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**Twin City Fan & Blower Guide Specification
Tubular Propeller Fans, Stationary Mount: Model TCSM**

**Twin City Fan & Blower Model TCSM Series Stationary Mancoolers** provide a quality constructed axial flow fan mounted on a fixed bracket base. Model TCSM is available in direct drive configurations.

The Twin City Fan & Blower stationery mancooler can provide spot cooling or area ventilation while being mounted in an out-of-the-way location. Designed for either wall, column, ceiling or floor mounting, the stationary mancooler can be adjusted for airflow in any direction. The stationary mancooler is provided with a predrilled base plate for mounting to whatever structure is desired. Both the inlet and the outlet are provided with screens as standard, fabricated to meet OSHA safety requirements.

**Application**

The TCSM tubular propeller fan is designed as a stationary mancooler, providing a quality constructed axial flow fan mounted on a base plate.

Sizes (propeller diameters): 16 to 48 inches (406 mm to 1,219 mm)

Airflow: 3,000 to 41,200 CFM (5,097 to 69,998 m3/hour)

Twin City Fan & Blower (TCF) is an industry leading designer and manufacturer of high quality commercial and industrial fans and is a division of Twin City Fan Companies, LTCSM. Our extensive product line includes centrifugal fans and blowers, axial fans, and power roof ventilators. For the commercial market, TCF supplies ventilation fans for retail and office buildings, restaurants, schools, hospitals, and government buildings. TCF’s industrial fans are used in a wide variety of process applications for numerous industries including Petrochemical, Nuclear, Cement, Steel, and Air Pollution Control. Special materials, construction, coatings, and accessories are available to fit any application requirements.

TCF has completed thousands of successful installations across the globe and has a proven track record for tackling the most technically complex applications within the fan industry. TCF is also known for its technical design capabilities, comprehensive testing services, and responsive sales team. Due to the company’s extensive expertise and long-standing reputation for proven quality, TCF products continue to be specified around the globe.

TCF occupies over 1,000,000 sq. ft. of manufacturing space across ten facilities in the U.S, with expanded manufacturing and service operations located in South America, Europe, India, China, and Singapore. Headquarters are located in Minneapolis, Minnesota, which houses the management, sales and marketing, accounting, human resources, material management, engineering personnel, as well as a state-of-the-art AMCA accredited testing lab.

We recommend you consult with your Twin City Fan & Blower Sales Representative, who can be contacted through: Twin City Fan & Blower, Minneapolis MN; (763) 551-7600; email: tcf\_sales@tcf.com; [www.tcf.com](http://www.tcf.com).

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SECTION 23 34 23.08 – PROPELLER FANS

1. GENERAL
	* + 1. SUMMARY
				1. Section includes axial direct drive mancooler fans.
			2. REFERENCE STANDARDS
				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. 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.

Sound Performance Data: Fan sound power levels in eight octave bands and, A-weighted overall sound power level or sone values.

Motor ratings and electrical characteristics.

Furnished specialty components.

Specified accessories.

Dimensioned standard drawings indicating dimensions, weights, and attachments to other work.

Specifier: If Contractor will be required to provide engineering drawings and calculations for vibration, seismic, or high wind design, insert requirements here.

* + - 1. INFORMATIONAL SUBMITTALS
				1. Source quality-control reports.
				2. Field quality-control reports.
				3. ISO-9001 certificate.
			2. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: Include routine maintenance, adjustment requirements, safety information, and troubleshooting guide.
			3. QUALITY ASSURANCE
				1. Manufacturer Qualifications: Approved ISO 9001-compliant manufacturer listed in this Section with minimum 10 years' experience in manufacture of similar products in successful use in similar applications, and with an ASME NQA-1 compliant Program.

Specifier: Retain paragraph below if Owner allows substitutions but requires strict control over qualifying of substitutions.

Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

Product data, including certified independent test data indicating compliance with requirements.

Project references: Minimum of 5 installations not less than 5 years old, with Owner contact information.

Sample warranty.

Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

Approved manufacturers must meet separate requirements of Submittals Article.

* + - * 1. AMCA Compliance:

Provide fan types tested in accordance with AMCA Standard 210 (air performance) and AMCA Standard 300 (sound performance) in an AMCA-accredited laboratory.

