ArmaComfort® AB Alu Plus - protection at the highest level

MENNICA LEGACY TOWER

The 140-meter Mennica legacy tower rises proudly to the sky, standing out in the Warsaw skyline. The battle to be the tallest, although spectacular, is not the most important aspect in which modern office buildings compete. Sustainable materials, advanced technologies, care for the environment and ensuring optimal conditions inside the building - must go hand in hand with the simultaneous possibility of continuous rearrangement of internal spaces and adapting them to the changing needs of tenants.

Armacell products help to challenge even difficult design problems and achieve the highest standards of performance and safety that are specified for the premium sector of modern office architecture.

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CHALLENGES OF TOMORROW

The city centre of Warsaw is a real testing ground for contemporary architecture. Green certificates, elevators that travel up dozens of floors in a few seconds, impressive glass facades and advanced building control systems – these are elements of the new reality. Where until recently low storey and traditional buildings were erected, today with its glazed façade we are invited by the interior of the Mennica legacy tower. More than 65 thousand square meters of rental space, 45 office floors with a 9-meter water wall in the lobby testify to the scale and progression with which office buildings are designed today.

All automatic lighting control systems, window coverings, air conditioning and humidity control, of course, aim to increase the comfort of the space for employees and visitors. However, the increasing number of devices is also a challenge. The need to build installation risers takes up valuable space, and the work of all equipment creates noise.

COMPETENT INSULATION GUARANTEES COMFORT

Used in the building East Mennica Legacy Tower climate convectors are devices responsible for maintaining optimal thermal comfort in the interiors throughout the year.

In order to balance their hours of operation with the right sound conditions, all fan units – in addition to the manufacturer's standard insulation – have been acoustically treated from the outside with ArmaComfort® AB Alu Plus insulation - providing a barrier to both structural and airborne sounds.

» At The Mennica Legacy Tower, most of the space consists of large-open plan offices, without suspended ceilings or having them only in the form of small islands. So, our role was to find solutions that fit into the specifics and usability of the project, and at the same time, in addition to the optimal temperature, also guarantee acoustic comfort. Taking into account the abovementioned factors, we decided to use ArmaComfort® AB Alu Plus from Armacell – a solution with high specification, designed for spaces with outdoor installations. The advantage of insulation is the fact that it complies to the design requirements at a thickness of 11 mm.
Thanks to its small size and high flexibility, it also allows easy and quick installation even in hard-to-reach places. «

mgr inż. Adam Caliński
Pol-Con Consulting – project designer for the air conditioning system

SAFE AND CLASSY

The design of the air-conditioning system in the Mennica Legacy Tower was also a challenge due to the fire safety level specified in the design, required for exposed insulation and the small space between the ceiling and the usable space.

In addition, it had to meet the expectations of interior designers who have concerns? about plastic materials. ArmaComfort® AB Alu Plus insulation does not require the use of additional finishing layers, but leaves such an option available.

» In order to meet the adopted acoustic design assumptions, we were looking for a product on the market that would meet the fire requirements enabling the installation of insulation on internal installations, and at the same time would be compliant with the provisions contained in the regulations and ensure a high soundproofing effect of the devices with a small material thickness. In addition, we were looking for products from the offer of reputable manufacturers. Our choice fell on Armacell.
ArmaComfort® AB Alu Plus insulation by Armacell responded to all our needs: it has the appropriate class of reaction to fire: B-s1, d0, so it meets the NRO condition (fire retardation) and at the same time does not emit smoke during a fire. It also allows you to protect the interior against noise, and additionally it has met the requirements of interior designers. «

mgr inż. Adam Caliński
Pol-Con Consulting – project designer for the air conditioning system

