### SECTION 09 50 00

### 09 54 46 FELTWORKS® Blades - VarAffix™ Acoustical Panels:

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

### 1.2 SUMMARY

1. Section Includes:
	1. Non-Woven layered and formed Polyester felt fiber ceiling panels
	2. Exposed grid suspension system.
	3. Wire hangers, fasteners, main runners, cross tees, wall angle moldings and accessories.
2. Related Sections:
	1. Section 09 53 00 - Acoustical Ceiling Suspension Assembly
	2. Section 09 20 00 - Plaster and Gypsum Board
	3. Section 09 22 16 - Non-Structural Metal Framing
	4. Section 01 81 13 - Sustainable Design Requirements
	5. Section 01 81 19 - Indoor Air Quality Requirements
	6. Divisions 23 (15) - HVAC
	7. Division 26 (16) Sections - Electrical Work
3. Alternates
	1. Prior Approval: Unless otherwise provided for in the Contract documents, submit proposed product substitutions no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect’s review and acceptance. Approved products will be set forth by the Addenda. If a substitution is included in a Bid and is not approved by an Addendum, the specified products shall be provided as in place of the substitute without additional compensation.
	2. Submittals, which do not provide adequate data for the product evaluation, will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); panel design, size, composition, color, and finish; suspension system component profiles and sizes; compliance with the referenced standards.

### 1.3 REFERENCES

1. American Society for Testing and Materials (ASTM):
	1. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
	2. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
	3. ASTM E580 Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.
	4. ASTM C423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
	5. ASTM E795 Standard Practices for Mounting Test Specimens During Sound Absorption Tests
	6. International Building Code
	7. ASHRAE Standard 62 1 2004 Ventilation for Acceptable Indoor Air Quality
	8. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.2 2017
	9. California Green Building Standards Code Cal Green Title 24
	10. NFPA 70 National Electrical Code
	11. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
	12. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
	13. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings
	14. Underwriters Laboratories Green Guard
	15. International Living Building Challenge

### 1.4 SUBMITTALS

1. **Shop Drawings:** Layout and details of ceilings. Show locations of items that are to be coordinated with or supported by the ceilings.
2. **Installation Instructions:** Submit manufacturer’s installation instructions as referenced in Part three, Installation.
3. **Product Data:** Submit manufacturer’s technical data for each type of ceiling unit and suspension system required.
4. **Samples:** 6”x 6” x 3/8” – sample of the colors
5. **Certifications:** Manufacturer’s certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
6. **Non-Conformance:** All products not conforming to the requirements of this specification and or the manufacturer’s published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.

### 1.5 QUALITY ASSURANCE

1. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
2. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
	1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with Class A products.
		1. Flame Spread: 25 or less
		2. Smoke Developed: 450 or less
3. Fire Sprinklers: Ceiling systems may obstruct or skew the planned water distribution pattern of fire sprinkler. In addition to creating a possible delaying or accelerating the activation of the sprinkler of fire detection system. Consult with a fire protection engineer for guidance.
4. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

### 1.6 DELIVERY, STORAGE, AND HANDLING

1. Store ceiling components in a dry interior location in their cartons prior to installation to avoid damage. Store cartons in a flat, horizontal position. The protectors between the panels should not be removed until installation.
2. Do not store in unconditioned spaces with humidity greater than 55 percent or lower than 25percent relative humidity and temperatures lower than 50 degrees F or greater than 158 degrees F. Panels must not be exposed to extreme temperatures, for example, close to a heating source or near a window with direct sunlight.
3. Handle ceiling units carefully to avoid chipped edges or damage to units in any way.

### 1.7 PROJECT CONDITIONS

1. Space Enclosure:
	1. HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

### 1.8 WARRANTY

1. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period.
2. Warranty Period:
	1. Acoustical panels and Suspension: One (1) year from date of substantial completion
3. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

### 1.9 SUSTAINABLE MATERIALS

1. Health Product Declaration. The end use product has a published, complete Health Product Declaration with disclosure at a minimum of 1000ppm of known hazards in compliance with the Health Product Declaration Open Standard.
2. Declare Label. The end use product has a published Declare label by the International Living Future Institute with disclosure of 100 ppm with a designation of Red List Free or Compliant (less than 1% proprietary ingredients).
3. Low Emitting products with VOC emissions data. Preference will also be given to manufacturers that can provide emissions data showing their products meet CDHP Standard Method v1.2 (Section 01350).
4. Products meeting LEED V4 requirements.

