

Specifiers: Click on the ¶ icon in the WORD toolbar to reveal detailed instructions

SECTION 07 42 13
METAL CEILING PANELS
Kingspan Insulated Panels
Kingspan K-Roc HF Series Insulated Ceiling Panel System

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Steel faced, mineral wool core fire resistive insulated ceiling panels for [interior partitions] [interior fire rated partitions] [and] [ceilings]
- B. Accessories including fasteners and perimeter trim

1.2 REFERENCES

A. ASTM International

- 1. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- 2. ASTM A755: Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
- 3. ASTM A792: Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
- 4. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
- 5. ASTM C165: Standard Test Method for Measuring Compressive Properties of Thermal Insulations
- 6. ASTM C303: Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation
- 7. ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- 8. ASTM C612: Standard Specification for Mineral Fiber Block and Board Thermal Insulation
- 9. ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- 10. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
- 11. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
- 12. ASTM E136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C
- 13. ASTM C1104: Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation
- 14. ASTM C356: Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat
- 15. ASTM E814: Standard Test Method for Fire Tests of Penetration Firestop Systems

B. Underwriters Laboratories (UL)

1. UL Canada (ULC) Approval:

- a. CAN/ULC-S101: Standard Methods of Fire Endurance Tests of Building Construction and Materials
- b. CAN/ULC-S114: Standard Method of Test for Determination of Non-Combustibility in Building Materials
- c. CAN/ULC-S115: Standard Method of Fire Tests of Firestop Systems
- d. CAN/ULC-S102: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

C. FM Global (FM)

1. Approval Standard 4880; Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems.

1.3 SUBMITTALS

A. Refer to Section [01 33 00 Submittal Procedures] [insert section number and title].

B. Product Data: Submit manufacturer current technical literature for each type of product.

C. Shop Drawings - Submit detailed drawings showing:

1. Profile
2. Gauge of both exterior and interior sheet
3. Location, layout and dimensions of panels
4. Location and type of fasteners
5. Shape and method of attachment of all trim
6. Locations and type of sealants
7. Installation sequence
8. Coordination Drawings: Provide elevation drawings and building sections which show panels in relationship to required locations for structural support. Include panel details and details showing attachment to structural support.
9. Other details as may be required for a weathertight installation

D. Panel Analysis: Provide panel calculations to indicate compliance with maximum deflection of [L/240] for the indicated ceiling design loads. The design load / deflection criteria and fastening pattern shall be verified from witnessed / audited tests using the "Chamber Method" in accordance with ASTM E72. Include effects of thermal differential between the exterior and interior panel facings.

E. Samples: Provide nominal 3 x 5 inch of each color indicated. [Provide panel width by 10 inches long minimum] [Insert size].

F. LEED Submittals:

1. Energy and Atmosphere (EA)

- a. Energy Analysis for Credit EA 1: Demonstrating percentage of performance improvement compared with the baseline building performance rating.

2. Material and Resources (MR)

- a. Product Certificates for Credit **[MR 4]** **[MR 4.1[and Credit MR 4.2]]**: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
- b. Product Certificates for Credit **[MR 5]** **[MR 5.1[and Credit MR 5.2]]**: For products and materials required to comply with requirements for regionally manufactured materials. Include statement indicating cost, location of manufacturer, and distance to Project for each regionally manufactured material.

3. Indoor Environmental Quality (IEQ)

- a. Product Data for Credit **[IEQ 4.1]** **[EQ 4.1]**: For sealants, including printed statement of VOC content
- b. Product Data for Credit **[IEQ 4.2]** **[EQ 4.2]**: For paints and coatings, including printed statement of VOC content

4. Innovation in Design (ID)

- a. **[Documentation for Credit [ID 1] [ID 1.1]: [Include specific requirements related to documenting credit.]**

G. Quality Assurance Submittals

- 1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
- 2. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of five (5) years experience in the production of fire resistive insulated metal panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.
- B. Installer Qualifications:
 - 1. Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Section [01 60 00 Product Requirements] [insert section number and title].
- B. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.
- C. Store ceiling panel materials on dry, level, firm, and clean surface. Stack no more than two bundles high. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.
- D. Mineral fiber core shall be protected from moist air, rain and UV during construction. Stored panels must be wrapped in plastic or tarpaulins. Protect exposed mineral fiber from rain or water with plastic sheet during installation.

