot **PARALLEL TO THE JOINT LINE**. The clip stem is engineered with a subterranean breaking notch that snaps cleanly off below the tile surface.

2. Never Pull Clips Upward

NEVER PRY OR PULL CLIPS UPWARD

Striking clips perpendicular to the joint or prying them upward with pliers will chip the porcelain arris and leave plastic tabs protruding above the floor.

3. Joint Cavity Vacuuming

Before applying grout, vacuum all joint lines thoroughly using an industrial vacuum fitted with a crevice nozzle. Grout cavities must be clean and cleared to at least **two-thirds of the slab thickness (minimum 4mm to 6mm depth)** to ensure durable grout anchoring.



GROUT APPLICATION

Grout Application Technique — Diagonal Rubber Float

45° diagonal compacting technique, 90° clean-off passes, and full-depth cavity packing.

1. Diagonal Compacting Float Technique

Apply grout using a hard rubber float (green epoxy float) held at a **45° angle to the slab face**. Spread the grout diagonally across the joint lines in smooth sweeping passes.

Working diagonally forces grout deep into the joint cavity, completely filling all subterranean voids without dragging the float edge into the joint channel.

2. 90° Squeegee Clean-Off Pass

Once joints are fully packed, hold the rubber float at a sharp **90° angle** and scrape diagonally across the slab face to remove excess surface grout, leaving only a thin residual haze.

3. Grouting Application Parameters

Stage	Technique Specification
Float Angle (Compacting)	45° Angle to surface, moving diagonally across joints
Float Angle (Clean-Off)	90° Knife-edge pass to remove bulk surface mortar
Batch Size	Mix only what can be applied and washed within 30 min
Joint Fullness	Full-depth compaction flush with tile bevel arris

EPOXY GROUT WORKING TIME

Epoxy grouts possess rapid chemical reaction times (pot life ~ 45 minutes). Wash epoxy haze off the slab face immediately using designated epoxy wash emulsifiers.



GROUT WASHING

Sponge Emulsification & Immediate Clean Wash

Single-pass diagonal sponge technique, over-washing hazards, and roller wash buckets.

1. The Initial Hydro-Sponge Wash

Allow cementitious grout to firm up in the joints (typically **15 to 30 minutes** after application, when grout is firm to a light finger touch and does not stick to fingertips).

Using a dense hydro-sponge dampened with clean water, emulsify the surface haze using light, circular scrubbing motions. Keep the sponge damp, NOT soaking dripping wet.

2. The Single-Pass Drag Technique

For the final rinse pass, rinse the sponge thoroughly in clean water, squeeze out excess water, and drag the flat sponge face in a **single continuous diagonal pass** across the joints. Turn the sponge to its clean side for the next pass. Rinse frequently.

3. The Over-Washing Hazard

NEVER USE EXCESS WATER WHEN WASHING

Dripping wet sponges and excessive water wash cement pigment binders out of the joints, causing hollow washed-out joints, color shading blotches, and powdery efflorescence. Squeeze sponges firmly before touching the floor.

Wash Tool	Approved System
Wash Bucket	Dual-roller wash bucket system (e.g., Raimondi Pedalo)
Sponge Type	Hydro-sponge / Cellulose sponge with cut grid slots
Water Replacement	Change wash water every 15 square meters



SURFACE PROTECTION

Temporary Jobsite Surface Protection Systems

Breathable Ram Board membranes, efflorescence prevention, and airtight plastic bans.

1. Protecting the Finished Investment

Once grouting is complete and cured for 24 hours, the finished floor must be fully protected from subsequent construction trades (painters, drywallers, electricians, trim carpenters).

Dropped tools, metal ladder feet, grit under work boots, and scaffolding wheels will scratch and gouge even the hardest polished porcelain glazes.

2. Breathable Protection Membrane Mandate

Cover the floor with a **breathable, heavy-duty floor protection membrane (e.g., Ram Board, Builder Board)** topped with 3mm corrugated plastic sheets (Coroplast) in heavy traffic corridors.

3. The Plastic Sheeting Prohibition

NEVER USE IMPERVIOUS POLYETHYLENE PLASTIC

Never cover a freshly grouted floor with airtight, non-breathable clear plastic sheeting or tape. Non-breathable plastic traps curing water vapor, causing severe calcium carbonate efflorescence (white salt bloom) that permanently stains dark grout joints. ALWAYS use **breathable vapor-permeable boards**.

Protection Material	Suitability
Breathable Ram Board / Builder Board	MANDATORY (Vapor-permeable impact protection)
Corrugated Plastic (Coroplast)	EXCELLENT (Over breathable board)
Airtight Polyethylene Plastic Sheeting	PROHIBITED (Causes efflorescence staining)





SECTION 9 • SLAB INSTALLATION DIVISION

POST-INSTALLATION CARE, QC & HANDOVER

Initial acid wash cleaning, maintenance routines, troubleshooting matrix, and 10-year warranty.

