AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

30 West University Drive • Arlington Heights, IL 60004 • 847-394-0150 • www.amca.org

TO: expartecommunications@hq.doe.gov (sent via email)
FROM: Wade Smith, Executive Director, AMCA International
DATE: December 23, 2011
RE: Memorandum Memorializing Ex Parte Communication, December 19, 2011 for DOE impending determination of coverage for commercial and industrial fans, blowers, and fume hoods, Docket No EERE-2011-BT-DET-0045.

Meeting Purpose: The meeting was requested by AMCA International to introduce the association's leadership, standards, and experience in developing fan standards to DOE; to learn more about the DOE process for developing regulations for fan efficiency standards; and to inform DOE on how commercial and industrial fan markets work.

Representing the U.S. Department of Energy:

- John Cymbalsky, Supervisor, Appliance Standards, Building Technologies Program
- Charles Llenza, Project Manager, Appliance Standards, Building Technologies Program

Representing AMCA International:

- Michael Barry, Chairman of the Board, AMCA and President, Twin City Fan
- Vic Colwell, President, AMCA and VP Sales and Marketing, Loren Cook
- Wade Smith, Executive Director, AMCA
- Michael Ivanovich, Director of Strategic Energy Initiatives, AMCA

Notes:

- Introductions
- About AMCA and the U.S. fan market

  AMCA summarized its history and membership, emphasizing its mission to promote the health, growth, and integrity of the air movement and control industry in the interest of the public. (Exhibit 1).

- About DOE and DOE's efficiency standards program

  DOE summarized how efficiency standards are developed, and stated that DOE had not yet made a final ruling on its proposed determination of coverage. DOE also stated that setting fan efficiency regulations was discretionary, not mandatory, so there was no certainty that regulations would be developed. If DOE were to decide to set efficiency standards, the process would take approximately

two years (and possibly three) and compliance would be required three years later (but which could possibly be extended to five years because this would be a first-time ruling). DOE also suggested that AMCA consider taking proactive measures by working with industry stakeholders, such as efficiency groups, utilities, etc. to develop a joint proposal for fan efficiency regulation.

- Commercial fan market perspective
  AMCA described that there are many different types of fans because there are so many different applications based on duty and size (Exhibits 2 and 3) Different types of fans have different efficiencies, but even lower-efficiency fans can be better selections for specific duties, such as material handling, emergency smoke evacuation, and low-pressure high volume air movement. The variety of fans and applications will make fan regulation difficult. AMCA also provided an example of how some commercial fans are sized and selected, with smaller fans having lower efficiencies, but lower first costs, are often purchased instead of larger fans that cost more but can have energy-cost paybacks of less than 1 year (Exhibit 4).

- Industrial fan market perspective
  AMCA described how a large fraction of the industrial fan market is design/build, whereby specific fans are custom designed and built for the one application they will be used, such as for a utility plant or a manufacturing process. AMCA also discussed how industrial fan owners are very aware of energy efficiency because of the large amount of energy they use – and there are often penalties to fan manufacturers (liquidated damages) if fans installed in the field do not yield the promised operating efficiencies when tested.

- AMCA's leadership on fan efficiency standards and performance certification
  AMCA discussed it's proactive fan efficiency leadership in the development of standards and having its standards adopted into national codes and standards, and the testing program it runs to verify manufacturer certification of ratings and efficiency performance (Exhibit 1 and 5).

Exhibit 1: AMCA Fact Sheet on Fan Efficiency Leadership
Exhibit 2: Photos of different fan types
Exhibit 3: Photos of different fan types
Exhibit 4: Example of a commercial fan sizing/selection software output
Exhibit 5: Final language on minimum fan efficiency proposed by AMCA and adopted by 2012 International Green Construction Code (prescriptive path for buildings 25,000 sq ft and less).