### 1.10 MAINTENANCE

1. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
	1. Ceiling Units: Furnish quality of full-size units equal to 2.0 percent of amount installed.
	2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 1.0 percent of amount installed.

*Attention Design Professional please edit Part 2 based on your project needs. Select product attributes and Acceptable product item(s) that fit with the requirements for your project. Please refer to the Armstrong website (*[*Click here to link to the Armstrong Ceilings website*](https://www.armstrongceilings.com/commercial/en-us/)*) for additional Ceiling product, Suspension systems, Perimeter trim options and accessories. The related guide specification for these items is available on the website.*

### PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

1. Basis of Design FELTWORKS® Blades - VarAffix™ Acoustical Panels:
	1. Armstrong World Industries, Inc.
2. Suspension Systems:
	1. Armstrong World Industries, Inc.

### 2.2.0 CEILING UNITS

1. Ceiling Panels Type AP-1:
	1. Surface Texture: Soft
	2. Composition: Non-woven layered and formed Polyester felt (PET) fiber
	3. Finish(s):
* Iron (FIR)
* Graphite (FGH)
* Cloud (FCD)
* Fog (FOG)
* Frost (FFS)
* Ecru (FEC)
* Bedrock (FBR)
* Nickel (FNK)
* Steel (FST)
* Sand (FSD)
* Coconut (FCT)
* Peat (FPT)
	1. Edge Profile: Square
	2. Light Reflectance (LR) Frost (FFS) Panel: ASTM E 1477; 0.79
	3. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label, VOC Emissions Test (CDPH Standard Method V1.2)
	4. Weights:

Pounds Per Linear Foot Based on Blade Depth:

* 6-inch (Nominal): 0.31 lbs.
* 8-inch (Nominal): 0.36 lbs.
* 10-inch (Nominal): 0.42 lbs.
* 12-inch (Nominal): 0.51 lbs.
	1. Panel Thickness: 3/8 inch

Panel Length Size(s): With 1" reveal panel to panel @ length

* 48-inch (Nominal): 47-inch (Actual)
* 72-inch (Nominal): 71-inch (Actual)
* 96-inch (Nominal): 95-inch (Actual)
* 120-inch (Nominal): 119-inch (Actual)

Panel Depth Size(s):

* 6-inch (Nominal): 6-inch (Actual)
* 8-inch (Nominal): 7.5-inch (Actual)
* 10-inch (Nominal): 9.375-inch (Actual)
* 12-inch (Nominal): 12-inch (Actual)

Sizes (Select appropriate panel size):

**4ft Lengths:**

* + - 1. 6370RCE0004\_ \_ \_ 6 x 48 x 3/8" Rectangle Blade - 6" D, 4' L, PC12 per carton
			2. 6370RCE0009\_ \_ \_ 8 x 48 x 3/8" Rectangle Blade - 8" D, 4' L, PC12 per carton
			3. 6370RCE0013\_ \_ \_ 10 x 48 x 3/8" Rectangle Blade - 10" D, 4' L, PC12 per carton
			4. 6370RCE0017\_ \_ \_ 12 x 48 x 3/8" Rectangle Blade - 12" D, 4' L, PC12 per carton

**6ft Lengths:**

* + - 1. 6370RCE0007\_ \_ \_ 6 x 72 x 3/8" Rectangle Blade - 6" D, 6' L, PC12 per carton
			2. 6370RCE0010\_ \_ \_ 8 x 72 x 3/8" Rectangle Blade - 8" D, 6' L, PC12 per carton
			3. 6370RCE0014\_ \_ \_ 10 x 72 x 3/8" Rectangle Blade - 10" D, 6' L, PC12 per carton
			4. 6370RCE0018\_ \_ \_ 12 x 72 x 3/8" Rectangle Blade - 12" D, 6' L, PC12 per carton

