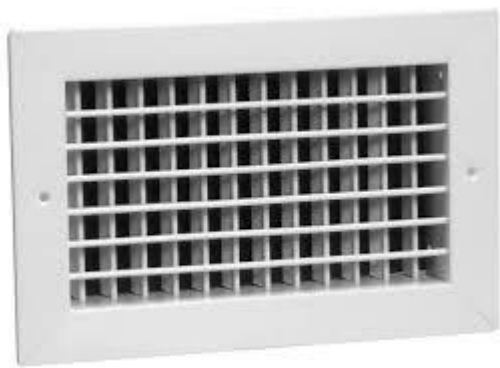


# CODE&STANDARDS에서 형조기기 성능인증요건

국제 인증이 필요하다



# CODE & STANDARDS관계

Code : 법 MANDATORY

STANDARDS:기술표준이나CODE에서 인용 또는 ENDORSE하면 법적요건이됨

# HVAC관련 CODE &STANDARDS

주요 CODE &STANDARDS

KEPIC MH

ASHRAE

ASME AG-1

AHRI

AMCA

ANSI



# 송풍기



ASME

ASHRAE

AMCA

AMCA 210-1974, Laboratory Methods of Testing Fans for Rating Purposes

AMCA 300-1967, Test Code Sound Rating Air Moving Devices

ASHRAE 68-78, Method of Testing In-Duct Sound Power Measurement  
Procedure for Fans

UL

ANSI

ASTM

NFPA

## BA 5123 측정

시험 측정은 AMCA 210에 따라야 하며 결과값은 AMCA 210 부록 D에서 설정한 한계값 내에 있어야 한다. 송풍기 성능시험의 시험항목은 다음과 같다.

### BA 5123.1 유량

피토 튜브에 의한 방법 또는 AMCA 노즐 방법을 사용하여 AMCA 210에 따라서 송풍기 유량을 결정하여야 한다.

### BA 5123.2 압력

압력은 AMCA 210 피토관 또는 액주계를 사용하여 측정하여야 한다.

### BA 5123.3 동력

송풍기에 입력된 축동력을 정하기 위해 AMCA 210에 따라서 측정하여야 한다. KEPIC-EEB 2200에 따르는 완전한 시험 결과를 갖춘 구동기는 교정된 구동기의 요건을 만족시킨다.

### BA 5123.4 송풍기 속도

송풍기 속도는 AMCA 210에 따라서 측정하여야 한다.

### BA 5123.5 기타

중간 계산에 연관된 온도 및 기압과 같은 측정은 AMCA 210에 따라야 한다.

**BA 5130 음향시험**

다음중 한 방법에 따라서 음향시험 자료를 구해야 한다.

**BA 5131 반반향실법**

AMCA 300에 따라서 음향출력레벨 등급을 구해야 한다.

**BA 5132 유도법**

ASHRAE 68에 따라서 음향출력레벨 등급을 선정하여야 한다

The eight certified programs covered by AMCA are as follows:

1. Air Performance

2. Sound and Air Performance

3. Air Leakage/Air Performance

4. Air Leakage

5. Water Penetration/Air Performance

6. cfm/Watt  Air Performance

7. Airflow Measurement Station  Air Performance

8. Positive Pressure Ventilators  Air Performance





The AMCA International Certified Ratings Program is a globally recognized third-party program that gives buyers, specifiers and users assurance that manufacturers' published data for air movement and control products are accurate.

### AMCA Certified Ratings Program

There are three AMCA rating standards that apply to air moving and control products. These are the standards under which AMCA license agreement are granted. Publication 211 is the testing procedure that applies to fans for air performance. Publication 311 applies to fans for sound performance. Publication 511 applies to dampers and louvers for air performance, air leakage, and water leakage.

### AMCA Certified Rating Seals

The AMCA certified rating program seal assures you that a product line has been tested to the appropriate AMCA standards in accordance with a legal license agreement and that the manufacturer's catalogued certified ratings have been submitted to the AMCA staff for approval prior to publication.

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For a product to be licensed to bear the AMCA seal under the certified rating program, it must first be tested in an accredited lab (usually the manufacturer's or an independent testing facility accredited by AMCA's technical staff). To obtain a license to use the AMCA seal, each manufacturer agrees to eight major requirements:

1. Published ratings will be based on tests conforming to the appropriate AMCA standard.

2. All tests will be made in a laboratory accredited by the AMCA technical staff.

3. Test results will be submitted to the AMCA staff for checking.

4. A unit selected by the AMCA staff will be sent to the AMCA laboratory for a "Precertification Check".

5. All catalogs containing "Certified Ratings" will be submitted to the AMCA staff for approval before publication.

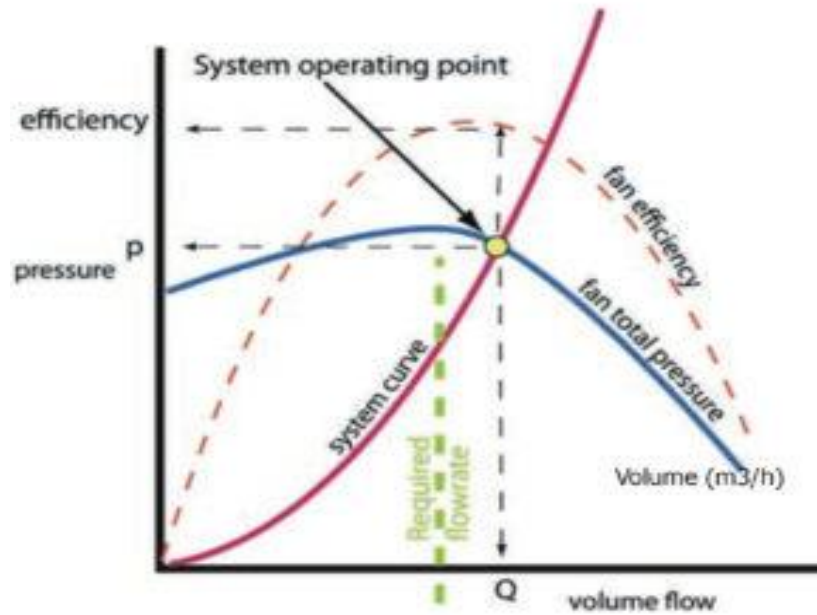
6. Every three years each licensed product line will be subject to continuing check tests in the AMCA laboratory.

7. Licensed products will also be liable to challenge tests initiated by competing manufacturers who may challenge published versus actual tested performance of a product. The AMCA license will be withdrawn if the product does not continue to perform as cataloged.

8. Fees and assessments will be paid to fund the program.



# FAN PERFORMANCE CURVE



# 냉동기



**AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE (AHRI)**

**ANSI/AHRI 450-99 Water-Cooled Refrigerant Condensers, Remote Type**

**ANSI/AHRI 480-01, Refrigerant-Cooled Liquid Coolers, Remote Type**

**AHRI 550/590-03, Water Chilling Packages Using Vapor Compressor Cycle**

**AMERICAN SOCIETY OF HEATING REFRIGERATING, AND AIR CONDITIONING ENGINEERS (ASHRAE)**

**ASHRAE, Terminology of Heating, Ventilation, Air Conditioning, and Refrigeration, 2nd Edition, 1991**

**ANSI/ASHRAE 15-04, Safety Standard for Refrigeration Systems**

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)**

**ANSI/ASME B31.5-01, Refrigeration Piping and Heat Transfer Components**

## **AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)**

ANSI/ARI 450–99 Water–Cooled Refrigerant Condensers, Remote Type

ANSI/ARI 480–01, Refrigerant–Cooled Liquid Coolers, Remote Type

ARI 550/590–03, Water Chilling Packages Using Vapor Compressor Cycle

## **AMERICAN SOCIETY OF HEATING REFRIGERATING, AND AIR CONDITIONING ENGINEERS (ASHRAE)**

ASHRAE, Terminology of Heating, Ventilation, Air Conditioning, and Refrigeration, 2nd Edition, 1991

ANSI/ASHRAE 15–04, Safety Standard for Refrigeration Systems

## **AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)**

ANSI/ASME B31.5–01, Refrigeration Piping and Heat Transfer Components

## **RATING**

Performance ratings shall be based upon the actual design conditions supplied by the design specification, rated in accordance with ARI 550/590, and tested in accordance with Mandatory Appendix RA-I.

**ASHRAE REQUIREMENT: SYS42.10**

## **SELECTION**

### **Ratings**

A centrifugal chiller with specified details is typically selected using a manufacturer's computer-generated selection program, many of which are ARI certified. Capacity, efficiency requirements, stability requirements, number of passes, water-side pressure drop in each of the heat exchangers, and desired electrical characteristics are input to select the chiller.

### **UL 984**

**Hermetic Refrigerant Motor-Compressors**

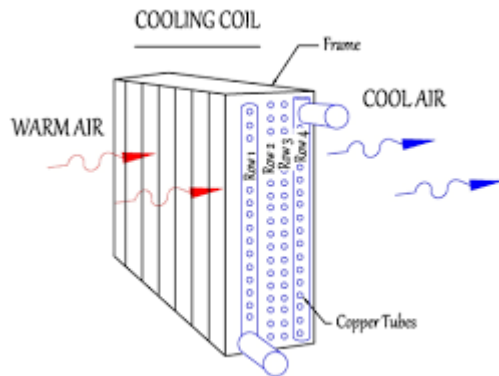
# COIL

COIL의 열역학 계산인자

-유체의 압력 온도 습도 BYPASS

-코일의 열전달 면적 형상 열전달계수 오염계수

-전달유체의 온도 압력 열전달 계수 흐름형상





AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)

ANSI/ARI 410-01, Forced Circulation Air Cooling and Air Heating Coils

ARI 430-99, Central Station Air Handling Units

AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR CONDITIONING ENGINEERS  
(ASHRAE)

ASHRAE 33-00, Methods of Testing Forced Circulation Air Cooling and Air Heating Coils