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About AMCA International and Fan Efficiency

Prepared Dec. 16, 2011 by
AMCA International
30 W. University Drive, Arlington Heights, IL 60004
www.amca.org

Overview of AMCA International

The Air Movement and Control Association International (AMCA) is a not-for-profit trade association. Member firms manufacture commercial and industrial fans, blowers, dampers, louvers, air-monitoring stations, acoustical products, and more.

AMCA's mission to promote the health, growth, and integrity of the air movement and control industry in the public interest of the public.

AMCA has its roots going back to 1917, when 11 companies met for the first time as the National Credit Association of Fan Manufacturers. In 1919, the organization changed its name to the National Association of Fan Manufacturers (NAFM). In 1955, NAFM consolidated with the Power Fan Manufacturers Association to become the Air Moving and Conditioning Association (AMCA). This is considered the formal start of "AMCA" as we know it. In 1977, AMCA changed its name to Air Movement and Control Association International to reflect its broader product and regional scope.

AMCA International currently has 291 members with three core regions having the majority of members, as shown in Table 1. Table 1 also reflects how our international scope extends to serving our members' information needs through our Website, www.amca.org.

Table 1: AMCA International Membership Regions

Region	Member Companies	Website Traffic (%)
North America	161	72
Pacific Region	89	19
Europe	22	7
Other	19	3

AMCA has four divisions: Air Movement; Air Control; Acoustic Attenuation, and Air Flow Measurement Monitoring Stations. Members can be represented in more than one region. The Air Movement Division is by far the largest, with 213 members.

AMCA has a long history of developing test standards, such as AMCA 210 *Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating*, which was first published in 1923 in response to fan-rating problems encountered by the U.S.

Navy during World War I. AMCA currently maintains 20 different testing standards, 15 of which are ANSI-certified. Thirteen AMCA standards focus on fans, nine of which are ANSI-certified.

AMCA International has been certifying fan performance for over 60 years. Participating in the Certified Ratings Program is a primary reason why a large number of member firms join AMCA. Currently, 193 (66%) of AMCA members certify at least one product. The directory of certified products that AMCA maintains for public use is the most heavily trafficked section of our Website after the Home page.

AMCA Energy Efficiency Leadership

AMCA International has been on the forefront of the development of U.S. and international standards for fan efficiency. We participated in the International Standards Organization's development of ISO 12759 *Efficiency Classification for Fans*, and published a U.S. standard, AMCA 205 *Energy Efficiency Classification for Fans* shortly afterward. AMCA 205 was developed slightly behind ISO 12759 so the two standards could be harmonized.

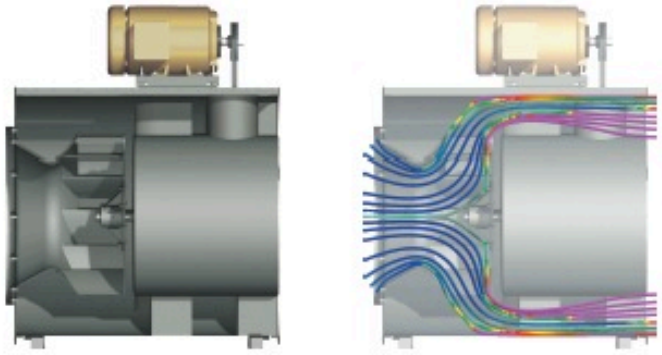
AMCA began certifying fan efficiency performance in 2011, while also working with ASHRAE and the International Code Council to adopt fan-efficiency standards that reference AMCA 205. The following is a timeline of AMCA fan-efficiency leadership for codes, standards, regulations, and guidelines.

