PITTSBURGH CORNING™

DIVISION 4 – MASONRY
SECTION 04270 GLASS UNIT MASONRY

PART 1 – GENERAL

This specification has been prepared by Pittsburgh Corning Corporation using generally accepted and appropriate technical information but is not intended to be solely relied upon for the specification design or technical applications. Having no control over the elements of design, installation, workmanship or site conditions, Pittsburgh Corning assumes that the actual design choices and installation will be made by persons trained and qualified in the appropriate disciplines. Therefore, Pittsburgh Corning disclaims all liability potentially arising from the use or misuse of this specification.

1.1 Section Includes

A. Glass Block Units, hollow or solid
B. Integral Joint Reinforcement
C. Mortar

1.2 Related Sections

A. Steel Channels
B. Sills, lintels, jambs
C. Sealant (caulk)
D. Packing Material

1.3 References

A. ASTM A82—Spec. for Cold Drawn Steel Wire
B. ASTM A153—Class B-2, Spec. for Zinc Coating (Hot dip) on Iron and Steel Hardware (Canada same)
C. ASTM A167, Spec. for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
D. ASTM A580, Spec. for Stainless Steel Wire
E. ASTM C144, Spec. for Aggregate for Masonry (Canada – A179-94)
F. ASTM C150, Spec. for Portland Cement (Canada – CAN/CSA-A5-93)
G. ASTM E2010 and NFPA 257, Fire Test of Window Assemblies (equivalent to UL® 9 and CAN 4-S106-M80)
H. ASTM C207, Spec. for Hydrated Lime for Masonry Purposes (Canada same)
I. ASTM C270, Spec. for Mortar for Unit Masonry (Canada – A179-94)
J. ASTM D1187, Type II—Spec. for Asphalt-Base Emulsions (For Metal Surfaces)
K. K. ASTM D1227, Type III—Spec. for Emulsified Asphalt (For Porous Surfaces)

1.4 System Description

A. Knowledge of the following basic information is essential for proper installation of Pittsburgh Corning Glass Block units:

1. Glass block panels shall not be designed to support structural loads.
2. Maximum deflection of structural members supporting glass block panels shall not exceed L/600.
3. Sills of all panels must be painted with a heavy coat of asphalt emulsion and must cure for two hours before first mortar bed is placed.
4. Provision for expansion, movement and isolation of the glass units from the surrounding frame must be made at jambs and heads of all panels. Mortar must not bridge expansion spaces.
5. Mortar should be mixed and applied in accordance with the recommendations of Pittsburgh Corning Corporation. See Mortar Materials. Because glass block will not absorb water, mortar must be considerably stiffer than mortar for ordinary masonry. The consistency can be described as "mashed potatoes" or "peanut butter" and be clay-like. The joints must be full and struck smooth, not sponged.
6. Design and installation of glass block projects should be done by whole units since cutting glass block is not recommended.

1.5 Submittals

A. Product Data
Submit two (2) copies of manufacturer's literature and two (2) copies of manufacturer's installation instructions.

B. Samples
1. Submit two (2) glass block units of each type specified, showing size, design and pattern of faces.
2. Submit representative samples of (panel reinforcing), (panel anchors), (expansion strips), and (sealant).

C. Test Reports —Fire Tests
Submit documents verifying glass block units are classified for a ¾, 1 or 1½-hour fire exposure according to ASTM E2010, Underwriters Laboratories of Canada CAN 4-S106-M80, UL® 9, or NFPA 257 "Fire Tests of Window Assemblies." All such glass block unit cartons shall carry appropriate UL® labels.

1.6 Storage and Protection

A. Store unopened cartons of glass block in a clean, cool, dry area.
B. Protect opened cartons of glass block against windblown rain or water run-off with tarpaulins or plastic covering.

1.7 Project/Site Conditions

A. Do not install glass block units when temperature is 40°F (4°C) and falling. Maintain the temperature of glass unit masonry above 40°F (4°C) for the first 48 hours after construction.

1.8 Warranty

A. Pittsburgh Corning Corporation offers a limited 5-year warranty on Pittsburgh Corning Glass Block units.

PART 2 – PRODUCTS

2.1 Acceptable Manufacturers

A. The drawings and specifications are based on catalog data, specifications and products of Pittsburgh Corning Corporation and designate the type and quality of work intended under this section.

1. Products of other manufacturers proposed as equivalent quality must be submitted through the bidding contractors for written approval of the architect ten days prior to the bid date.
2. Supporting technical data, samples, published specifications and the like must be submitted for comparison.
3. Contractor shall warrant that proposed substitutions, if accepted, will provide performance equivalent to the materials specified herein.
4. These specifications have been developed by Pittsburgh Corning Corporation based on extensive tests of panels composed of Pittsburgh Corning Premiere Series Glass Block masonry units as manufactured by Pittsburgh Corning Corporation. These specifications do not apply to panels made from glass block masonry units produced by any other manufacturer.