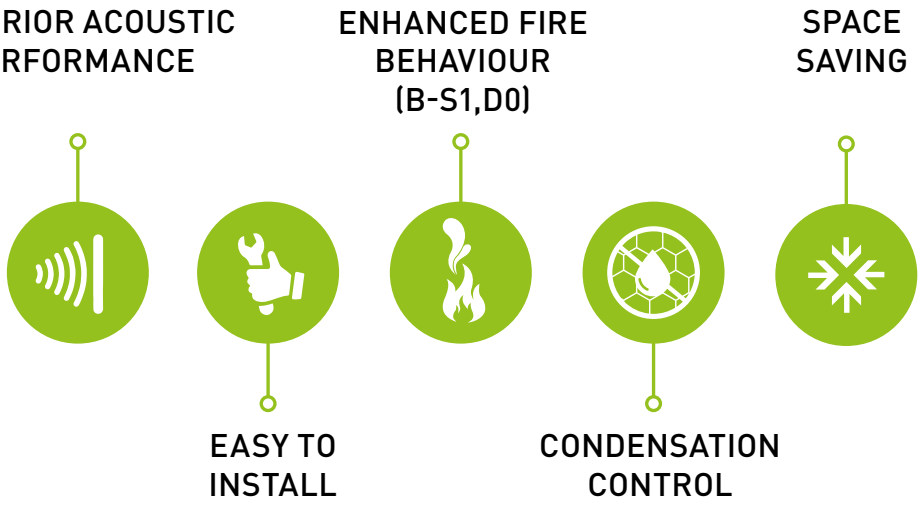
ARMACOMFORT® AB ALU PLUS

ArmaComfort® AB Alu Plus is a modern insulation with excellent acoustic properties and a high class of reaction to fire B-s1, d0. It consists of an epdm-eva acoustic barrier with a thickness of 2 millimeters with aluminium foil and ArmaFlex 9 mm elastomeric foam layer with material soundproofing properties. This combination provides Rw sound insulation according to EN ISO 10140-2, ISO 717-1 at the Rw (C; Ctr) level of 26 dB (-1; -3).

ArmaComfort® insulation sheets are durable and flexible, which, combined with the thickness of only 11 mm, facilitates assembly and precise alignment of layers. Armaflex adhesives are used for gluing ArmaComfort® products, and longitudinal joints are additionally reinforced with appropriate self-adhesive tapes. Thanks to this, we obtain a tight, effective acoustic protective layer, as well as also protecting against the penetration of water vapor, and thus its condensation on the surface of the pipes and their potential corrosion.

The outer layer of silver aluminium facing does not require any additional finishing and ensures an aesthetic appearance of the installation.
The recommended applications for ArmaComfort® AB Alu Plus insulation include, among others, acoustic and anti-condensation insulation for domestic, waste and rainwater sewage pipes, as well as ventilation ducts and air-conditioning devices in residential and commercial buildings.

// Thin and highly effective acoustic insulation
// Excellent material damping properties
// Easy to install and maintain
// Fire retardant material (NRO) - Euroclass B-s1, d0
// Aesthetic, easy-to-clean insulation surface

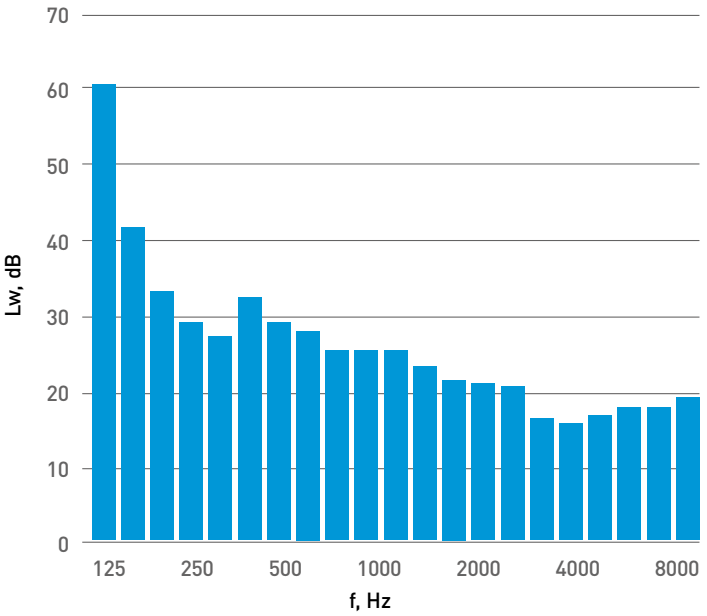


REACTION TO FIRE

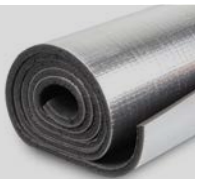
Reaction to Fire is one of the most important problems related to all building materials. ArmaComfort® AB Alu Plus insulation in class B-s1,d0 provides a high level of safety and can be used in utility rooms without additional protective layers. The materials from which it was made are classified as fire retardant. Insulation is in the highest s1 class, given to products emitting only a very limited amount of combustion gases. Additionally, it has the highest subclass d0, relating to the number of flaming droplets formed. These properties make it a safe material that can be used even in open spaces - as in the case of the Mennica Legacy Tower buildings.