1.6 WARRANTY

- A. Limited Panel Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. Coverage under the warranty includes panel performance, bond integrity, deflection and delamination.
 - 1. Warranty Period: Two (2) years from date of Substantial Completion, or 2 years and 6 months from the date of shipment from manufacturer's plant, whichever occurs first.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- ~~A.~~ Kingspan Insulated Panels Ltd. 5202-272nd Street, Langley, B.C. V4W 1S3 (866-442-3594) (www.kingspanpanels.ca)
- B. Basis of Design: Kingspan K-Roc HF
- C. Substitution Limitations:
 - 1. Submit written request for approval of substitutions to the Architect [a minimum of [14] days prior to the date for receipt of bids] [Insert time period]. Include the following information:
 - a. Name of the materials and description of the proposed substitute.
 - b. Drawings, cut sheets, performance and test data.
 - c. List of projects similar scope and photographs of existing installations.
 - d. Test reports indicating compliance with the performance criteria.
 - e. Other information necessary for evaluation.
 - 2. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.
 - 3. Substitutions following award of contract are not allowed except as stipulated in Division 01 – General Requirements.

2.2 CEILING PANELS

A. Performance Criteria:

1. Structural Test: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72. Deflection criteria shall be [L/240] [insert project specific deflection criteria].
2. Thermal Properties: The panel mineral fiber core shall provide an R-value of 3.8 per inch thickness when tested in accordance with ASTM C518.
3. Insulating Core:
 - a. Density: 8.5 lb. /cu. ft. +/- 10% or minimum 7.65 lb. /cu. ft., maximum 9.4 lb. / cu. ft.; in accordance with ASTM C303.
 - b. Combustibility: Combustible at 1382° F in accordance with ASTM E136.
 - c. Combustibility: Non-combustible when tested in accordance with ULC-S114.
 - d. Apparent thermal conductivity of mineral fiber core: Maximum “k” factor at 75° F. mean temp. - 0.26 Btu in/h ft² °F (R=3.8ft² °F h / Btu inch thickness) in accordance with ASTM C518.
 - e. Compressive Strength: Force applied parallel to fiber orientation (cut lamella pieces) Maximum 10% deformation at 9.2 KN of force in accordance with ASTM C165.
 - f. Dimensional stability: Linear shrinkage 0.2% max. at 1200° F in accordance with ASTM C356.
 - g. Moisture resistance: Water vapor absorption - 5% max. by weight in accordance with ASTM C1104.
 - h. Surface burning characteristics when tested in accordance with CAN/ULC S-102:
 - a) Flame Spread Rating: 0
 - b) Smoke Developed Classification: 0
 - i. Surface burning characteristics when tested in accordance with ASTM E84:
 - a) Flame Spread: 0
 - b) Smoke Developed: 5
4. Fire Test Response Characteristics: Steel-faced panels with mineral wool core shall comply with appropriate sections of Chapter 7 of the International Building Code regarding fire-resistance-rated construction. The following approval listings/test reports shall be available upon request for submission to the Authority Having Jurisdiction:
 - a. ASTM E119: Panels shall have successfully passed the requirements of this standard.
 - b. CAN/ULC-S101: Panels shall have successfully passed the requirements of this standard.
 - c. CAN/ULC-S115: Panel penetrations shall have successfully passed the requirements of this standard.
 - d. ASTM E814: Panel penetrations shall have successfully passed the requirements of this standard.

B. Panel Description:

1. Panel thickness: [6” – 60min], [6”- 90min], [8”- 2 hour]. thick.
2. Panel width: 42 inches.
3. Fire Rating: [6” – 60min], [6” – 90min], [8” - 2 hour].

4. Panel joint: Tongue and groove interlock joint.
5. Reveal: 1/8 inch, 3/8 inch
6. Exterior Face of Panel:

a. Material:

- 1) Steel coil material shall be in accordance with ASTM A755 ,Grade 33,[G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792],[Type 304 Stainless Steel].

b. Profile: [Shadowline].

- 1) Profile description: Linear striations nominal 0.0625 inch deep by 3/4 inches wide at 3 inches on center.
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [26] [24] [22]
- 4) [24 gauge Type 304 Stainless Steel]

c.)Profile: [Flat].

- 1) Profile description: Flat (unprofiled)
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [24] [22].
- 4) [Type 304 Stainless Steel 24ga – Flatness Waiver Required]

d. Profile: [Micro-Rib].

