# NCCALME **Aluminum Sound-absorbing Plate**

#### Excellent sound absorption performance

A porous plate with a high porosity molded with our unique sistering technology efficiently absorbs the target frequency.

#### Non-combustible certified material

In addition to being non-combustible certified by the Ministry of Land, Infrastructure, Transport and Tourism, it has also passed non-combustible tests for ships and railway vehicles.

**Can be processed easily** It is almost half the weight of an aluminum plate, and can be cut, drilled, and bent in the same way as a normal aluminum plate.



MEMBER OF THE DAIDO METAL GROUP



## Nature of Sound Volume and Frequency



HZ (Hertz)

A unit that expresses the loudness of sound. It is mainly used as a unit of measurement for noise, in terms of how loud a physical quantity such as sound volume or energy is compared to a reference signal.

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( <b>(</b> ))	
·***	Resi
	D

	(dB)
	140
Jet Plane takeoff	130
oad/Construction work	120
Car Horn	110
Train Underpass	100
Pachinko Parlor	90
Busy Road	80
Noisy Offices	70
TV/Radio Sound	60
Quiet Offices	50
Libraries	40
Residential suburb at Night	30
Rustle of leaves	20

Cause abnormality in hearing
Cause ear pain
Loud as shout
Very noisy
Loud as roar
Can't hear the phone conversation
Have to speak loudly
Able to have a normal conversation
Quiet(Sleep is disturbed at night)
Whispering voice
Very quiet



### Role and principle of sound absorbing material



Calme



and it becomes a high-frequency pitch "high sound". It is generally said that the human ear can hear from 20Hz to 200,000HZ(20kHz). 100 500 1k 5k



A unit that expresses how high or low a sound is. It expresses how many times the sound vibrates in one second,



If only "sound insulation" measures, such as enclosing the noise source with boards or concrete, are taken, the sound will reverberate and increase with the sound insulation material. As a result, the sound that leaks out through gaps such as doorways and vents is amplified, and the sound insulation performance is not demonstrated. In addition to sound insulation, proper sound-absorbing treatment can reduce indoor noise, and the effect of sound-insulating materials can be fully obtained.

Sound absorbing materials are classified into porous materials, plate (membrane) materials, and perforated plates, depending on the principle of sound absorption.

Porous sound absorbing materials such as Calme are materials that have numerous voids or continuous pores in the material. When sound strikes such a material, the air in the material vibrates, causing resistance, and the kinetic energy of the sound is converted into thermal energy by friction between the pores, resulting in a sound absorbing effect. The performance of such sound absorbing materials varies depending on the thickness, density, air permeability, etc. of the same material, as well as the thickness of the air layer behind it.



# **Product Information**



### Size • Weight

2

1.2

600x600

Silver gray

color

specify.

temperature environments.

3

1.7

600x1200

3

3.4

2

2.4

1.6 g/cm<sup>3</sup>

You can specify your favorite

You can print the image you

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(separate painting cost)



\*There is no change in sound absorptio properties depending on the pattern



# Sound Absorption Characteristic

Differences in sound absorption characteristics due to air layers frequency.



# **Physical Properties**

CALME has excellent corrosion resistance, fire resistance, water resistance, weather resistance, etc., and can be used safely in outdoor soundproof walls and near open flames such as oil and gas. Also, since it is made of metal, it is non-combustible and does not accumulate static electricity.

J	A material	B material	C material	
Tensile strength [MPa]	21.1	12.1	7.9	
Stretch [%]	etch [%] 1.8		0.6	
Thermal expansion coefficient(40~200	°) 23.1	23.6	23.1	
Thermal conductivity [°C]	4.02 x 10⁵ J/m hr			
Porosity [%]	45			
Density [kg/m <sup>3</sup> ]	1.59 x 10 <sup>3</sup>			
Heatproof Temperature (Unpainted product)	Regular 200℃, Peak 550℃			

Salt water spray test	After 2000 hours of operation coefficient (C material)		
Accelerated weathering test	After 2000 hours of operation coefficient (C material)		
Ministry of Land, Infrastructure, Transport and Tourism Ministerial certification regarding noncombustible materials, etc.	Obtained Certification		
Japan Ship Quality Control Association Fire safety test	Passed the test Fire Te		
Japan Railway Vehicle Machinery Technology Association Railway vehicle material combustion test	Tested Test NO.: Vehicle		

![](_page_2_Picture_15.jpeg)

Sound absorptio effect experimen

n, there was no decrease in strength or sound absorption

n, there was no decrease in strength or sound absorption

No.: NM-9209, NM-4828 (non-combustible material)

st Procedures Code Part 2 (Surface finishing material)

material combustion test2017-453K, 454K (Non-flammable)

## Instrallation Method

## Cutting/Bending

### Factory cut

We accept orders for shearing, pressing, and laser cutting according to specified dimensions.

