SECTION 23 34 00 – FRP CENTRIFUGAL FAN

1. GENERAL
	* + 1. SUMMARY
				1. Section includes single-width, single-inlet (SWSI) Fiberglass reinforced plastic (FRP) centrifugal fan.
			2. REFERENCE STANDARDS
				1. American Bearing Manufacturers Association (ABMA): [www.americanbearings.org](http://www.americanbearings.org/):

ABMA 9 – Load Ratings and Fatigue Life for Ball Bearings

* + - * 1. Air Movement and Control Association International, Inc. (AMCA): [www.amca.org](http://www.amca.org):

AMCA Standard 204 - Balance Quality and Vibration Levels for Fans

AMCA Standard 210 / ASHRAE 51 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating

AMCA Standard 300 - Reverberant Room Method for Sound Testing of Fans

* + - * 1. National Electrical Manufacturers Association (NEMA): [www.nema.org](http://www.nema.org)

NEMA MG 1 – Motors and Generators

* + - * 1. National Fire Protection Association (NFPA): [www.nfpa.org](http://www.nfpa.org):

NFPA 70 - National Electric Code

* + - * 1. ASTM International (ASTM): [www.astm.org](http://www.astm.org)

1. D4167 – Standard Specification for Fiber-Reinforced Plastic Fans and Blowers

2. E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

* + - 1. ACTION SUBMITTALS
				1. Product Data: Include the following:

Rated capacities and operating characteristics.

Fan Performance Data: Fan performance curves with flow, static pressure and horsepower.

Fan sound power level data at design operating point

Motor ratings and electrical characteristics.

Furnished specialty components.

Specified accessories.

Specifier: Specify document names if necessary

* + - 1. INFORMATIONAL SUBMITTALS
				1. Quality control reports
			2. FIELD CONDITIONS
				1. Handling and Storage: Handle and store fan units in accordance with manufacturer's published instructions. Examine units upon delivery for damage. Store units protected from weather.
			3. WARRANTY
				1. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to furnish replacement components for fan units that demonstrate defects in workmanship or materials under normal use within warranty period specified.

Warranty Period: 12 months from startup or 24 months from shipment by manufacturer, whichever first occurs.

1. PRODUCTS
	* + 1. MANUFACTURER
				1. Manufacturer: TEXEL-SEIKOW U.S.A., Inc., Houston TX ; (713) 683-1505

E-mail: info@texelseikowusa.com ; website: texelseikow.com

* + - 1. PERFORMANCE REQUIREMENTS

Specifier: Select elevation type in following sub paragraphs

* + - * 1. Fan Performance Ratings: [Project site elevation- based] [Sea level-based].
			1. CENTRIFUGAL BACKWARD CURVED FANS
				1. Description: FRP Centrifugal Backward Inclined Fan: Single-width, single-inlet, centrifugal fan

Basis of Design Product: **TEXEL-SEIKOW U.S.A., Inc. FTB Model**

* + - * 1. Fan Capacities: Refer to drawing schedule.

Specifier: Select resin type in following sub paragraphs as required by Drawing Schedule

* + - * 1. Fan Wheel: [Vinyl ester resin][Brominated vinyl ester resin with an ATEM E 84 Class I rating]

Materials of Construction: Manufacturer's standard, based on wheel size and pressure class.

Statically and dynamically balanced wheel.

Minimum Balance Quality Grade: G6.3, in accordance with AMCA Standard 204.

Specifier: Retain paragraph below for spark resistance construction..

Provide graphite coating for the wheel for spark resistance construction.

* + - * 1. Bearings

1. Oil lubricated bath bearing type

2. Oil level indicator installed on the side of the oil bath housing

3. Minimum Average Bearing Life: ABMA L-10 = 100,000 hours at the maximum fan operating speed.

Specifier: Select resin type in following sub paragraphs as required by Drawing Schedule

 E. Housing: [Vinyl ester resin][Brominated vinyl ester resin with an ASTM E84 Class I rating]

Specifier: Retain and select the following paragraphs as required by Drawing Schedule

Access Door - [Raised Bolted Round][6 inches]

Drain: [3/4 inch NPT with plug][PVC Flanged Drain] [FRP Flanged Drain]

Provide [Punched] [Unpunched] flanges for making connections to ductwork.

Specifier: Retain paragraph below for spark resistance construction..

Provide graphite coating for inside of the housing for spark resistance construction.

Specifier: Arrangement 1, Belt driven type is standard for FTB model. Consult TEXEL-SEIKOW U.S.A., Inc. for other drive options.

* + - * 1. Drives:

Type: Belt driven

Arrangement 1

Drive Components: V-belt drive, rated for minimum 150 percent of motor nameplate horsepower, with machined, cast-iron pulleys, and heat resistant, oil resistant, static-free V-belts.

