

This is a preview of "AMCA 501-17". Click here to purchase the full version from the ANSI store.

AMCA 501-17

Louver Application Manual and Design Guide



Air Movement and Control Association International

AMCA Corporate Headquarters

30 W. University Drive, Arlington Heights, IL 60004-1893, USA
communications@amca.org ■ Ph: +1-847-394-0150 ■ www.amca.org

© 2016 Air Movement & Control Association International

Louver Application Manual and Design Guide



Air Movement and Control Association International
30 W. University Drive
Arlington Heights, Illinois
60004

AMCA Publications

Authority AMCA Publication 501-17 was adopted by the membership of the Air Movement and Control Association International Inc. on May 1, 2017.

Copyright Copyright pending. © 2017 by the Air Movement and Control Association International Inc.

All rights reserved. Reproduction or translation of any part of this work beyond that permitted by Sections 107 and 108 of the United States Copyright Act without the permission of the copyright owner is unlawful. Requests for permission or further information should be addressed to the executive director, Air Movement and Control Association International Inc. at 30 West University Drive, Arlington Heights, IL 60004-1893 U.S.

Objections Air Movement and Control Association International Inc. will consider all written complaints regarding its standards, certification programs or interpretations thereof. For information on procedures for submitting and handling complaints, write to:

AMCA International
30 West University Drive
Arlington Heights, IL 60004-1893 U.S.A.

European AMCA
Avenue des Arts, numéro 46
à Bruxelles (1000 Bruxelles)

Asia AMCA Sdn Bhd
No. 7, Jalan SiLC 1/6, Kawasan Perindustrian SiLC Nusajaya,
Mukim Jelutong, 79200 Nusajaya, Johor
Malaysia

Disclaimer AMCA uses its best efforts to produce standards for the benefit of the industry and the public in light of available information and accepted industry practices. However, AMCA does not guarantee, certify or assure the safety or performance of any products, components or systems tested, designed, installed or operated in accordance with AMCA standards or that any tests conducted under its standards will be non-hazardous or free from risk.

REVIEW COMMITTEE

Randal Geedey Chair	ATOMS AP, LLC
Mike Traver	Arrow United
Jeff Blake	Construction Specialties Inc.
Russell Geist	Construction Specialties Inc.
Justin Navarro, Jr.	Dowco Products Group
Andy Jackson	Greenheck
Dustin Gagner	Industrial Louvers Inc.
Robert Hassler	Kinetics Noise Control Inc.
Bill Vincent	Lite Metal Design
Stoil Pamoukov	Nailor Industries Inc.
Fred Book	NCA Manufacturing Inc.
Peter Blaha	Pottorff
Matthew Joyce	Price Industries Limited
Chelsea Welch	Ruskin
Dane Carey	T.A. Morrison & Co. Inc.
Mike Dean	United Energetech Corp.
Jason Haley	Ventex Inc.
Tim Orris	AMCA International

This is a preview of "AMCA 501-17". [Click here to purchase the full version from the ANSI store.](#)

Related AMCA Documents

Related Publications

AMCA Publication 11	Certified Ratings Program Operating Manual
AMCA Publication 111	Laboratory Accreditation Program
AMCA Publication 512	AMCA Listing Label Program
AMCA Publication 511	Certified Ratings Program Product Rating Manual for Air Control Devices

Related Standards

ANSI/AMCA Standard 500-L	Laboratory Methods for Testing Louvers for Rating
ANSI/AMCA Standard 540	Test Method for Louvers Impacted by Wind Borne Debris
ANSI/AMCA Standard 550	Test Method for High Velocity Wind Driven Rain Resistant Louvers