KEY TECHNICAL MODULES IN THIS SECTION:

- Initial acid wash haze removal protocol using buffered sulfamic acid
- Routine cleaning regimens using neutral pH non-film-forming detergents
- Master large format installation troubleshooting matrix
- Contractor quality assurance checklist and Sheen 10-Year Architectural Warranty



FEATURED DESIGN: BLUE AGATHA PRECIOUS SLAB • QUALITY CONTROL HANDOVER



ACID WASH CLEANING

Initial Acid Wash Cleaning — Cement Haze Removal

Buffered sulfamic acid detergents, pre-wetting joint saturation, and neutralization rinsing.

1. The Post-Installation Acid Wash Mandate

After cementitious grout has cured for **4 to 7 days**, microscopic polymer-cement haze film remains bonded to the surface glaze. This haze dulls the gloss and attracts airborne construction dust.

Execute an **initial post-installation acid wash cleaning** using a buffered, concentrated acid detergent (e.g., Fila Deterdek, Mapei Keranet, Lithofin KF Cement-Residue Remover).

2. Pre-Wetting Grout Joints

CRITICAL REQUIREMENT: Thoroughly saturate all grout joints with clean water before applying acid cleaner. Pre-wetting fills grout pores with water, preventing acid from penetrating and weakening the grout joint binder.

3. Acid Wash Application Step-by-Step

Step	Protocol Required
1. Pre-Wet Joints	Soak joints with clean water using sponge
2. Dilute Cleaner	Dilute buffered acid cleaner 1:5 to 1:10 with water
3. Apply Solution	Spread solution evenly over floor; let dwell 5 to 10 minutes
4. Scrub Surface	Scrub with single-disc floor buffer or white abrasive pad
5. Vacuum Liquid	Extract dirty slurry with industrial wet vacuum
6. Neutralize & Rinse	Rinse twice with generous clean water; vacuum dry

NEVER USE RAW MURIATIC / HYDROCHLORIC ACID

Never use unbuffered raw muriatic (hydrochloric) acid. Raw acid emits corrosive fumes that rust stainless steel appliances, chrome fixtures, and electrical wiring. Use **buffered sulfamic acid detergents only**.



ROUTINE CARE

Routine Cleaning & Neutral Detergent Maintenance

Neutral pH cleaners, microfiber flat mops, and wax/oil soap prohibitions.

1. Daily & Weekly Maintenance Standards

Sintered porcelain is the most hygienic and durable architectural surface available. Thanks to complete vitrification and near-zero porosity (< 0.06%), surfaces require minimal maintenance:

- Sweep or vacuum daily using soft-bristle attachments to remove abrasive foot grit.
- Mop weekly with a clean microfiber flat mop dampened with warm water and **neutral pH non-filming floor detergent (pH 6 to 8)** (e.g., Fila Cleaner Pro, Lithofin KF Conditioning Cleaner).
- Rinse mop frequently in clean water; change wash water every 50 m².

2. Prohibited Maintenance Products

NEVER USE WAX OR OIL SOAPS

STRICTLY PROHIBITED: Never use oily soaps (Murphy's Oil Soap), pine-oil cleaners, or topical liquid floor waxes on sintered porcelain. These products deposit a greasy polymer film that traps dirt, creating dark streaks and rendering the floor dangerously slippery.

Stain Category	Approved Specialized Spot Cleaner
Grease / Cooking Oils	Alkaline Degreaser (Fila PS87 / Lithofin Wexa)
Coffee / Red Wine / Beer	Oxidizing Bleach Cleaner (Fila SR95)
Rubber Heel Scuff Marks	Undiluted Neutral Cleaner or Isopropyl Alcohol
Limescale Mineral Deposits	Buffered Acid Cleaner (diluted Fila Deterdek)



TROUBLESHOOTING

Master Slab Installation Troubleshooting Matrix

Hollow sound remediation, lippage correction, transverse crack causes, and grout repairs.

This diagnostic matrix addresses field installation defects encountered during large format slab tile installations and specifies mandatory engineering remediation protocols.

Problem Observed	Root Cause	Approved Engineering Remediation
Hollow Sound on Tapping	Incomplete back-buttering; swirl trowel pattern; dried skinned mortar	Remove hollow slab before mortar hardens. Scrape bed clean. Re-spread with 12mm slanted notch trowel in parallel lines, 100% butter slab back, and vibrate down with electric tile vibrator.
Lippage Catch (> 0.5mm)	Uneven substrate; leveling clips spaced too wide; insufficient wedge tension	Adjust wedges while mortar is fresh (< 20 min). If mortar has cured, lippage cannot be ground down on porcelain. The affected slab must be removed with diamond grout saw and re-laid flat.
Transverse Slab Crack	Substrate expansion joint bridged; floor deflection > L/720; hollow void	Demolish cracked slab. Inspect substrate for cracks. Install crack-isolation decoupling membrane (Schluter Ditra) with structural expansion joint projecting through the tile line. Re-lay slab.
Grout Cracking / Crumbling	Butt-jointed slabs (joint < 1.5mm); deflection; over-watered grout	Rake out damaged grout using diamond oscillating blade. Re-grout with high-performance CG2WA or epoxy grout mixed with exact water ratio. Ensure flexible silicone at perimeters.
White Haze Bloom on Slabs	Cement grout residue; covered with airtight plastic during curing	Execute post-installation acid wash using buffered sulfamic acid cleaner (Fila Deterdek) diluted 1:5. Scrub with floor buffer, vacuum wet slurry, and neutralize with clean water rinse.