* + - 1. 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.
			2. WARRANTY

Specifier: Consult TCF for available special Project-specific warranties.

* + - * 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 18 months from shipment by manufacturer, whichever first occurs.

1. PRODUCTS
	* + 1. MANUFACTURER
				1. Basis-of-Design Manufacturer: Provide fan units manufactured by Twin City Fan & Blower, Minneapolis MN; (763) 551-7600; email: tcf\_sales@tcf.com; website: [www.tcf.com](http://www.tcf.com).
				2. Source Limitations: Obtain stationary mancooler fans from a single manufacturer.
			2. PERFORMANCE REQUIREMENTS
				1. Fan Performance Ratings: [Project site elevation- based] [Sea level elevation-based].
				2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70.
			3. MANCOOLER FANS
				1. Direct-driven airfoil axial fans, configured for horizontal or vertical flow of relatively clean air for ventilating applications.

Basis of Design Product: **Twin City Fan & Blower, Model TCSM**.

Permanently attach nameplate displaying serial number and unit information.

* + - * 1. Fan Capacities, Characteristics, and Configuration: Refer to Drawing schedule.
				2. Fan Propeller: Single piece cast aluminum blades and hub.

Hub Attachment to Motor Shaft: Taper-lock bushing.

Machine propeller to proper dimensions.

Statically and dynamically balance propeller when fabricated, and again after fan unit has been assembled.

* + - * 1. Casing: Formed ASTM A-569 low carbon hot rolled steel with continuously welded seams.
				2. 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."

Manufactured in accordance with current applicable standards of IEEE and NEMA.

Foot-mounted, NEMA standard, totally enclosed fan cooled (TEFC), rated for continuous duty with class “B” insulation.

Provide ball bearings with external grease fittings.

Specifier: Select motor electrical data in following subparagraphs, or show this data on the drawing fan schedule. Do not show the data in both places.

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: [1,800] [1,200] [900] rpm.

Electrical Data:

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

Enclosure Type: Totally Enclosed Fan Cooled (TEFC).

* + - * 1. Externally Mounted Conduit Box.
				2. Stationary Base: Provide mounting bracket suitable for attachment in vertical or horizontal direction.

Provide swivel base that allows 360 degree rotation.

* + - * 1. Lifting Lug: Provide lifting lug suitable for crane hook or lifting straps on top of fan.
				2. Finishes:

Do not apply coatings to aluminum components/

After fabrication, clean and chemically pretreat ferrous metal parts by phosphatization.

Apply two coats of following finish:

Specifier: The first paragraph below is manufacturer's standard finish. Those that follow are optional finishes. Select finish that is required.

If fans specified for the project have different finishes, include the finish for each fan on the Drawings and delete here.

Air dry enamel.

Carbocoat 30

Hot Dip Galvanizing.

Plasite 4310 Vinyl Ester

Plasite 7122L Air Dry Phenolic

Heresite VR506 Air Dry Phenolic.

Dupont ASA, 70 Gray Polyester.

* + - * 1. Accessories:

Specifier: Accessories listed in subparagraphs below are optional TCF features for this unit. Consult TCF representative for recommended options based upon Project requirements.

Provide unfused disconnect switch, NEMA 3R selected in accordance with Division 26 section "Enclosed Switches."

Factory mount and wire disconnect switch.

[Inlet] [Outlet] Guards: Removable, [welded] [mesh] wire screens.

* + - 1. SOURCE QUALITY CONTROL
				1. Factory Run Test: Test run assembled fan units prior to shipment at specified operating speed or maximum RPM allowed. Statically and dynamically balance each wheel in accordance with AMCA 204 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. Obtain balance readings by electronic equipment in the axial, vertical, and horizontal directions on each set of bearings.

Submit report of factory run test.

1. EXECUTION
	* + 1. 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.
			2. PROTECTION
				1. Protect adjacent construction and finished surfaces during installation and testing.
				2. Except for operational testing, do not operate fan during construction.
			3. 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: 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 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.

Verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation.

Remove and replace malfunctioning units and retest as specified above.

* + - * 1. 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