UHPC General Technical Data Sheet - Custom Architectural Elements

PRELIMINARY U.S. TECHNICAL DATA SHEET | Aug 28, 2026

1. Material Overview

Ultra-High Performance Concrete (UHPC) is a high-performance, fiber-reinforced cementitious composite used for custom architectural elements where high strength, durability, relatively thin sections, and complex geometry may be required. Structura's manufacturing routes include casting/molded placement and spray production, selected according to the actual geometry, reinforcement, finish, handling, and project requirements. Typical applications include custom facade cladding and feature elements, molded or curved components, returns, L- and U-shaped elements, perforated elements, cornices, window surrounds, and landscape or amenity components. Final element thickness, reinforcement, backing/frame configuration, embedded inserts, connection design, and performance criteria are project-specific.

Technical status note: Test Report Reference No. 202504HW129 (27 April 2025) and Test Report Reference No. 202501DW220G1 (18 April 2025) provide third-party results under the identified Chinese methods for specific tested UHPC specimens/configurations. These results are supplemental technical reference information for the tested specimens/configurations and do not establish universal design values, connection capacity, or complete facade-system qualification. For U.S. projects, the applicable UHPC material qualification, connection testing, fire evaluation, mock-up/system testing, and project engineering will be established as required for the actual product configuration, project loads, exposure, specification, and governing code.

2. Product Information, Current Evidence and U.S. Qualification Status

Item	Current Reference Information / U.S. Position
Material Name	Ultra-High Performance Concrete (UHPC).
Primary Applications	Custom architectural facade and rainscreen cladding elements; molded and curved features; returns; L- and U-shaped elements; perforated components; cornices; window surrounds; landscape and amenity components; and other project-specific architectural elements.
Manufacturing Processes	Casting/molded placement and spray production are selected according to the element geometry and required reinforcement. Casting is used for flat, perforated-flat and other molded configurations where appropriate. Spray production is used for complex curved, returned, L- and U-shaped and other geometry-intensive forms. The selected process, fiber system, reinforcement and production controls remain project/configuration specific.
Fiber / Reinforcement Options	Depending on process and project configuration, reinforcement may include POM synthetic fibers (typically about 0.24-0.47 in. / 6-12 mm), steel fibers (about 0.47-0.59 in. / 12-15 mm), stainless-steel fibers (about 0.47-0.59 in. / 12-15 mm), and/or approximately 1.18 in. (30 mm) AR-glass reinforcement for selected spray-process elements. Local mesh, reinforcing bars or other reinforcement may also be incorporated

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	where required. AR-glass reinforcement alone is not used as the basis for UHPC classification.
UHPC Classification Basis	The manufacturer reports that its UHPC classification basis includes applicable Chinese UHPC standards such as GB/T 31387-2025, JC/T 60034-2026, T/CBMF 171-2022 and T/CBMF 172-2022, as applicable to the material/product/process. These references describe the manufacturer's Chinese classification basis.
Curing	Natural curing is typically approximately 28 days. Controlled steam curing may be used, particularly during winter production. Final curing requirements may be adjusted to the formulation, production process, project schedule, test basis and required acceptance criteria.
Typical Architectural Thickness	Typical UHPC shell/panel thickness is approximately 0.59-1.18 in. (15-30 mm). Thinner or thicker local sections may be feasible subject to element geometry, reinforcement, handling, transport, connection design and project-specific engineering.
Secondary Steel Backing / Reinforcement	Elements above approximately 32 sq ft (3 m^2) are typically reviewed for possible secondary steel backing/frame requirements, but 3 m^2 is a review trigger only and not a fixed engineering threshold. Long, narrow, highly irregular, deeply returned, perforated or otherwise demanding elements below this area may also require backing or local reinforcement. Final requirements are project-specific.
Density / Unit Weight	Supplemental Chinese-standard result: approximately 137 pcf (2.2 g/cm^3) dry bulk density for the tested spray-process, glass-fiber-reinforced UHPC panel specimen. Source: Test Report Reference No. 202501DW220G1. General production density and piece weight vary with formulation, geometry, thickness, reinforcement and backing.
Reference Panel Sizes / Custom Fabrication	Common reference sizes include 47.2 x 94.5 in. (1,200 x 2,400 mm), 48.0 x 118.1 in. (1,220 x 3,000 mm), and 59.1 x 141.7 in. (1,500 x 3,600 mm). Custom sizes and geometries are available subject to project-specific engineering, mold/fabrication limits, handling, transport and installation requirements.
Surface Finishes / Color Options	Available finishes may include smooth/as-cast, matte, sandblasted, acid-etched, cast-stone textures, timber-grain textures, brick-textured finishes, custom mold textures, integral pigmentation, and applied coating systems. Final color, texture and sheen are subject to approval by physical sample and/or project mock-up.
Use Environment / Intended Use	Exterior and interior architectural applications. These custom UHPC elements are not represented by this TDS as a complete structural or facade system. Each element, reinforcement/backing frame, insert and connection must be engineered for the applicable project loads and support conditions.