2.2 Glass Block Units

A. Glass block units, nominally _____ inch x _____ inch x _____ inch thick shall be partially evacuated hollow units made of clear, colorless glass with a polyvinyl butyral edge coating.
Pattern type: _____.

B. Thick faced glass block units, nominally _____ inch x _____ inch x _____ inch thick shall be partially evacuated hollow units made of clear, colorless glass with a polyvinyl butyral edge coating. Pattern type: THICKSET® 60 or 90 _____.

C. Solid glass units, nominally _____ inch x _____ inch x _____ inch thick made of clear colorless glass with a polyvinyl butyral edge coating. Pattern type: VISTABRIK® Solid Glass Block.
NOTE: Pittsburgh Corning Corporation offers a polyvinyl butyral edge coating for better bonding and to provide for an expansion/contraction mechanism for each block.

2.3 Accessories

A. Panel Reinforcing: two parallel 9 gauge wires either $1^{5}/_{8}$ inch or 2 inch on center with electrically butt-welded crosswires spaced at regular intervals, hot dipped galvanized after welding or Type 304 stainless steel, by Pittsburgh Corning Corporation.

B. Panel Anchors: 20 gauge perforated steel strips 24 inches long by 1¾ inches wide, hot dipped galvanized after perforation or 22 gauge by 16 inches long by 1¾ inches wide of Type 304 stainless steel, by Pittsburgh Corning Corporation.

C. Expansion Strips: made of polyethylene foam with a thickness of $^{3}/_{8}$ inch, by Pittsburgh Corning Corporation.

D. Asphalt Emulsion: a water-based asphalt emulsion, by Karnak Chemical Corp. (Karnak 100, 1-800-526-4236), or equal.

E. Sealant (caulk): non-staining, waterproof mastic, (silicone), (urethane), (_____) type.
Below is a list of the toll-free telephone numbers of the Technical Departments of the following sealant manufacturers:

- Dow Corning Corporation, 1-800-248-2481 in Midland, MI
- General Electric, 1-800-255-8886, in Waterford, NY
- Sonneborn Building Products, 1-800-243-6739 in Minneapolis, MN
- Tremco Incorporated, 1-800-321-7906 in Beachwood, OH. Below is information on the fire retardant sealant used on glass block fire tests:
- Fyre-Sil Silicone Sealant (for fire-rated construction), by Tremco, Inc. (1-800-321-7906)

F. Packing (Backer Rods): polyethylene foam, neoprene, fibrous glass or equal as approved by sealant manufacturer.
G. Channels (Aluminum): Available from Julius Blum & Company, Inc., 1-800-526-6293 in Carlstadt, NJ.

- Premiere Series (4' Glass Block) Use: 4½" x2" x $^{1}/_{8}$" size.
- VISTABRIK® and Thinline® Series (3" Glass Block) Use: 4" x 1½" x $^{1}/_{8}$" size.

2.4 Mortar Materials

A. Mortar: Limit cementitious materials in mortar to Portland Cement and lime. Type S in accordance with ASTM C270. Mortar shall be 1 part Portland Cement, ½ part lime, and sand equal to 2¼ to 3 times the amount of cementitious material (cement plus lime), all measured by volume. (For exterior glass block panels, an integral type waterproofer should be added to the mortar mix.) **No antifreeze compounds or accelerators allowed.**

NOTE: All model building codes also accept the use of Type N mortar.

B. Portland Cement: Type I in accordance with ASTM C150. If a waterproof Portland Cement is used, the integral type waterproofer shall be omitted. (Masonry Cement is not recommended.) Color: _____.
C. Lime: Shall be a dolomitic pressure-hydrated lime, special hydrate, Type S, in accordance with ASTM C207.
D. Sand: A clean, white quartzite or silica type, essentially free of iron compounds, in accordance with ASTM C144, not less than 100% passing a No. 8 sieve.
E. Integral Type Water-repellent: Stearate type by The Euclid Chemical Company (Integral Waterpeller® Powder, **Not Liquid**, 1-800-321-7628), or approved equal. Note: Add Integral Waterpeller® powder to dry mortar mix. Do not add powder to wet mortar mix.
F. External Type Water Proofer: Water based silane sealer type by BASF Corporation (HYDROZO ENVIROSEAL™ 40, 1-800-243-6739). Note: Remove excess sealer from glass surfaces soon after application.