**8ft Lengths:**

* + - 1. 6370RCE0001\_ \_ \_ 6 x 96 x 3/8" Rectangle Blade - 6" D, 8' L, PC12 per carton
			2. 6370RCE0011\_ \_ \_ 8 x 96 x 3/8" Rectangle Blade - 8" D, 8' L, PC12 per carton
			3. 6370RCE0015\_ \_ \_ 10 x 96 x 3/8" Rectangle Blade - 10" D, 8' L, PC12 per carton
			4. 6370RCE0019\_ \_ \_ 12 x 96 x 3/8" Rectangle Blade - 12" D, 8' L, PC12 per carton

**10ft Lengths:**

* + - 1. 6370RCE0008\_ \_ \_ 6 x 120 x 3/8" Rectangle Blade - 6" D, 10' L, PC12 per carton
			2. 6370RCE0012\_ \_ \_ 8 x 120 x 3/8" Rectangle Blade - 8" D, 10' L, PC12 per carton
			3. 6370RCE0016\_ \_ \_ 10 x 120 x 3/8" Rectangle Blade - 10" D, 10' L, PC12 per carton
			4. 6370RCE0020\_ \_ \_ 12 x 120 x 3/8" Rectangle Blade - 12" D, 10' L, PC12 per carton
	1. Acoustical Performance Infill Options:
		+ 1. 2820BK - Calla® Square Lay-in panel - NRC 0.85, CAC 35
			2. 1318 - BackStage Noir - NRC 0.75, CAC 30
	2. Acoustical Performance is tested per ASTM C423 and mounted in accordance with ASTM E795. Spacing of blades and blade depth will impact acoustical performance.

**Acoustical Information**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PanelDepth** | **6**" **O.C.** | **12**" **O.C.** | **18**" **O.C.** | **24**" **O.C.** |
| 6” | 0.55 | 0.40 | 0.30 | 0.25 |
| 8” | 0.65 | 0.50 | 0.35 | 0.30 |
| 10” | 0.75 | 0.55 | 0.45 | 0.40 |
| 12” | 0.85 | 0.65 | 0.55 | 0.45 |

* 1. Flame Spread: Class A
	2. Dimensional Stability: HumiGuard Plus
	3. Acceptable Product: FELTWORKS® Blades - VarAffix™ Acoustical Panels as manufactured by Armstrong World Industries.

\*Spacing of blades will impact acoustical performance. For more information regarding the FELTWORKS product line, contact *Armstrong Sales Representative Name here, contact number: 123-345-4567, email* here@armstrongceilings.com

**Please use ordering format found on our data page:**



1. Accessories:
	* 1. 6371MF - Feltworks Blades VarAffix Field-Cut Connector Kit (10 connectors & 20 screws/kit)

### 2.2.1 SUSPENSION SYSTEMS

1. Acceptable Product: Listed Below as manufactured by Armstrong World Industries, Inc. Items are available in custom colors; contact ASQuote@armstrongceilings.com.
	1. 7300BL – Prelude® XL® 12' ID Main Beam - Black (20 pieces/carton)
	2. 7301BL – Prelude® XL® 12' HD Main Beam - Black (20 pieces/carton)
	3. XL7341BL – Prelude® XL® 4' Cross Tee - Black (60 pieces/carton)
2. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least times-three design load, but not less than 12 gauge.
3. Accessories/Edge Moldings and Perimeter Trim:
	1. 5450 - Cable Suspension Kit (2 Connection Points)
	2. 7121 - Angled Hanging Adapter (60° maximum angle) – Extends from the end of Deck Hanging Kit (5450)
	3. 625530 - Extended Hanging Cables (30' Aircraft Cable)
	4. 6701\_ \_ \_ - Threaded Grid Clip (80/kit) - Mill Finish (SS), Black (BL), White (WH)
	5. AX\_STR\_ \_ \_ - Axiom Vector Straight Trim – Finish based on design
	6. AX\_Cur\_ \_ \_ - Axiom Vector Curved Trim – Finish based on design
	7. 7239 - Adjustable Trim Clip (50/kit)

### PART 3 - EXECUTION

### 3.1 EXAMINATION

1. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.
2. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

### 3.2 PREPARATION

1. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

### 3.3 INSTALLATION

1. Install suspension system and blades in compliance with the approval of the authorities having jurisdiction, and in accordance with the manufacturer’s FELTWORKS Blades Installation Instructions.

### 3.4 ADJUSTING AND CLEANING

1. Replace damaged and broken panels.
2. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer’s instructions for cleaning and touch up of minor finish damage.

### END OF SECTION