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Compressive Strength	Supplemental Chinese third-party result: approximately 20.94 ksi (144.4 MPa). Referenced Chinese requirement: >=17.40 ksi (>=120 MPa). Tested in accordance with GB/T 50081-2019 as referenced in Test Report Reference No. 202501DW220G1.
Flexural Strength / MOR	Supplemental Chinese third-party result: proportional-limit strength approximately 2.05 ksi (14.1 MPa) and ultimate flexural strength approximately 4.41 ksi (30.4 MPa). Test specimens were approximately 9.84 x 1.97 x 0.39 in. (250 x 50 x 10 mm), 12 pieces. Test method: GB/T 15231-2023, Section 8; acceptance basis: T/CBMF 171-2022 for the tested spray-process, glass-fiber UHPC exterior-wall-panel configuration. Source: Test Report Reference No. 202504HW129.
Water Absorption	Supplemental Chinese third-party result: 1.5%. Source: Test Report Reference No. 202501DW220G1; GB/T 15231-2023 cited as the test basis.
Impact Resistance	Supplemental Chinese third-party result: approximately 1,912 ft·lbf/ft² (27.9 kJ/m²). Source: Test Report Reference No. 202501DW220G1; GB/T 15231-2023 cited as the test basis.
Water Impermeability	Supplemental Chinese third-party result: after 24 hours of water exposure, no damp marks or water droplets were observed on the reverse side of the tested panel specimen. Source: Test Report Reference No. 202501DW220G1; GB/T 7019-2014 cited as the test basis. This material/specimen observation does not establish air/water performance of a complete facade assembly.
Weather / Freeze-Thaw Resistance	Supplemental Chinese third-party result: after 200 freeze-thaw cycles, no delamination, spalling or other visible damage was reported for the tested configuration. Source: Test Report Reference No. 202501DW220G1; GB/T 15231-2023 cited as the test basis. Any U.S. freeze-thaw qualification will be established as required for the specific project.
Shrinkage	Supplemental Chinese third-party result: 0.01%. Source: Test Report Reference No. 202501DW220G1; JC/T 1057-2021 cited as the acceptance basis.
Fire Performance	Current manufacturer reference: Chinese A1 fire-classification evidence. The exact governing Chinese classification/report should be provided where relied upon. The Chinese A1 classification basis is separate from applicable U.S. material and wall-assembly fire-test requirements. U.S. fire requirements will be established as required for the specific project.
UHPC Premix / Purchased-Material Data	Available technical data from the UHPC premix and other purchased-material manufacturers should be maintained and may be provided separately upon request. Supplier-based values are not incorporated into this TDS as verified finished-product performance unless their applicability to the actual production UHPC has been reviewed and supported.
Previous Supplier /	Generic reference values previously listed for Poisson's ratio, chloride