Table of Contents

Louver Application Manual	1
1. Purpose	1
2. Scope	1
3. Definitions	1
4. Application	2
4.1 Air moving systems	2
4.2 Architectural aesthetics	2
5.1 Frames	2
5.2 Blades	3
5.3 Special application louvers	3
5.4 Special screens	4
5.5 Specialty shaped louvers	4
6. Testing and Certification	4
6.1 ANSI/AMCA Standard 500-L testing	4
6.2 AMCA Publication 511 certification	6
6.3 AMCA 512 Listing Label Program	6
7. System Effects	6
7.1 Inlet and outlet conditions	6
7.2 Accessories	6
7.3 Wind velocities	7
7.4 Impact resistance	7
8. Louver Selection	7
8.1 Determination of performance	7
8.2 Louver available free area determination	8
8.3 Air performance pressure drop	8
8.4 Water penetration performance	8
8.5 Air leakage determination (closed adjustable blade or combination louvers only)	8
8.6 Penthouse sizing and pressure drop	10
9. Basic Construction	10
9.1 Materials	10
9.2 Fabrication methods	10
9.3 Structural support	10
9.4 Louver structurals — calculations	11
10. Accessories	11

10.3 Actuators	12
10.4 Mullion covers/batten plates	12
10.6 Blank-off panels	12
10.7 Filters	12
10.8 Gaskets and seals	12
10.9 Security bars	13
10.10 Structural support.	13
11. Finishes	13
11.2 Prime coat	13
11.3 Clear anodize	13
11.4 Color anodize	13
11.5 Baked enamel	13
11.6 Fluorocarbon coatings	14
11.7 Powdered coatings.	14
12. Installation Methods.	14
12.1 Masonry	14
12.2 Metal subframe	14
12.3 Structural steel	14
12.6 Roof curbs for penthouses.	14
Annex A (Informative) Example Selections	25
Annex B References.	27
Louver Design Guide	31
1. Design Loads	31
1.1 Wind loads	31
1.2 Alternate wind load determinations	31
1.3 Seismic loads.	31
1.4 Sunshade structural design	31
2. Blade Design.	31
2.1 Required information	31
2.2 Design	31
3. Blade Support Design	32
3.1 Application of wind load to louver blade.	32
3.2 Blade bending moment	32
3.3 Blade bending stress	32
3.4 Deflection.	33

4.1 Introduction and engineering assumptions	33
4.2 Mullion analysis	33
5. Splicing Design.	34
5.1 Definition	34
5.2 Purpose	34
5.3 Method	34
5.4 Design process	34
6. Louver Connections to Building Structure	35
6.1 Purpose	35
6.2 Definitions	35
6.3 Design process	35
6.4 Codes.	36
6.5 Prying action	37
7. Reductions in Louver Wind Loads for Louver Porosity	37
7.1 Purpose	37
7.2 Connections.	37
7.3 Louvers as screens	37
7.4 Louvers in wall openings	37
8.1 Impact resistance.	38
8.2 AMCA Publication 512 Listing Label Program	39
Annex A References.	44

This is a preview of "AMCA 501-17". [Click here to purchase the full version from the ANSI store.](#)

AMCA Publication 501-LAM

Louver Application Manual



Air Movement and Control Association International
30 W. University Drive
Arlington Heights, Illinois
60004

Louver Application Manual Contents

1. Purpose	1
2. Scope	1
3. Definitions	1
4. Application	2
4.1 Air moving systems	2
4.2 Architectural aesthetics	2
5.1 Frames	2
5.2 Blades	3
5.3 Special application louvers	3
5.4 Special screens	4
5.5 Specialty shaped louvers	4
6. Testing and Certification	4
6.1 ANSI/AMCA Standard 500-L testing	4
6.2 AMCA Publication 511 certification	6
6.3 AMCA 512 Listing Label Program	6
7. System Effects	6
7.1 Inlet and outlet conditions	6
7.2 Accessories	6
7.3 Wind velocities	7
7.4 Impact resistance	7
8. Louver Selection	7
8.1 Determination of performance	7
8.2 Louver available free area determination	8
8.3 Air performance pressure drop	8
8.4 Water penetration performance	8
8.5 Air leakage determination (closed adjustable blade or combination louvers only)	8
8.6 Penthouse sizing and pressure drop	10
9. Basic Construction	10
9.1 Materials	10
9.2 Fabrication methods	10
9.3 Structural support	10
9.4 Louver structurals — calculations	11
10. Accessories	11
10.2 Subframes	12