CONTRACTOR QA

Contractor Quality Assurance & Lippage Survey Form

10-point contractor compliance gate covering lippage, coverage, joints, and cleaning.

Prior to project handover, the tiling contractor and site quality manager must audit and execute this comprehensive Quality Assurance inspection sheet.

☐ Substrate Level Audit Verified (< 2mm over 2m)	☐ 100% Back-Buttering Executed on All Slabs
☐ Mechanical Leveling Clips Engaged at 350mm	☐ Lippage Survey Passed: All Joints ≤ 0.5 mm
☐ Joint Widths Uniform (Min 2.0mm on Floors)	☐ Perimeter Expansion Soft Joints (6mm) Silicone Sealed
☐ Field Movement Bays Divided at Max 16 m ²	☐ Zero Hollow Tapping Sounds on Solid Bed
☐ Buffered Acid Wash Haze Removal Executed	☐ Breathable Floor Protection Sheeting Installed

Project / Contractor Name: _____	Lead QA Inspector Signature: _____	Date: __ / __ / 2026
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HANDOVER PROTOCOL

Site Handover Protocol & Client Sign-Off Form

Formal joint client-contractor acceptance certificate, punch list sign-off, and attic stock.

Upon completing final inspection, clean-down, and protective membrane installation, the contractor and client must execute this formal handover document.

☐ Complete Visual Inspection Under Full Room Lighting

☐ Zero Scratches, Chips, or Surface Blemishes

☐ All Grout Lines Full, Uniform, and Color-Consistent

☐ Perimeter Silicone Caulk Neatly Tooled

☐ Matching Spare Tile Attics Stock Delivered (Min 2%)

☐ Owner Maintenance Guide Handed Over in Person

CLIENT HANDOVER & ACCEPTANCE CERTIFICATE

"The client / architect hereby acknowledges receipt of the completed large format sintered porcelain slab tile installation. All surfaces and joints have been inspected and accepted in full compliance with project specifications."

Client Representative: _____

Signature: _____

Date: __ / __ / 2026



WARRANTY TERMS

Sheen 10-Year Sintered Slab Warranty Terms

Official 10-year architectural warranty terms, scope, exclusions, and online registration.

1. Scope of 10-Year Warranty Coverage

Sheen Overseas Private Limited warrants to the original project owner that first-quality Sintered Porcelain Slabs will be free from manufacturing structural defects, frost damage, glaze delamination, and material non-conformities under ISO 13006 / EN 14411 Group Bla for a period of **10 years** from the date of shipment.

This warranty applies strictly when slabs are installed in compliance with this installation manual, using certified C2TE S1/S2 adhesives, back-buttering, and minimum 2.0mm joint widths.

2. Warranty Exclusions

- Damage resulting from substrate structural failure or deflection exceeding L/720.
- Slabs installed with spot-bonding (dot and dab) or zero-grout butt joints.
- Chipping or cracking resulting from improper cutting without inside relief radii.
- Normal wear and tear or building seismic settlement movement.

3. Warranty Registration Certificate

10-YEAR ARCHITECTURAL SLAB WARRANTY	
Project Name:	_____
Installation Address:	_____
Slab Batch / Shade Lot:	_____
Tiling Contractor:	_____
Completion Date:	___ / ___ / 2026

Register online at www.sheenoverseas.com/warranty/ within 90 days.

Claims Service: In the event of a verified manufacturing defect, Sheen Overseas will replace defective tiles on an FOB port basis.



CONTACT DIRECTORY

Global Technical Support Directory & Export Desk

Morbi manufacturing facility, international ports of loading, and BIM downloads.

1. Global Technical Inquiries Directory

Sheen Overseas provides direct technical engineering support for international project tenders, high-rise facade engineering, commercial specifications, and tile contractor training programs.

- **Head Office & Plant:** National Highway 8-A, Sartanpar Road, Morbi - 363642, Gujarat, India
- **International Technical Desk:** contact@sheenoverseas.com
- **Global Export Department:** export@sheenoverseas.com
- **Phone / WhatsApp Business:** +91 90819 09090 / +91 98252 09090
- **Official Web Portal:** www.sheenoverseas.com

2. Global Shipping & Logistics Ports

Port Facility	Logistics Role
Mundra Port (INMUN)	Primary Container Terminal • 210 km from Plant
Kandla Port (INIXY)	Secondary Deepwater Breakbulk • 190 km from Plant
Pipavav Port (INPAV)	Alternative Dedicated Container Terminal

DIGITAL ARCHITECTURAL DOWNLOADS

Download high-resolution seamless CAD textures (3200x1600 px), BIM Revit families, and laboratory ASTM test certificates at www.sheenoverseas.com/technical-specs/.