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Reference Values	permeability, coefficient of thermal expansion, tensile strength and modulus of elasticity have been removed from this general TDS pending review of the applicable supplier/manufacturer data or representative testing for the actual product configuration.
Embedded Inserts / Connection Qualification	Cast-in or embedded steel/stainless-steel inserts and connection components may be used where appropriate. Final connection capacities require evaluation/testing of the actual insert, embedment, edge distance, panel thickness, reinforcement, loading direction, conditioning, failure mode, redundancy and project-specific engineering.
Chinese Test Reports / Evidence Boundary	Test Report Reference Nos. 202504HW129 and 202501DW220G1 are third-party Chinese laboratory evidence for the specific tested specimens/configurations. They are not project-specific facade qualification reports and do not establish universal performance across all casting, spray, fiber, thickness, geometry, reinforcement, backing-frame or connection configurations.
U.S. Project-Specific Qualification	For U.S. projects, applicable UHPC material qualification and testing will be determined based on the proposed product configuration and project requirements. Material testing using relevant ASTM/AASHTO methods, connection qualification, structural engineering, fire evaluation, mock-up/system testing and AHJ/design-team review will be addressed as required.
Production QC / Baseline Process	Baseline production QC includes incoming-material verification; batching and water/binder control; mold preparation; mixing and fiber-dispersion control; casting or spraying and vibration/de-airing as applicable; shell thickness, inserts/back anchors and local reinforcement checks; initial cure and demolding; curing; surface finishing; dimensional/flatness/appearance inspection; batch/project-equivalent specimens where required; final acceptance; piece/batch identification; and production records. Project-specific inspection, test plans and hold points may be added where required.
Dimensional Tolerances	Current factory baseline: plan dimensions +/-0.08 in. (+/-2 mm); surface flatness <=0.08 in. (<=2 mm); thickness +/-0.08 in. (+/-2 mm); complex/curved geometry +/-0.12 in. (+/-3 mm). Final tolerances should be established on approved project shop drawings and coordinated with geometry, interfaces, insert/backing locations, joint design and installation requirements.
Typical Fixing Approaches	Mechanically dry-fixed systems using engineered steel brackets/anchors connected to secondary facade framing or supporting structure may be used. Face-fixed or other systems may also be used where specifically designed. Final attachment, subframing, fasteners and corrosion protection are project-specific.
Design Considerations	Element and connection design should account for self-weight, wind and seismic loads where applicable, handling and erection loads, thermal/differential movement, corrosion protection, joint design, tolerances, access, transport, installation adjustment and the actual

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	support/substrate conditions.
Facade-System Boundary	The UHPC element is one component of the facade and does not by itself establish complete wall performance. Air/water control, drainage, insulation, membranes, flashings, joints, perimeter conditions, structural support, fire performance and interfaces with adjacent construction must be coordinated and verified at the project/system level.
Packaging and Transport	Components may be shipped in timber crates, steel A-frames or project-specific transport frames. Protect arrises, returns, projecting profiles and finished surfaces. Packaging and restraint should minimize torsion, impact and localized point loading during handling and transport.
Installation	Install in accordance with approved shop drawings, project-specific engineering and site requirements. Verify component dimensions and supporting conditions before installation; use specified anchors and corrosion-protection measures; maintain required joints and interfaces; control alignment/tolerances; protect finished work; and comply with applicable site-safety requirements.
Maintenance	Clean with clean water and a pH-neutral detergent unless otherwise recommended for the selected finish. Periodically inspect sealant joints, coatings, anchors, visible cracking, impact damage, staining and other project-specific maintenance items.
Warranty	Project-specific warranty terms and conditions are available subject to the final product, finish/coating system, engineering scope, installation responsibility, exposure conditions and contract requirements.

PRELIMINARY U.S. ISSUE – PROJECT-SPECIFIC QUALIFICATION / TESTING AS REQUIRED