PART 3 – EXECUTION

3.1 Preparation

A. Verify that (channels), (panel anchors) have been provided at head and jambs for the purpose of providing panel anchorage within the opening.
B. Mix all mortar components to a consistency that is drier than mortar for ordinary masonry. **(See Section 1.4, Item 5.)** Retempering the mortar after it has taken its initial set shall not be permitted. **Do not use antifreeze compounds or accelerators.**

C. ***Freshly mixed mortar may create skin irritation. Avoid direct contact where possible and wash exposed skin areas promptly with water. If any mortar gets into the eyes, rinse immediately with water and get prompt medical attention.***

3.2 Installation

A. Cover sill area with a heavy coat of asphalt emulsion. Allow emulsion to cure at least 2 hours before placing mortar.

B. Where panel anchors are used at jambs and heads in lieu of channel or chase surrounds, install panel anchors in the same joints (16 inches o.c. maximum starting after first course) where panel reinforcing will be laid. Panel anchors are to be embedded a minimum of 12 inches into the mortar joints.

C. Place or adhere expansion strips to jambs and head. Make certain expansion strip extends to sill and covers leg of panel anchor that is attached to jambs and head.

D. Set a full mortar bed joint, applied to sill.

E. Set lower course of block. Maintain a uniform joint width of ¼ to $^{3}/_{8}$ inch plus or minus $^{1}/_{8}$ inch. All mortar joints must be full and not furrowed. Steel tools must not be used to tap blocks into position. (Place a rubber crutch tip on end of trowel to tap block into position.) Do not realign, tap or otherwise move block after initial placement. For VISTABRIK® Solid Glass Block units, typical mortar joint is $^{3}/_{8}$ inch. Special VISTABRIK® spacers that provide a $^{3}/_{8}$ inch thick mortar joint are available.

F. Install panel reinforcing every 16 inches o.c. maximum (starting after the first course) in the horizontal mortar joints. Run reinforcing continuously from end to end of panels. Lap reinforcing not less than 6 inches whenever it is necessary to use more than one length. NOTE: In corrosive atmospheres (i.e. saline air, chlorine air, etc.), the use of stainless steel channels, reinforcing and panel anchors should be considered. Consult local building codes in coastal areas. For VISTABRIK® Solid Glass Block, use $1^{5}/_{8}$ inch wide reinforcing (same as Thinline® Series glass block). Do not bridge expansion joints with reinforcing. Install reinforcing as follows:

- **Place lower half of mortar in bed joint. Do not furrow.**
- **Press panel reinforcing into place.**
- **Cover panel reinforcing with upper half of mortar bed and trowel smooth. Do not furrow.**

G. Place full mortar bed for joints not requiring panel reinforcing – do not furrow. Maintain uniform joint width.

H. Set succeeding courses of block. Spaces at head of panel and jambs must remain free of mortar for caulking with sealant.

I. Use only wooden or rubber tipped tools when tapping glass blocks into place.

J. Strike joints smooth while mortar is still plastic and before final set. Remove surplus mortar from faces of glass blocks and wipe dry. (See Section 3.3.). Tool joints smooth and concave before mortar takes final set. At this time, remove and clean out all excess mortar from jambs, head and other locations.

K. After final mortar set (approximately 24 hours), install packing tightly between glass block panel and jamb and head locations. Leave space for sealant.

L. Apply sealant evenly to the full depth of recesses as indicated on the drawings and in accordance with the manufacturers' published application manual and instructions.

M. *All exterior glass block panels shall be well sealed to prevent water entry*.

3.3 Cleaning

A. Remove surplus mortar from the faces of the glass block at the time joints are struck or tooled. **Mortar should be removed while it is still plastic** using a clean, wet sponge or an ordinary household scrub brush with stiff bristles.

B. **Do not use harsh cleaners, acids (of any strength), abrasives or alkaline materials while cleaning glass block. Never use a wire brush to remove mortar from glass block surfaces.**

C. Final mortar removal is accomplished with a clean, wet sponge or cloth. Rinse sponge or cloth frequently in clean water to remove abrasive particles **that could scratch glass surfaces.** Allow any remaining film on the block to dry to a powder.

D. After all sealants, caulking, etc., have been applied, remove excess caulking materials with commercial solvents such as xylene, toluene, mineral spirits or naphtha and follow with normal wash and rinse. Be careful not to damage caulking by overgenerous application of strong solvents. Comply with solvent manufacturers' printed directions on label for toxicity and flammability warnings.

E. Final cleaning of glass block panels is accomplished after they are completely installed. Wait until panels are not exposed to direct sunlight. Start at the top of the panel and wash with generous amounts of clean water. Dry all water from the glass block surface. Change cloth frequently to eliminate dried mortar particles or aggregate **that could scratch the glass surface.** To remove the dry powder from the glass surfaces, use a clean, dry, soft cloth. For stubborn or hard to remove powder or stains, the use of an "extra fine" steel wool (grades 000 or 0000) is suggested. Try this first in an unobtrusive area.