- 1) Profile description: Micro-Rib profile has linear 0.0625 inch deep fluted striations at 3/4 inches on center.
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [24] [22].

OR

e. Profile: [Mini Micro-Rib].

- 1) Profile description: Mini Micro-Rib profile has linear 0.040 inch deep fluted striations at 5/16 inches on center.
- 2) Texture: [Smooth].
- 3) Gauge: [24]

f. Profile: [Azteco].

- 1) Profile description: Azteco profile is flat.
- 2) Texture: Heavy (deeply) embossed.
- 3) Gauge: [24] [22].

g. Color: [Selected from the current Kingspan Insulated Panels stock color chart] [Custom color as selected by Architect] [Color indicated].

7. Interior Face of Panel:

a. Material:

- 1) Steel coil material shall be in accordance with ASTM A755 Grade 33,[G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792], [Type 304 Stainless Steel].

b. Profile: Shadowline.

c. Texture: [Non-directional stucco embossed] [Smooth].

d. Gauge: [26] [24], [Type 304 Stainless Steel 24ga]

- e. Interior Finish: [modified polyester, dry film thickness of 1.0 mil including primer.] [PVDF finish, dry film thickness of 1.0 mil including primer] [Vinyl Plastisol, 4.0 mil including primer].
- 1) Color: [USDA Imperial White] [Selected from the current Kingspan Insulated Panels stock color chart] [same as exterior finish] [Custom color as selected by Architect] [Color indicated].
- 8. Insulating Core: Rigid mineral wool insulation board, bonded with a thermal setting resin in accordance with ASTM C612.

2.3 ACCESSORIES

A. Fasteners:

- 1. [Exposed through-fasteners applied from the exterior side of the panel connecting both metal faces to supporting steel structure.]
- 2. Material: Hex-head type with steel and neoprene washer
- 3. Material: Pancake-Head type fastener
- 4. Size: As recommended by manufacturer.

B. Perimeter Trim and Manding Plates:

- 1. Required trim and metal flashing shall be steel with same coating, color, and gauge as the exterior face of the insulated metal ceiling panel,
- 2. 26ga Channel Cover Trim.

C. Plate Washer: 4"x4" 14ga Plate Washer

D. Mineral Wool: 8pcf density Rockwool strips, Comfortboard 80, or Curtainrock 80 mineral wool

E. Sealants:

- 1. Kingspan Butyl, non-skinning/curing, (per Kingspan K-Roc standard details) or type per panels manufacturer's recommendations
- 2. Kingspan SAFIRE Intumescent Mastic Sealant (per Kingspan K-Roc standard details) or type per panels manufacturer's recommendations

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Provide field measurements to manufacturer as required to achieve proper fit of the preformed ceiling panel. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.

- ~~B.~~ Supporting Steel: All structural supports required for installation of panels shall be by others.
- C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.
- D. Beginning of installation means acceptance of structure and supports for the installation of the insulated metal ceiling panels.

3.2 PANEL INSTALLATION

- A. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- B. Install suspension system and panels true-to-line to dimensions and layout indicated on approved shop drawings.
- C. Cut panels prior to installing, where indicated on shop drawings, using a power circular saw with fine tooth carbide tip blade per manufacturer's instructions. Personnel should wear respiratory and eye protection devices.
- D. Apply non-skinning butyl sealant and SAFIRE Intumescent Mastic as shown on shop drawings and manufacturer's installation instructions so as to complete the necessary vapor barrier and fire rating.

3.3 TRIM INSTALLATION

- A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.
- B. Place a continuous strip of butyl tape or butyl sealant on closure trims for the length of the panel to be covered as indicated on shop drawings.

3.4 CLEANING AND PROTECTION

- A. Remove protective film immediately after installation.
- B. Touch-up, repair or replace metal panels and trim that have been damaged.

END OF SECTION

DISCLAIMER:

Kingspan Insulated Panels Guide Specifications have been written as an aid to the professionally qualified Specifier and Design Professional. The use of this Guideline Specification requires the sole professional judgment and expertise of the qualified Specifier and Design Professional to adapt the information to the specific needs for the Building Owner and the Project, to coordinate with their Construction Document Process, and to meet all the applicable building codes, regulations and laws. KINGSPAN INSULATED PANELS EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OF THIS PRODUCT FOR THE PROJECT.