ENGINEERING DATA SHEET

Additional standards in the form of data as accepted by the Air Moving & Conditioning Association, Inc. (AMCA) is included in this data sheet. Information contained herein is of importance in properly identifying fans as to spark resistant construction, proper class, and corrections for variation in temperature and altitude. These all have bearing on the correct and satisfactory choice of fan equipment, and should be a portion of your regular every-day working data.

1. FANS –– standard classification for spark resistant construction. Data Sheet No. AS-401-66. Please note the definition and explanation of differences in the three styles of spark resistant construction as outlined in this page. They are of particular importance in quoting fan equipment, and in properly interpreting specifications for specialized equipment which may be required. The type of fan specified should be clearly identified. Under type A, all parts of the fan in contact with the air are made of nonferrous material, which in our construction is usually of aluminum. Exterior supporting structure not in contact with the air in any way whatsoever may be of steel material.

Type B is the usual type of spark resistant fan required, in which the fan wheel and rubbing ring around the shaft are made of nonferrous material but the rest of the fan is constructed of steel.

Type C is occasionally specified and is the least expensive of the three. In this case a rubbing ring or plate is placed behind the fan wheel, and the fan intake or portion of it is made of nonferrous material so that as the steel impellor shifts from side to side as it may during years of operation it will not strike against another steel part and make a spark.

2. FANS –– operating limits for Classes I, II, and III. Data sheets No. AS-2408-69, sheets one through five. These clearly define the proper classifications of fan construction for various operating limits of static pressure and outlet velocity. Please note that the class limitation changes for different types and width of fans.

3. AIR DENSITY RATIOS –– at various altitudes and air temperatures Data Sheet No. AS-402-66. Since the data sheet AS-2408-69, 1 thru 5, defining limits of the various classes of fans is based upon standard air and sea level operation, it is evident that a correction factor must be applied when the fan is chosen to operate at an elevated temperature and/or altitude. This chart clearly indicates what that correction factor shall be. In all cases, the correction factor so found must be properly applied.

For instance, if an Airfoil double width fan is to operate at an outlet velocity of 3000 feet per minute and at a static pressure of 3 inches, it is normally a Class I fan. If however, this same fan under these same conditions is running at 200 degrees F, and at an altitude of 3000 feet, the correction factor of .72 divided into the static pressure of 3 inches will result in a new static pressure of 4.16 which places it well within the Class II construction. The fan for this application therefore should be a Class II fan, and not a Class I. Similar corrections are applied for other operating conditions.

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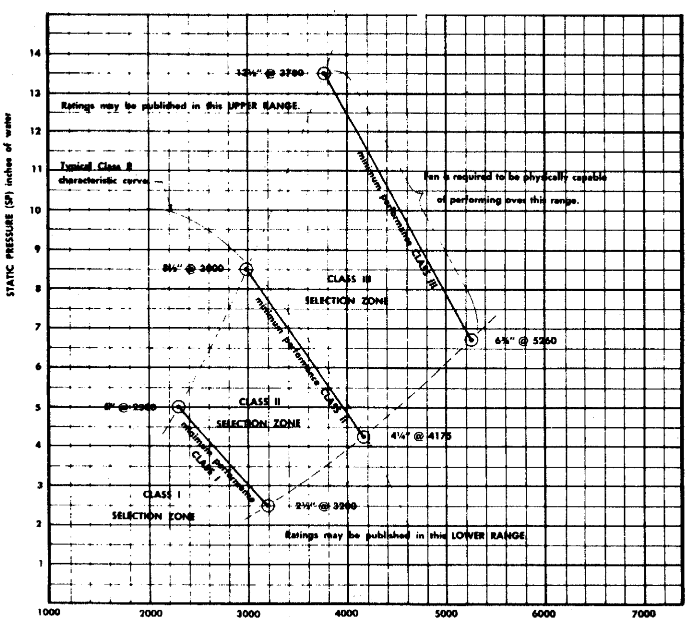
TYPE	CONSTRUCTION
A	All parts of the AMD in contact with the air or gas being handled shall be made of non-ferrous material.
B	The AMD shall have an entirely non-ferrous wheel or impeller and non-ferrous ring about the opening through which the shaft passes.
C	The AMD shall be so constructed that a shift of the wheel or impeller or shaft will not permit two ferrous parts of the AMD to rub or strike.

Notes: (1) Bearings shall not be placed in the air or gas stream.

