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**THE FOLLOWING PARAGRAPH NUMBERS REFER TO API-673, FIRST EDITION, JANUARY 1982,
WHICH IS A PART OF THIS PRACTICE**

SECTION 1 - GENERAL

- I 1.1 SCOPE
- a. This practice covers the design, accessories, inspection, testing, and performance of general purpose fans - including their associated driver, power transmission and auxiliaries - which are designed for operation under the following conditions:
 1. A developed discharge pressure of less than 5 psi (34 kPa) from atmospheric pressure.
 2. Uninterrupted fan operation up to 8000 hours, or for services where the operating fan has an installed spare.
 - b. All sections in this practice are additions to those of **API-673** unless specifically noted as exceptions. Paragraph numbers in this practice which do not appear in **API-673** are new paragraphs.
 - c. **An asterisk (*)** indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.
Note: A bullet (•) is shown in **API-673** indicating that a Purchaser's decision is required.
 - d. **Vendor qualification.** Fans, including guide vanes and dampers, shall be supplied by vendors qualified by experience in manufacturing the unit proposed. To qualify, the vendor must have manufactured, at the proposed point of manufacture, at least two units of comparable power, speed, and service conditions which have been operating satisfactorily for at least one year.
- I 1.5 REFERENCED PUBLICATIONS
- a. **Table 1** lists the practices and standard which shall be used with this practice.
 - * b. **Table 2** lists the practices, code and standards which shall be used with this practice as specified by the Purchaser.

TABLE 1

PRACTICES			
IP 2-1-1	Plant Noise Design Criteria	IP 10-14-1	Lube and Seal Oil Systems for Machinery
IP 10-11-1	Sizing of Drivers and Transmissions for Compressors, Fans, and Pumps	IP 18-12-1	Positive Material Identification
		IP 20-1-1	Inspection of Equipment and Materials
STANDARD			
API Standard			
673	Special-Purpose Centrifugal Fans for General Refinery Service		

TABLE 2

PRACTICES			
IP 3-3-12	Oil Mist Lubrication Systems	IP 16-9-1	Low Voltage A-C Motors Up to 200 HP (150 kW)
IP 10-7-1	General Purpose Steam Turbines	IP 16-9-2	AC Motors: Medium Voltage and Low Voltage
IP 10-10-2	General Purpose Gear Units		Over 200 HP (150 kW)
CODE AND STANDARDS			
ASME Code		ASTM Standards (Cont)	
Section VIII	Pressure Vessels, Division 1	B 111 / B 111M	Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock
ASTM Standards		NACE	
A 193 / A 193M	Alloy-Steel and Stainless Steel Bolting	MR0175	Sulphide Stress Cracking Resistant Metallic Material for Oil Field Equipment
A 194 / A 194M	Carbon and Alloy Steel Nuts and Bolts for High-Pressure and High-Temperature Service	NEMA	
A 488 / A 488M	Steel Castings, Welding, Qualifications of Procedures and Personnel	SM23	Steam Turbines for Mechanical Drive Service

IP 10-13-2		General Purpose Centrifugal Fans	
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(This practice is appropriate for attachment to Inquiry or Purchase Document)

SECTION 2 - DESIGN

	2.1	GENERAL
R	* 2.1.1	(Exception) Fans, drivers, and auxiliaries shall be designed for at least 8000 hours of continuous service, except as otherwise specified.
O,R	* 2.1.3	Fans and auxiliaries shall be suitable for outdoor installation in the climatic zone specified .
C	2.1.4	(Exception) Bearing arrangement. Impeller overhung designs are acceptable.
E	2.1.15	Noise. Fan vendor shall submit noise emission data for the quoted machine per IP 2-1-1 .
	2.2	FAN HOUSING
M	2.2.2	Doors shall be provided for access to inlet guide vanes.
R	2.2.4	Internal bolting , if used within the fan housing, shall be self-locking .
O	2.3.2	(Exception) Drain connections shall be valved .
	2.7	CRITICAL SPEED AND BALANCE
O,R	2.7.10	The rotating elements shall be dynamically balanced .
O	2.7.12	(Exception) All fans shall be shop tested . The peak-to-peak amplitude of vibration (including run-out) in any plane, measured on the shaft adjacent to the bearing housing, shall not exceed 2.0 mils (50 µm) throughout the specified speed range.
	2.8	BEARINGS AND BEARING HOUSINGS
C	* 2.8.1	(Exception) Radial bearings shall be of the vendor's standard type.
C	2.8.2	(Exception) Thrust bearings shall be of the vendor's standard type.
C	2.8.3	(Exception) Antifriction bearing selection shall be based on the following ratings : a. DN factor less than 300,000. b. Minimum L-10 life factor of 25,000 hours in continuous operation at rated fan conditions, but not less than 16,000 hours at maximum axial and radial loads and rated speed. c. Load factor less than 2,700,000.
R	2.8.8	d. Material for cooling coils shall be per ASTM B 111 Alloy C44300, C44400, or C44500. Pipe connections inside the bearing housing are prohibited.
M	2.8.15	Shaft bearings shall be accessible without dismantling duct work or fan casing.
	2.9	LUBRICATION
R	* 2.9.1	Oil mist lubrication (antifriction bearings only). Fans and gears specified for oil mist lubrication shall comply with the following: a. An oil mist inlet connection, NPS 1/4 (8 mm) shall be provided in the top half of the bearing housing located so that oil mist will flow through antifriction bearings. Alternatively, where oil mist connections are between each housing shaft enclosure and the bearings, one vent central to the housing shall be supplied. b. A vent connection, NPS 1/4 (8 mm) shall be provided on the housing or end cover for each of the spaces between antifriction bearings and the housing shaft closures. c. Shielded, sealed, or double-row type antifriction bearings shall not be used. d. When pure oil mist is specified, oil rings or flingers (if any), constant level oilers, shall not be provided, and a mark indicating oil level is not required. When purge mist lubrication is specified, these items shall be provided and the oiler shall be piped so that it is maintained at the internal pressure of the bearing housing.
C	* 2.9.2	Where a pressurized lubrication system is required for the fan, its driver, or gear unit, the lube oil system shall be mounted within the confines of the main unit base area unless mounting on a console assembly base is specified.
R	2.9.3	As a minimum, instrumentation to be furnished for a fan or gear unit utilizing pressurized lubrication shall measure: a. Lube oil outlet temperature at each bearing b. Lube oil header pressure c. Lube oil filter pressure drop
	2.10	MATERIALS
	2.10.1	GENERAL
R	2.10.1.1	Fan housing and inlet box construction shall be of carbon steel unless otherwise specified.



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