- In 2005, AMCA partnered with the U.S. Dept. of Energy to launch the Fan System Assessment Tool (FSAT), which calculates the amount of energy used by an industrial fan and examines fan-system performance characteristics. AMCA still provides FSAT training for the DOE.
- ISO began development of Standard 12759 in 2009, with U.S. and AMCA participation and AMCA 205 development started later the same year.
- AMCA 205 was published in 2010, slightly after ISO 12759-10.
- AMCA 205 was revised in 2011 and will soon be publicly available; ANSI approval is expected in the first quarter of 2012.
- In 2011, AMCA drafted a Continuous Maintenance Proposal for ANSI/ASHRAE/IES 90.1, 2011, which eventually became "Addendum u." Following an advisory public peer review, AMCA led the development of the first draft of revised language for Addendum u, which is now in the hands of the SSPC 90.1 Mechanical Subcommittee, for consideration toward the January 2012 ASHRAE Winter Meeting.
- AMCA developed a code change proposal for the 2012 International Green Construction Code, which was adopted despite opposition from AHRI.
- AMCA responded affirmatively to a U.S. Dept. of Energy proposed determination for defining commercial fans, blowers, and fume hoods as "covered equipment" under the Energy Policy and Conservation ACT. AMCA is seeking to collaborate with the DOE in the development of fan efficiency standards.
- Reference to AMCA 205 and Fan Efficiency Grades are in the current working draft of the 50% Advanced Energy Design Guide Big Box Retail Stores.
- Pending developments with Addendum u for 90.1-2010, in 2012, AMCA plans to assist with the harmonization of ASHRAE 189.1 and the IECC with 90.1, and the IGCC with 189.1.

