



## SPECIFYING FRP FAN EQUIPMENT GFE FANS

### GENERAL

The fans shall be size \_\_\_\_\_ single-width, single-inlet as designed and manufactured by The New York Blower Company. The fan shall be constructed such that all surfaces in contact with the corrosive gas stream are to be made of corrosion-resistant FRP. All nuts, bolts and fasteners in contact with the gas stream shall be type 316 SST and encapsulated in FRP. Fans shall be AMCA Arrangement 1, 8, 9, 9F, or 10. AMCA Arrangement 4, which places the motor shaft in the corrosive gas stream, is unacceptable.

### PERFORMANCE

Fan ratings shall be based on tests made in accordance with AMCA Standard 210 and licensed to bear the AMCA Certified Ratings Seal for Air Performance. Fans not licensed to bear the AMCA Seal for performance shall be tested, at supplier's expense, in an accredited AMCA laboratory. (Option: Only AMCA-certified fans will be accepted.) Fans shall have a sharply rising pressure characteristic extending throughout the operating range to assure quiet and stable operation. Fan brake horsepower shall be equal to or less than \_\_\_\_\_ BHP at \_\_\_\_\_ inches static pressure and \_\_\_\_\_ CFM at \_\_\_\_\_ density.

### SOUND

Fan manufacturers shall provide sound power level ratings for fans tested and rated in accordance with AMCA Standards 300 and 301. Tests shall be performed in an accredited AMCA laboratory. Sound power ratings shall be in decibels (reference 10-12 watts) in eight octave bands. Sound power levels will be corrected for installation by the specifying engineer...dBA levels only are not acceptable.

### BEARINGS

Bearings are to be grease lubricated, precision anti-friction ball or spherical roller, self-aligning, pillow block design. Bearings shall be designed for a minimum L-10 life of 30,000 hours (150,000 hours L-50 life) when rated at the fan's maximum cataloged operating speed. Fan bearings shall be visible and accessible for inspection and maintenance. Bearings enclosed within the fan housing where they can be exposed to the corrosive gas stream are not acceptable.

### CORROSION PROTECTION OF STEEL/FINISH COATING

All steel fan surfaces are to be thoroughly cleaned prior to painting using a combination of washing and hand/power tool cleaning per SSPC-SP1, SSPC-SP2 and SSPC-SP3 standards. (Option: all steel fan surfaces are to receive as a minimum, cleaning per SSPC-SP6 std.) After cleaning, surfaces of bolted metal components shall be coated and allowed to dry prior to final assembly. After assembly, all fan exterior surfaces are to receive one coat of epoxy enamel finish to a thickness of 2-3 mils d.f.t. All fasteners external to the gas stream shall be plated for extra corrosion protection.

### CONSTRUCTION

Fan shall be constructed in accordance with the ASTM D-4167 standard specification for fiber-reinforced plastic fans and blowers to ensure structural integrity. All parts exposed to the gas stream shall be constructed of, or encapsulated in, an FRP laminate capable of resisting continuous airstream temperatures of 250° F. All resins shall be clear to allow detection of subsurface imperfections. Use of pigments, gel coats, inhibitors and additives which may disguise flaws in the laminate are prohibited.

Other minimum construction requirements shall consist of the following:

- I. **Housing** - Fan housing shall be constructed of a fire-retardant vinyl ester resin with an ASTM E84 Class I rating. Housing laminate construction shall conform to ASTM Standard C-582.  
Airstream surfaces shall be smooth to minimize resistance and prevent build-up of airborne contaminants. Fan shall be furnished with flanged outlet.  
Shaft hole openings shall be fitted with a Teflon® closure having a maximum clearance of 1/32" to minimize leakage. (Option: fan shall be furnished with a lubricatable, double-lip, Teflon or Viton® shaft seal.) Inlet assembly shall be bolted to permit wheel removal.
- II. **Wheel** - Wheel shall be of backwardly-inclined, non-overloading design for increased efficiency. Wheel shall be fabricated of a fire-retardant vinyl ester resin with an ASTM E84 Class I rating. Wheel hub shall be permanently bonded to the shaft and completely encapsulated in FRP to insure corrosion-resistant integrity. Steel wheels coated with FRP, or wheels with taper-lock hubs, are not acceptable.
- III. **Shaft** - Shaft shall be ASTM A-108 steel, grade 1040/1045 with an FRP sleeve fixed securely and bonded to the wheel backplate. The sleeve shall extend out through the housing shaft hole for corrosion protection. (Option: Shaft or shaft sleeve shall be 316 SST or Hastelloy® C-276.) The shaft first critical speed shall be at least 125% of the fan's maximum operating speed. Shaft shall be countersunk for tachometer readings.

### BALANCE AND RUN TEST

The wheel and shaft shall be dynamically balanced as an assembly, and the fan will be balanced in accordance with the limits set forth in AMCA 204, Section 6, Table 6-3 for Industrial Process and Power Generation Equipment level BV-3 (.15 in/sec. filter-in at both bearings in the horizontal and vertical planes).

### WARRANTY

Fan manufacturer shall warrant that all fan components shall be free from defects in materials and workmanship for a period of one (1) year after shipment from its plant.

### ACCESSORIES

Accessories shall be provided as called for in the plans and specifications. Required accessories include:

- Cleanout Door (sizes 18-60 only)
- All-Vinyl Ester Airstream Plug
- Heavy Duty Slide Rails
- Inspection Port
- Flanged Inlet
- Flange Drilling
- Inlet Box (Sizes 18 to 54)
- Shaft Seal: Viton, Teflon
- Graphite Impregnation
- Surface Veil
- Parallel Blade Outlet Damper
- V-Belt Drive: Adjustable, Constant
- Narrow-Width Construction
- Threaded Drain, w/PVC Plug
- Positive Screw Adj. (Arr.10)
- Weather Cover (Arr.10)
- Safety Equipment: Belt Guard, Shaft Guard, Coupling Guard
- Unitary Base: R-I-S Isolators, Spring Isolators
- Isolation Rails (Arr.10): R-I-S, Spring

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