Acoustic test results for Low Speed Operation Device without insulation

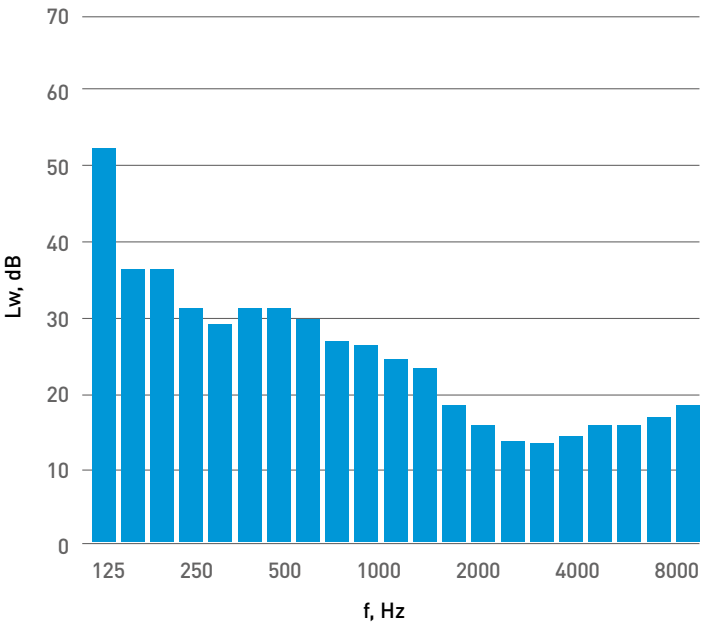
f	L_{WI}	L_{WII}	K_1	$L_{W1/3}$	$L_{W1/1}$
Hz			dB		
100	60,4	28,4	0,0	60,4	
125	41,7	31,1	0,4	41,3	60,5
160	33,7	24,4	0,5	33,1	
200	29,4	18,2	0,3	29,1	
250	27,6	16,1	0,3	27,3	34,7
315	32,4	20,2	0,3	32,1	
400	28,8	13,4	0,0	28,8	
500	28,0	9,6	0,0	28,0	32,4
630	25,6	12,4	0,2	25,3	
800	25,3	9,0	0,0	25,3	
1000	25,5	9,9	0,0	25,5	29,6
1250	23,6	10,2	0,2	23,4	
1600	21,7	11,5	0,4	21,3	
2000	21,4	12,3	0,5	21,0	25,7
2500	21,1	12,8	0,5	20,6	
3150	16,7	13,8	0,5	16,3	
4000	16,3	15,0	0,5	15,8	21,1
5000	17,2	16,3	0,5	16,7	
6300	18,9	17,6	1,3	17,6	
8000	19,1	19,0	1,3	17,9	23,1
10000	20,6	20,6	1,3	19,3	
L_{wAtta} = 27,4 p dB					
L_{WA}= 42,3 dB					



Acoustic test results for Low Speed Operation Device with **ArmaComfort® AB Alu** insulation



f	L_{WI}	L_{WII}	K_1	$L_{W1/3}$	$L_{W1/1}$
Hz			dB		
100	52,2	28,3	0,0	52,2	
125	36,8	26,9	0,5	36,3	52,4
160	36,0	24,8	0,3	35,7	
200	32,0	25,9	1,2	30,8	
250	29,5	21,9	0,5	29,1	35,2
315	31,5	21,0	0,4	31,1	
400	31,3	17,3	0,2	31,1	
500	29,9	14,2	0,0	29,9	34,4
630	27,0	15,1	0,3	26,8	
800	26,1	11,1	0,1	26,0	
1000	24,5	10,9	0,2	24,3	29,4
1250	23,2	11,1	0,3	22,9	
1600	18,4	12,0	0,5	17,9	
2000	15,5	12,7	0,5	15,0	20,6
2500	13,9	12,7	0,5	13,4	
3150	13,9	13,5	0,5	13,5	
4000	14,5	14,5	0,5	14,0	19,0
5000	15,4	15,4	0,5	14,9	
6300	16,4	16,5	1,3	15,2	
8000	18,0	18,0	1,3	16,7	21,6
10000	19,5	19,5	1,3	18,2	
L_{wAtta} = 27 p dB					
L_{WA}= 37,2 dB					



L_{WA} – L_{WA} with AB Alu = 42,3 dB -37.2 dB = 5,1 dB reduction

ACOUSTIC MEASUREMENTS

	Fan coil without insulation	Fan coil with insulation **ArmaComfort® AB Alu**	Delta L_{WA}
ISO 3741-2011	L_{WA} logarithmic sum [dB]	L_{WA} logarithmic sum [dB]	[dB]
Noise Level run Low	42.3	37.2	5.1
Noise Level run Medium	46.5	41.5	5.0
Noise Level run High	49.1	45.6	3.5

Measurement according to EN ISO 3741-2011
Fan coil Daikin FWE07C5FV1B (1210 mmx240 mm x590 mm)

INSTITUTE OF ENERGY
Research Institute
HEAT TECHNOLOGY DEPARTMENT
„ITC" in Łódź
93-208 Łódź, Dąbrowskiego 113 Street
www.itc.edu.pl, e-mail: itc@itc.edu.pl

EFFECTIVENESS CONFIRMED BY RESEARCH

In construction, innovative or atypical solutions, before applying on a large scale, require confirmation of the theory with experience. In the end, the most important thing is real efficiency, and it is easy to ignore important factors during conceptual work. The acoustic properties of ArmaComfort® AB Alu Plus insulation have been repeatedly confirmed by tests, but its effectiveness in protection against noise generated by air-conditioning devices in Mennica Legacy Tower office buildings has been additionally verified this year.