10.4 Mullion covers/batten plates	12
10.6 Blank-off panels	12
10.7 Filters	12
10.8 Gaskets and seals	12
10.9 Security bars	13
10.10 Structural support.	13
11. Finishes	13
11.2 Prime coat	13
11.3 Clear anodize	13
11.4 Color anodize	13
11.5 Baked enamel	13
11.6 Fluorocarbon coatings	14
11.7 Powdered coatings.	14
12. Installation Methods	14
12.1 Masonry	14
12.2 Metal subframe	14
12.3 Structural steel	14
12.6 Roof curbs for penthouses.	14
Annex A (Informative) Example Selections	25
Annex B References.	27

This is a preview of "AMCA 501-17". [Click here to purchase the full version from the ANSI store.](#)

Louver Application Manual

1. Purpose

The intent of this publication is to provide information and important points to be considered when designing or specifying installations requiring louvers. The purpose of this manual is not to provide detailed specifications; rather, it serves as a guide toward understanding the various types of louvers available and includes topics to be considered to ensure their proper use.

2. Scope

This publication outlines the application of louvers, including selection for pressure drop, air leakage, water penetration and sound reduction. Examples of louver selection are included. "System Effects," An important section in this publication, should not be overlooked when applying performance data (see Section 7). For information on testing, see Section 6.1; for information on certified ratings, see Section 6.2.

Common industry practices in louver construction, mounting and suggested fastening methods for typical structures have been included to assist the installer.

3. Definitions

3.1 Actuator (operator)

A mechanical accessory item attached to an adjustable or combination louver that moves the blade(s) to either the open or closed position or to an intermediate position for flow modulation. Actuators may be manually, electrically, pneumatically or hydraulically powered.

3.2 Adjustable blade louver

A louver whose blades may be rotated either manually or mechanically.

3.3 Blades

A bar, slat or vane in a louver assembly usually mounted within a frame, normally provided in multiple quantities. Blades are installed parallel to each other so that they restrict passage of water, sound, airborne materials and/or sightlines through the louver.

3.4 Certified rating

A published performance rating that the Air Movement and Control Association (AMCA) International has licensed to bear the AMCA seal. Certifications available include but are not limited to the following: air performance, sound performance, air leakage, water penetration, wind driven

rain, airflow measurement performance or any combination thereof.

3.5 Continuous line (continuous blade)

A term describing a louver constructed with blades that present an uninterrupted horizontal or vertical line to complement or enhance architectural features.

3.6 Combination Louver

Louvers with a combination of stationary blades and adjustable blades.

3.7 Core area

A product of the minimum height and minimum width of the front opening in the louver assembly with the louver blades removed.

3.8 Decibel

A dimensionless number expressing, in logarithmic terms, a level of sound power or sound pressure.

3.9 Discharge loss coefficient

A comparison of the actual flow through the louver vs. the theoretical flow through an opening the same size as the louver.

3.10 Drag coefficient

A dimensionless quantity that is used to quantify the drag or resistance of an object in a fluid environment such as air or water.

3.11 Fixed blade louver

A louver that has blades firmly secured in an open position.

3.12 Frame

The outermost structure of a louver assembly comprising the head, sill and jambs joined together to support the blades.

3.13 Free area velocity

The rate of airflow through the free area of the louver.

3.14 Head

The upper or highest horizontal frame member of a louver.

3.15 Jackshaft

A common shaft used to operate blades in one or more louvers.

3.16 Jamb

A vertical frame member on the sides of a louver.