ASHRAE Terminology of Heating, Ventilation, Air-Conditioning, & Refrigeration, 2nd Edition, 1991

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B16.5-97, Pipe Flanges and Flanged Fittings: NPS 1/2 through 24

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

ANSI/SAE AMS 3410J-1998, Flux, Silver Brazing

ANSI/SAE AMS 3411D-1998, Flux, Silver Brazing High Temperature

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC-Vis1-00, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive  
Blast Cleaning

SSPC-PA1-00, Shop, Field and Maintenance of Steel

UNDERWRITERS LABORATORIES (UL)

UL 1996.3-2004, Standard for Duct Heaters

# KEPIC MH COIL 요건

CA 5200 냉수코일, 증기코일 및 휘발성 냉매코일의 시험

CA 5210 일반요건

코일 성능의 검증에는 2 가지의 승인된 방법이 있다.

방법 1은 **코일 성능 인증의 최소 요건으로서,**

**컴퓨터화된 코일 선정 프로그램을 수행한 인증된 결과는 승인할 수 있어야 한다.**

방법 2는 모든 코일

크기의 시험을 요구하지 않는다. 일련의 시험과 코일 선정 프로그램 사이의 상호관계가 총론적인 보고서 또는 발전사업자가 승인할 수 있는 다른 방법으로 문서화될 경우, 추가적인 성능시험은 요구되지 않는다. 용기 속에 있는 코일의 경우, 사고 조건하에서 코일 표면의 응축수 범람의 결과로써 코일 성능에 대한 영향을 보여주는 시험결과를 문서에 포함하여야 한다.

CA 5211 성능검증

공기코일의 성능은 설계시방서의 결정에 따라서 다음 방법중 하나에 의해 검증하여야 한다

### CA 5211.1 방법 1

공기코일의 정격은 ASHRAE 33에 따라서 수행한 시험에서 유도하여야 한다. **코일 공급자는 코일 인증서나 ARI 인증서를 발행하여야 한다.** 각각의 경우에 인증서는 다음 사항을 기술하여야 한다.

- (1) 설계 매개변수에 근거한 코일 용량
- (2) 계산에서 사용된 오염계수(fouling factor)
- (3) ASHRAE 33, 8.2에 기술된 코일에 관련되는 자료. 인증 보고서는 각각의 코일에 대하여 발행하여야 한다. 각각의 모델 번호를 갖는 코일의 경우 인증서에 일련번호 목록을 작성하여야 한다.

### CA 5211.2 방법 2

ASHRAE 33에 따른 실험실에서 실물 코일에 대한 시험은 성능 정격의 결정을 위하여 코일 공급자가 수행하여야 한다. 시험결과는 시험보고서에 문서화하고, 다음의 사항을 포함하여야 한다.

- (1) 설계조건
- (2) 시험방법
- (3) 시험절차
- (4) 계산서
- (5) 코일용량

# DAMPER

AIR MOVEMENT AND CONTROL ASSOCIATION, INC. (AMCA)

AMCA 500D-98, Laboratory Methods for Testing Dampers for Ratings

AMCA 500L-99, Laboratory Methods for Testing Louvers for Ratings

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA-90A-2002, Standard for the Installation of Air Conditioning and Ventilation Systems

UNDERWRITERS LABORATORIES (UL)

UL-555-1999, Standard for Safety, Fire Dampers, and Ceiling Dampers

**UL 555C-1996, Standard for Safety, Ceiling Dampers**

# GRILL RESISTER DIFFUSER-ADC



# 외국제작 회사 홈페이지조사



## Certificates

- UL listed.
- All units ASHRAE 90.1 compliance.
- AHRI certified units.



- Certifications:
  - AMCA licensed Air and Sound (AMCA 210 and 300)
  - UL/cUL listed for Electrical (UL/cUL-705)





- **What's New**

- [Ceiling Radiation Damper UL Classified for Wood Truss Assemblies](#)
- [Backdraft Damper Models Now AMCA Licensed](#)



## Coils

specializes in manufacturing competitively priced, quality engineered replacement and OEM coils. Every coil we build is leak tested with 450 PSIG of dry nitrogen to guarantee 100% quality assurance. And just to be sure you get the performance you expect, **our coils are tested in accordance with AHRI Standard-410-2001.** Coils are constructed with copper tubes in 5/8, 1/2 or 3/8 inch outside diameter (OD), aluminum or copper fins, and galvanized, stainless steel, or copper pans. Insulated coil sections, stainless steel drain pans, and other options are available.



# 국내제 조사 HOME PAGE 조사

ISO9001/14001

KS

Q-MARK

전열 마크



# 결론

## 일반공조 및 원전공조 공히

1. 제조사가 아닌 제3의 공인기관의 성능인증서 필요
2. 설계POINT가 최종 운전POINT가 아님
3. 추후 계통수정시 전산화 성능 프로그램 필요
3. 시험 및 검사의 객관적 입증자료 필요
4. 전산화된 계산근거의 설계 프로그램 필요(냉난방의 열역학은 수작업계산 불가능)
5. 국내규격과 해외 규격의 차이에 대한 입장 수정