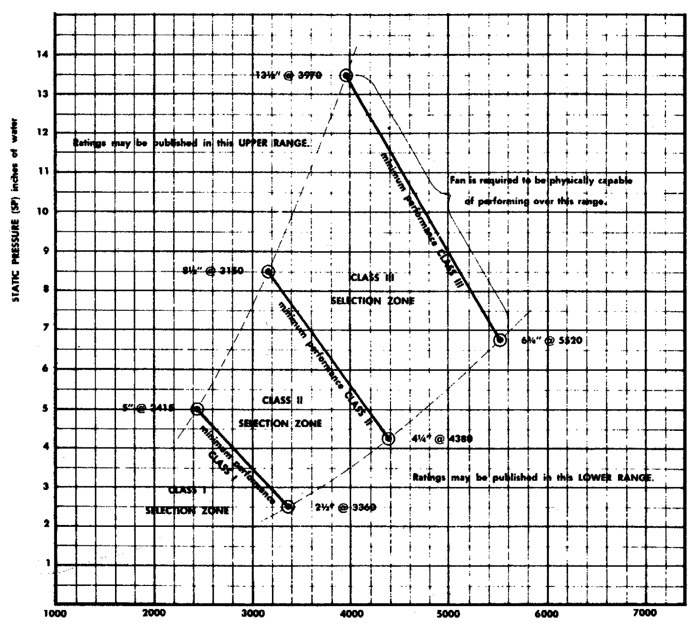
(2) The user shall electrically ground all AMD parts.

Adopted 9-7-60 / Revised 11-30-66	CLASSIFICATIONS FOR SPARK RESISTANT CONSTRUCTION	AMCA STANDARD 401-66



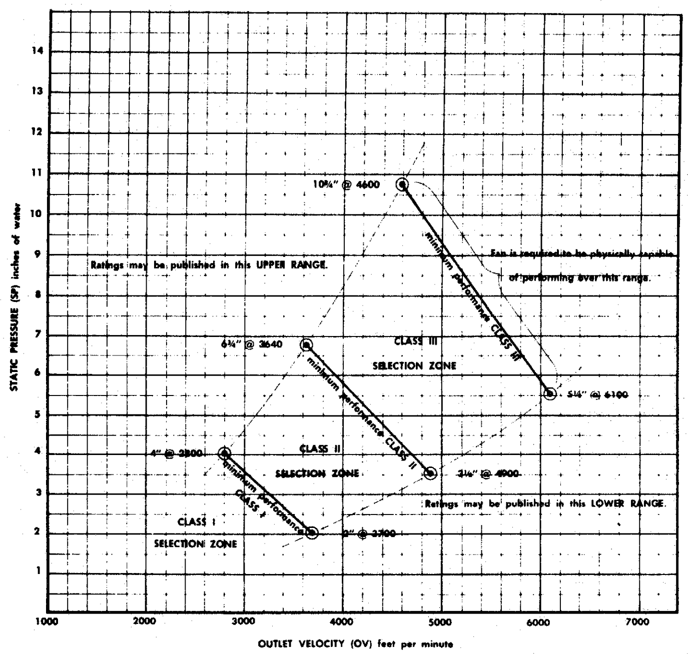
OPERATING LIMITS FOR SINGLE WIDTH CENTRIFUGAL FANS— Ventilating Airfoils & Backwardly Inclined.

AMCA STANDARD 2408-69 Sheet 1 of 5



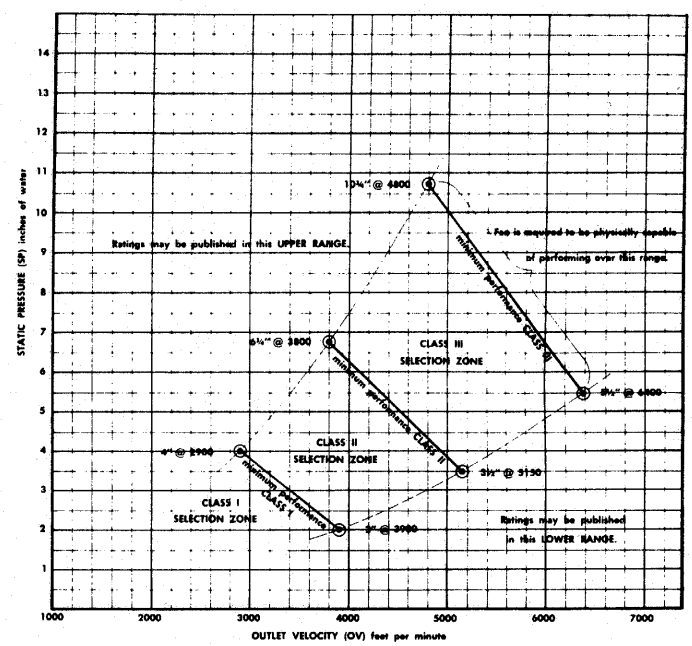
OPERATING LIMITS FOR DOUBLE WIDTH CENTRIFUGAL FANS— Ventilating Airfoils & Backwardly Inclined.