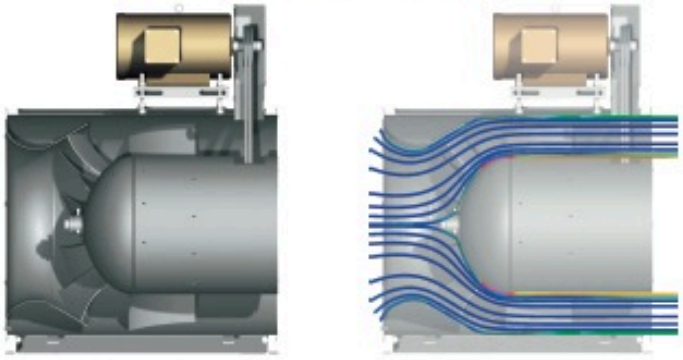
Exhibit 2

Photos of Different Fan Types

Centrifugal Inline • FEG 67



Mixed-Flow Inline • FEG 80



Computational Fluid Dynamics (CFD)
Model Of Mixed-Flow Impeller

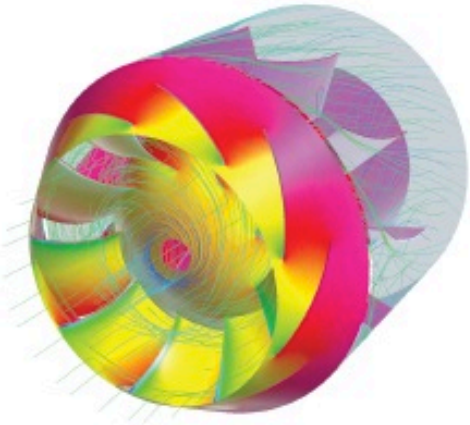


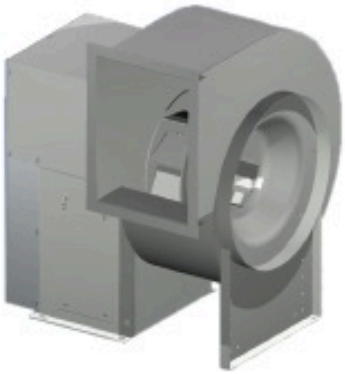
Exhibit 3

Photos of Different Fan Types

Centrifugal Restaurant Exhaust • FEG 67

Axial Smoke Control • FEG 53

Centrifugal SWSI • FEG 85



Mixed-Flow Inline • FEG 80

Axial Fan • FEG 60

Energy Recovery Ventilator • FEG 50

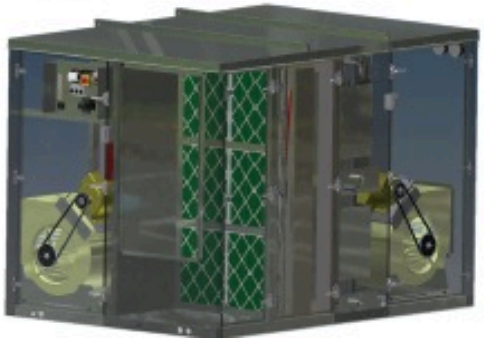


Exhibit 4

Fan Selection Example

Coolaware v6.0 - Selected CA-DWDI Fans - BELT DRIVE

Model	Volume CFM	SP inwc	Power HP	Motor HP	RPM	Weight lbs	Relative Cost	Budget Price	Operate Cost/Yr	Payback (Years)
365CADWDI	80000	3	118	125	1475	2330	1.31	$20,700	$126,722	Never
402CADWDI	80000	3	94.0	100	1150	2850	1.00	$15,900	$100,948	-
445CADWDI	80000	3	76.6	100	907	3570	1.12	$17,800	$82,262	.10
490CADWDI	80000	3	62.6	75.0	732	4170	1.09	$17,300	$67,227	.04
540CADWDI	80000	3	57.8	60.0	617	5200	1.26	$19,900	$62,072	.10
600CADWDI	80000	3	53.4	60.0	511	6310	1.47	$23,400	$57,347	.17
660CADWDI	80000	3	51.8	60.0	440	7490	1.77	$28,100	$55,629	.27
730CADWDI	80000	3	54.3	60.0	389	9170	2.00	$31,700	$58,313	.37

Nom IMPLR(in)	Class	OB1	OB2	OB3	OB4	OB5	OB6	OB7	OB8	LwA	dBA	Drive Loss
36.5	III	116...	112...	110...	107...	103...	98	92	85	109	97	4%
40.3	II	114...	106...	109...	103...	99	93	87	79	105	94	4%
44.5	II	109...	105...	104...	99	95	89	82	75	101	90	4%
49.0	I	104...	102...	100...	96	90	84	77	69	97	86	4%
54.0	I	101...	101...	98	93	87	80	73	66	95	83	4%
60.0	I	99	99	94	90	84	77	70	63	92	80	4%
66.0	I	98	97	92	89	82	74	67	60	90	78	4%
73.0	I	97	96	92	88	81	73	66	59	89	78	4%

View Curve
View Detail
Export Cad
View Spec
AMCA
Print All
Save
< Back

Click heading to sort grid. Right click on grid for more options.

Relative Cost and Budget Price (US $) include Fan, ODP motor and drive and does not include accessories. (3/4 hp and above assume 3 phase/voc)
Operating cost (US $) based on 24 hours/day, 365 days/year and $ .1479 per kwh. Right click on grid to change operating criteria.
AMCA Impeller(s) Licensed for Air Performance.

Centrifugal Fan · FEG 85

Double Width / Double Inlet

Exhibit 5

Language adopted into the 2012 International Green Construction Code

CHAPTER 6

607.2.2.3 Minimum fan efficiency. Stand alone supply, return and exhaust fans designed for operating with motors over 750 watts (1hp) shall have an energy efficiency classification of not less than FEG71 as defined in AMCA 205-10. The total efficiency of the fan at the design point of operation shall be within 10 percentage points of either the maximum total efficiency of the fan or the static efficiency of the fan.
Add new definition as follows:

SECTION 202
DEFINITIONS
FAN EFFICIENCY GRADE (FEG). A numerical rating identifier that specifies the fan's aerodynamic ability to convert shaft power, or impeller power in the case of a direct driven fan, to air power. FEGs are based on fan peak (optimum) energy efficiency that indicates the quality of the fan energy usage and the potential for minimizing the fan energy usage.
Add new standard as follows:

CHAPTER 12
REFERENCED STANDARDS
AMCA Air Movement and Control Association International
30 West University Dr.
Arlington Heights IL 60004-1806
205-10 Energy Efficiency Classification for Fans