### Cut on site

It can be cut with a utility knife with a thick blade or a metal saw for aluminum.

the thickness

#### [How to cut with a utility knife]

![](_page_3_Picture_8.jpeg)

![](_page_3_Picture_9.jpeg)

Mark your desired cut line

Make a notch that Fit the notch to a square corner and is more than half move the end up and down to separate it.

### Bending/Drilling

#### Factory cut

[Bending]] Pipe-shaped molding is available at the factory.

[Drilling]) We accept orders from screw and rivet holes to large-diameter ( $\Phi$  80 or more) drilling according to drawing specifications.

#### Cut on site

[Bending]] In the case of R2m or more, make a base material such as a board or plate, and bend it along with Calme. [[Drilling] or small diameters (less than  $\Phi$ 80), processing with a drill or hole saw for aluminum is possible.

![](_page_3_Picture_18.jpeg)

## Safety and Security

![](_page_3_Picture_20.jpeg)

CALME does not generate dust and can be used safely in places where hygiene is a concern, such as food factories and hospitals. Since it is an aluminum alloy product, it can be recycled as aluminum raw material for casting even when discarded.

![](_page_3_Figure_22.jpeg)

The handling of CALME is basically the same as regular aluminum plates and iron plates. Attach the base (studs or steel moldings) at a pitch of approximately 300 mm and fasten with screws or rivets. Process the screw holes so that they are at least 12 mm away from the end face of CALME

Calum will not exhibit its sound absorption performance if it is placed tightly on a material that does not allow air to pass through, or if it is covered with a material that does not allow air to pass through. In addition, by adjusting the width of the air layer to match the frequency band of the noise source, sound is absorbed more efficiently.

The air layer is approximately 50mm, and is adjusted to be wide for low frequencies and narrow for high frequencies.

## Unit Silencer

The unit type can handle various types of noise.

# Large Ventilating facilities

![](_page_4_Picture_3.jpeg)

![](_page_4_Picture_5.jpeg)

### Underground walkway ventilation equipment

![](_page_4_Picture_7.jpeg)

![](_page_4_Picture_8.jpeg)

CALME, which has a proven track record in soundproofing numerous equipment, has been made into a unit type silencer that is easier to handle. for stacking, making it easy to install them in multiple tiers and connect silencers to each other. Adaptable to various noise levels and installation

### ▼ Amount of volume reduction (Per unit)

L (mm)

1500

1000

			(	,				
Frequency (Hz)		63	125	250	500	1000	2000	4000
olume eduction mount(db)	L1500	(4)	9	21	25	29	27	23
	L1000	(2)	4	19	21	23	20	18

· Although the values are measured by public institutions, they may vary depending on the conditions of use. • 6- The volume reduction at 63Hz is an estimated value.

![](_page_4_Figure_13.jpeg)

![](_page_4_Picture_15.jpeg)

## Sawmill equipment

### Split type sound deadening structure

![](_page_4_Picture_19.jpeg)

## Mechanical Soundproofing

Noise is absorbed within the soundproof wall, reducing transmitted sound and radiated sound from workpiece openings

## Exhaust diffuser

![](_page_5_Picture_4.jpeg)

![](_page_5_Picture_5.jpeg)

Speaker face plate

Soundproof Wall CALME is used on the sound source side to absorb

sound reflected from walls.

## Cooling Tower

### **Electric Power Plant**

![](_page_5_Picture_10.jpeg)

![](_page_5_Picture_11.jpeg)

### 500t Blanking press

![](_page_5_Picture_13.jpeg)

## Large soundproof room for press line

![](_page_5_Picture_15.jpeg)

For large press lines, soundproof walls and shutters are instalied on the press body, and soundproof covers are installed at the entrance and exit. For medium and small presses, the entire equipment is housed in a soundproof room. If a large number of small and mediumsized press machines are installed in a concentrated manner, noise countermeasures can be more efficiently taken by housing them in one soundproof room rather than taking countermeasures individually. This also improves workability and maintainability.

## 2500t Transfer press

![](_page_5_Picture_20.jpeg)

### Notes

- CALME is a material with many excellent properties including sound absorption and design, but in order to fully demonstrate these properties, appropriate design, construction based on that, and correct use are essential.
- This catalog is current as of April 2019. Subject to change without notice.
- The technical data listed in the catalog is based on the test results of our company or public institutions, but may change depending on product variations and usage conditions.
- The color of the product may differ slightly from the reference image or actual sample.
- Some of the published photos include composite photos.
- For embossing, color differences may appear if the direction changes.
- Since the specified color paint is water-based, the color may come off if rubbed with a wet cloth.
- We will disclaim any defects caused by the following items.
- ① Defects caused by design or construction
  - ② Defects caused by base material/bonding material
  - ③ Malfunctions caused by natural disasters, fire, or force majeure
  - ④ Malfunctions caused by normal deterioration over time
  - (5) Malfunctions caused by intention or negligence on the part of the user or a third party
  - 6 Problems caused by indoor condensation or water leaks
  - $\bigcirc$  Problems caused by water leakage

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