In order to confirm the expected results of noise reduction generated by fan coil units using ArmaComfort® AB Alu Plus insulation, laboratory tests were commissioned, which were carried out by the Institute of Power Engineering ITC in Łódź. The tests were carried out in a reverberation chamber meeting the requirements of PN-EN ISO 3741: 2011. The measurements of the reduction of the sound power level, from the operation of the Daikin FWE07C5FV1B device, showed the high efficiency of the applied sound insulation for all three gears.

Our ear perceives a 3 decibel increase in noise as twice the sound intensity level. The conducted tests confirmed the high efficiency of ArmaComfort® AB Alu Plus insulation. The use of Armacell insulation on the tested fan coil device allowed to reduce noise by up to 4.2 dB.

The tests were carried out on a fan coil unit that was connected to rectangular ventilation ducts supplying and discharging air. The first stage of the research was used to determine the sound power level for a fan coil unit without insulation on the casing, for three gears of the device.

In the next stage, the same measurements were carried out for the device insulated with ArmaComfort® AB Alu Plus mats. The decrease in the level of logarithmic sums of noise (acoustic power) depended on the tested operation of the device. The highest reduction was found for low gear (4.2 dB). At high run, the reduction in sound power for the insulated device was 2.2 dB.

» We hereby confirm the purchase of Armacell's ArmaComfort® AB ALU Plus insulation on the Mennica Legacy Tower office buildings project and its use as acoustic insulation for the fan coil units. The applied solution met our expectations and improved the acoustic comfort in the office and circulation areas. The properties of the product and the external aluminium layer provide enhanced protection against damage during installation, and possible tears are easily repaired with the use of aluminium tape without the necessity to use large patches of material.


Armacell Poland Sp.
Ul. Targowa 2; 55 – 300 S

Subject: References on technical advice and performance of applied acoustic insulation ArmaComfort AB Alu Plus

We hereby confirm that during the period of 2020 and 2021 we have worked on Mennica Legacy Tower A+ class, BREEAM Excellent rated office building project in Warsaw and were responsible for completing all installation works. During that period we have met highly demanding requirements to limit noise level emitted by fan-coils installed in both office rooms and communication routes to keep high level standards.
We have found that to meet these requirements was quite a challenge and finally has been solved after highly professional consultancy with Armacell acoustic experts both visiting our construction site and consulting us on-line. As the solution we have decided to use ArmaComfort AB Alu Plus providing combined, superb both acoustic and thermal insulation.
From the time perspective we thank Armacell Team for they valuable input and advice in solving our request and confirm that applied ArmaComfort AB Alu Plus insulation has met our highest expectations and improved acoustic comfort of A+ class office rooms and communication routes to our highest satisfaction.

rs sincerely

Electra M&E Polska Sp. z o.o
Kierownik Projektu
Rafał Wilgatek

The product properties and aluminium outer layer provide enhanced protection against damage during installation. This also translates into convenient maintenance of the insulation layers during the service life and easy repair of any mechanical damage that may occur during this time. From a contractor's point of view, an important feature of ArmaComfort® AB ALU Plus insulation is also its thinness, which makes it easier to install in hard-to-reach spaces and gives the installer more working space compared to traditional materials with greater thickness. «

Rafał Wilgatek, project manager,
Electra M&E Polska Sp. z o.o

ARMACELL - A WIDE RANGE OF SOLUTIONS

Armacell offers a number of technical insulation products, including acoustic insulation. Depending on the needs and the required properties, we can easily choose products for various applications and conditions, and in the case of unusual issues, we can use the professional support of technical advisors who will provide the necessary information or commission profiled tests to provide the best solutions.

In the area of acoustic insulation with Euroclass B-s1, d0, apart from ArmaComfort® AB Plus insulation, Armacell's offer also includes ArmaComfort® AB Alu insulation. It is a material consisting of a 2 mm epdm-eva acoustic barrier with an aluminium facing and 10 mm polyurethane insulation foam. This insulation is halogen-free and can be used in demanding rooms such as server rooms or data centres.
During the research on insulation for the Mennica Legacy Tower building, the high efficiency of noise protection was also confirmed, which included ArmaComfort® AB Alu insulation when used on fan coil units.

The offer of Armacell also includes innovative acoustic barriers: ArmaComfort® Barrier P, ArmaComfort® Barrier B and ArmaComfort® Barrier B Alu, which allow for effective reduction of sound transmission. They are made of a unique blend based on EVA / EPM, thanks to which they effectively reduce noise even with an insulation thickness of 2 mm. They are available in three colour variants - black, white and silver, and in thicknesses from 1 to 5 mm.




ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,100 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology. For more information, please visit: www.armacell.com.

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