Belt Guard: FRP, ventilated, OSHA compliant with a quick access port

Shaft Guard: FRP, OSHA compliant

* + - * 1. Motors: Comply with NEMA MG-1 for designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 section "Common Motor Requirements for HVAC Equipment."

Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

Motor Speed: Based upon performance requirements and application.

Specifier: Select motor electrical data in following subparagraphs, or show this data on the drawing fan schedule.

Electrical Data:

Voltage: [115] [208] [230] [460] [575] [\_\_\_\_\_] V; [1] [3] phase; 60 Hz.

Specifier: Change motor enclosure when needed.

Enclosure Type: Totally Enclosed Fan Cooled (TEFC)

Provide motors that comply with the Energy Independence and Security Act of 2007 (EISA).

For motors controlled by VFDs, retain following subparagraph.

When required, provide premium efficiency motor, suitable for inverter duty, for motors controlled by Variable Frequency Drive (VFD).

Specifier: Retain paragraph and subparagraph below when isolation is required, and coordinate options with project design.

* + - * 1. Vibration Isolation:

Provide [Rubber]][Spring] vibration isolators in accordance with fan manufacturer's requirements, and Division 23, Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

Isolation Type Base: [Rubber isolation base]][Spring isolation base].

Specifier: Select vibration isolation type in the following paragraphs.

Provide [Rubber isolation base]][Spring isolation base].

* + - * 1. Interior Access:

Design fan to allow for wheel removal through fan inlet opening.

Specifier: Paragraph 2 below represents standard construction features for FTB202, 251, 252 models

Split Housing: Provide two mating sections that lift apart to allow total access to interior of fan wheel. Include bolts, hardware, and full gasketing.

* + - * 1. Skid
1. Provide epoxy coated carbon steel skid for corrosion resistance against outside or severe environment use.

Specifier: Accessories listed below are optional items for FTB model. Consult TEXEL-SEIKOW US for recommended options.

* + - * 1. Accessories:

Dampers: FRP Round or rectangular dampers

Companion flanges: PVC, with pre-punched bolt holes

Flexible joints: Soft PVC tube and PVC flanges with pre-punched bolt holes.

Silencer: FRP silencer with flanged connections

All vinyl ester resin

Graphite coating: Air stream surfaces are coated with graphite coating with grounding cables.

Synthetic veil: Polyethylene texture mat is used to be resistant against severe chemicals that penetrate glass texture in the FRP.

ASTM D4167-97 construction

High temperature construction packages for to 250 deg. F

Shaft seal: [Stuffing box][Packing seal][Mechanical seal][Water seal]

* + - 1. SOURCE QUALITY CONTROL
				1. Factory Run Test: Statically and dynamically balance each wheel in accordance with AMCA Standard 204 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. Test run assembled fan units prior to shipment at specified operating speed or maximum RPM allowed.
			2. EXAMINATION
				1. Examine areas to receive fans. Notify Engineer regarding conditions that may adversely affect installation, operation, or maintenance of fans. Proceed with installation once conditions are in accordance with manufacturer's published instructions.
			3. PROTECTION
				1. Protect adjacent construction and finished surfaces during installation and testing.
				2. Except for operational testing, do not operate fan during construction.
			4. INSTALLATION
				1. Install fans in accordance with Contract documents and manufacturer's published instructions.
				2. Install fan units with adequate clearances for service and maintenance.
				3. Electrical Connections: Connect wiring in accordance with NFPA 70 and Division 26 section "Low-Voltage Electrical Power Conductors and Cables."

Ground and bond equipment according to Division 26 section "Grounding and Bonding for Electrical Systems."

* + - * 1. Equipment Identification: Label units according to Division 23 section "Identification for HVAC Piping and Equipment."
			1. FIELD QUALITY CONTROL

Specifier: Select option in paragraph below to define the party responsible for final tests and inspections to be performed.

* + - * 1. [Owner will retain] [Contractor shall retain] qualified testing agency to perform field tests and inspections.

Retain first paragraph below to describe tests and inspections to be performed.

* + - * 1. Tests and Inspections:

Verify that unit is secured to supports, and that duct and electrical connections are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

Verify that cleaning and adjusting are complete.

Specifier: Retain option in following paragraph for belt driven units. Otherwise, delete option.

[Disconnect fan belt drive from motor.] Verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.

Verify that manual and automatic volume control, and fire and smoke dampers in connected ductwork systems are in fully open position.

Disable automatic temperature-control actuators, energize motor, adjust fan to indicated rpm, and measure and record motor voltage and amperage.

Shut unit down and reconnect automatic temperature-control actuators.

Remove and replace malfunctioning units and retest as specified above.

* + - * 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
				2. Submit test and inspection reports.
			1. ADJUSTING AND CLEANING
				1. Adjust, clean, and maintain installed fan units in accordance with manufacturer's published instructions.

END OF SECTION