AMCA STANDARD 2408-69 Sheet 2 of 5



OPERATING LIMITS FOR SINGLE WIDTH CENTRIFUGAL FANS— Ventilating Forward Curved.

AMCA STANDARD
2408-69
Sheet 3 of 5



OPERATING LIMITS FOR DOUBLE WIDTH CENTRIFUGAL FANS— Ventilating Forward Curved.

AMCA STANDARD
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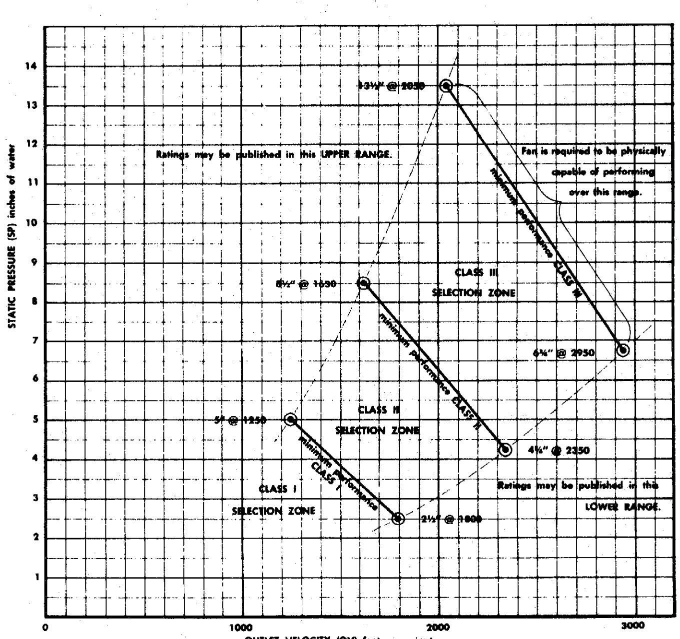
Sheet 4 of 5



OPERATING LIMITS FOR CENTRIFUGAL FANS—Tubular.

AMCA STANDARD
2408-69
Sheet 5 of 5

Unity Basis = Standard Air Density of .075 lb/ft^3

At sea level (29.92 in. Hg barometric pressure) this is equivalent to dry air at $70^{o}F$.

Air Temp. °F	Altitude in Feet Above Sea Level												
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	15000	20000
	Barometric Pressure in Inches of Mercury												
	29.92	28.86	27.82	26.82	25.84	24.90	23.98	23.09	22.22	21.39	20.58	16.89	13.75
70	1.000	.964	.930	.896	.864	.832	.801	.772	.743	.714	.688	.564	.460
100	.946	.912	.880	.848	.818	.787	.758	.730	.703	.676	.651	.534	.435
150	.869	.838	.808	.770	.751	.723	.696	.671	.646	.620	.598	.490	.400
200	.803	.774	.747	.720	.694	.668	.643	.620	.596	.573	.552	.453	.369
250	.747	.720	.694	.669	.645	.622	.598	.576	.555	.533	.514	.421	.344
300	.697	.672	.648	.624	.604	.580	.558	.538	.518	.498	.480	.393	.321
350	.654	.631	.608	.586	.565	.544	.524	.505	.486	.467	.450	.369	.301
400	.616	.594	.573	.552	.532	.513	.493	.476	.458	.440	.424	.347	.283
450	.582	.561	.542	.522	.503	.484	.466	.449	.433	.416	.401	.328	.268
500	.552	.532	.513	.495	.477	.459	.442	.426	.410	.394	.380	.311	.254
550	.525	.506	.488	.470	.454	.437	.421	.405	.390	.375	.361	.296	.242
600	.500	.482	.465	.448	.432	.416	.400	.386	.372	.352	.344	.282	.230
650	.477	.460	.444	.427	.412	.397	.382	.368	.354	.341	.328	.269	.219
700	.457	.441	.425	.410	.395	.380	.366	.353	.340	.326	.315	.258	.210
	AIR DENSITY RATIOS												

Density is directly proportional to barometric pressure established by the U. S. Standard Atmosphere-Altitude-Pressure relation. "Manual of the ICAO (International Civil Aviation Organization)," NACA Technical Note 3182, May, 1954. Density is inversely proportional to absolute temperature.