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RESEARCH REPORT: RR 25747
(CSI #13030)

Expires: June 1, 2020
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Code: 2017 LABC

GENERAL APPROVAL – Renewal - Aircooler Corporation Refrigeration Panels for Walk-In Coolers and Freezers.

DETAILS

The panels are fabricated in thickness of 3-1/2", 4, and 5". The core material is Dow Chemical Voracor CE157 and CE1004. The panel facings are 26 gauge galvalume metal ASTM A-653. The perimeters of the panels are formed with a kiln-dried 1-5/8" Douglas Fir No. 2 or better or high-density form. The panels are joined together with cam-activated locking devices with a maximum spacing of 48".

Frame spread and smoke development ratings for the panel per ASTM E84 are 20 and 300 respectively, and for foam only (tested alone) per UL 723 are 15 and 250 respectively. Density of the foam is 2.25 pcf

The panels are approved as structural wall and ceiling panel for use in interior for non-fire rated walk-in coolers and freezers. The allowable loads for exterior panels subject to wind loads shall be evaluated on a case by case basis.

Aircooler Corporation Refrigeration Panels for walk-in coolers and freezers described above are approved subject to the following conditions:

1. Use of the panels shall be limited to locations where combustible construction is permitted by the 2017 Los Angeles City Building Code.
2. The panels shall be fabricated in a shop of a licensed fabricator approved by the Los Angeles City Building & Safety Department. Fabrication in unlicensed shops will invalidate this approval.

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3. Complete plans and calculations, signed and stamped by a civil or structural engineer or architect registered in the State of California, shall be submitted to the structural plan check engineer for approval of each job.
4. The allowable loads for outdoor panels subject to wind loads shall be evaluated on a case by case basis.
5. A thermal barrier is required per Section 2603.4 of the 2017 Los Angeles City Building Code unless exempted per Section 2603.4.1.
EXCEPTION: The thermal barrier is not required if the cooler or freezer floor area does not exceed 400-square feet and the foam plastic insulation does not exceed a thickness of 4-inches.
6. A separate approval from the Electrical Testing Laboratory shall be required for electrical installations within the panels. Plumbing and waste line may extend at right angle through the wall panels but are not permitted vertically within the core.
7. A factor of safety of at least 2.5 is required. Design of building utilizing the panels shall be in accordance with the requirements of the 2017 Los Angeles City Building Code and the design data specified:

A. Maximum Allowable Loads for Ceiling Panels

| Panel Span (ft) | Panel Thickness (in.) | | | | | |
|--------------------|------------------------------|------------------------------|----------------------------|--------------------------|----------------------------|----------------------------|
| | t = 3.5 in. Wood frame | t = 3.5 in. Foam frame | t = 4 in. Wood frame | t=4 in. Foam frame | t = 5 in. Wood frame | t = 5 in. Foam frame |
| 10 | 46* | 21 | 53.5 | 24 | 67 | 30 |
| 12 | 32.5 | 14.5 | 37 | 16.5 | 46 | 21 |
| 14 | 24 | 10.5 | 27.5 | 12 | 34 | 15 |
| 16 | 18 | 8 | 21 | 9 | 26 | 11.5 |
| 18 | 14.5 | 6.5 | 16.5 | 7.5 | 20.5 | 9 |
| 20 | 11.5 | 5 | 13 | 6 | 16.5 | 7.5 |
| 22 | 9.5 | - | 11 | 5 | 13.5 | 6 |
| 24 | 7.5 | - | 9 | - | 11.5 | 5 |
| 26 | 6 | - | 7.5 | - | 9.5 | - |
| 28 | 5 | - | 6.5 | - | 8.5 | - |
| 30 | - | - | 5 | - | 7 | - |
| 32 | - | - | - | - | 6.5 | - |

* Computed load limited by shear stress

B. Allowable wall panel loads

| Panel height (ft) | Panel Thickness | | | | | |
|-------------------|-----------------|------------|------------|------------|------------|------------|
| | 3.5-in. | | 4.0-in. | | 5.0-in. | |
| | Wood Frame | Foam Frame | Wood Frame | Foam Frame | Wood Frame | Foam Frame |
| 10 | 720 | 465 | 750 | 485 | 770 | 510 |
| 15 | 612 | 285 | 655 | 325 | 690 | 385 |
| 20 | 398 | 35 | 508 | 105 | 580 | 200 |
| 25 | 200 | - | 341 | - | 440 | - |
| 30 | - | - | 130 | - | 275 | - |

Note: The allowable loads for outdoor panels subject to wind loads should be evaluated on a case-by-case basis.

C. Maximum allowable height of non-bearing wall panel

| Panel thickness | Wood Frame (ft.) | Foam Frame (ft.) |
|-----------------|------------------|------------------|
| 3 1/2" | 25 | 20 |
| 4" | 30 | 20 |
| 5" | 30 | 20 |

D. Maximum Allowable Loads for Kason Type 1156B Cam-Locking Devices:

| Connection | Shear (lbs) | | Tension (lbs) | |
|------------------|-------------|------------|---------------|------------|
| | Wood Frame | Foam Frame | Wood Frame | Foam Frame |
| Panel to Panel | 449 | 172 | 179 | 123 |
| Ceiling to Panel | 328 | 139 | 245 | 108 |

E. Base Connections: Wall panels are attached to the floor with a 16-gauge 1-1/2"x1-1/2" steel angle. The maximum allowable shear and tension loads are as follows:

| Type | Shear (lbs) | Tension (lbs) |
|------------|-------------|---------------|
| Wood Panel | 492 | 230 |
| Foam Panel | 479 | 214 |

F. Maximum Allowable Shear Load of Wall Panels (PLF):

| Height to Width Ratio | Allowable Shear (plf) | |
|-----------------------|-----------------------|-------------------|
| | Wood Frame Panels | Foam Frame Panels |
| 0.50: 1.0 | 380 | 240 MAX |
| 1.00: 1.0 | 190 | 120 |
| 2.00: 1.0 MAX | 95 | 60 |

G. Maximum Allowable Roof/Ceiling Diaphragm Shear

| Height to Width Ratio | Allowable Shear (plf) | |
|-----------------------|-----------------------|-------------------|
| | Wood Frame Panels | Foam Frame Panels |
| 1.00: 1.0 | 190 | 120 |
| 2.00: 1.0 MAX | 95 | 60 |

8. Locations of connectors must be detailed on approved plans, the spacing of connections shall be calculated for each job but not less than two per width of panel (Width of panel = 47”).
9. An approved fire retardant roof covering (class “A” or “B”) shall be place over the panel when used as exterior roof panels.
10. Each panel shall be stamped with the company name on the panel edge using an indelible ink, as shown on attachment 4.
11. All design values and methods not included in this report shall be in accordance with requirements of the 2017 Los Angeles City Building Code.

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DISCUSSION

The report is in compliance with the 2017 Los Angeles City Building Code.

The approval is based on tests on the foam per requirements of Sec. 2603 of the 2017 Los Angeles City Building Code, tests conducted in accordance with ASTM E-84 on the finished panels, and load tests conducted in accordance with ASTM E-72.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

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