

DIM the **LIGHT**
NOISE **lunoo**[®]



**Light, air, sound,
In every space,
It's how you embrace those things.**

Michael Gabellini

In many modern buildings hard materials are used such as concrete, metal, glass, etc. The reflection of sound waves through these materials is often considered to be unpleasant. An excess of noise has a negative impact on our mental health: fatigue, irritation, stress, etc.

Offices

To create a productive work environment, peace is an important factor. Reducing reverberation to a minimum is therefore recommended. Reverberation leads to fatigue, irritation and stress, ... And it's a common fact that these factors cause a decrease of productivity

Restaurant / Bar

When you go to a bar or restaurant, you want to be able to talk with your companions. Reverberation causes restlessness and unsatisfied customers.

In practice, sound absorption often still happens via acoustic walls, but then you lose the initial look and feel of the building. In order not to affect the architecture of the building, you can use the Rosa. The Rosa combines lighting with sound absorption. The shape of the Rosa can be compared to a petal and is available with a spot or without. The Rosa can also be perfectly combined with the Planet Air 700, which then forms the heart of the Rosa, as it were.

With the Rosa as eye-catcher you give a twist to a smooth architectural story.





What exactly is sound absorption?

Sound and reverberation

Sound consists of vibrations that propagate in the air. When a sound wave comes into contact with a material, the movement of the air particles is converted into heat (kinetic energy). Material that bends, for example, absorbs the vibrations. The sound disappears in the material, as it were. Materials that cannot convert sound energy into heat reflect sound and cause reverberation in the room.

The **reverberation time** is the time required for sound to decrease by 60dB while the source of the sound has already stopped.

Sound absorption

Sound absorption determines the amount of sound that is absorbed within one room. If your room consists of hard materials, you can use sound-absorbing materials to shorten the reverberation time within the room, improve speech clarity and avoid background noises.

Sound absorption coefficient

The **sound absorption coefficient** of a material reflects the capacity of the material to absorb the energy of a sound wave. This varies from zero to one. The higher the number, the more sound the material absorbs (or lets through). An open window has an absorption coefficient of 1, which means that all sounds are let through. Acoustic materials absorb sound. A material with a zero coefficient completely reflects the sound. Glass and steel have a value of less than 0.05.

Be careful! Sound absorption is not the same as sound insulation. With sound absorption, it concerns one room, with sound insulation it concerns noise nuisance from one room to another

Rosa - light and sound: one story

Rosa and sound absorption

Depending on the purpose of the room, a reverberation time of 0.5 to 0.8 seconds is recommended in offices. Glass and concrete produce a reverberation time of 1 second. In rooms with a lot of glass or concrete, you can therefore add absorbent materials. To achieve these standards, the Rosa is made of Basotect, a foam made of melamine resin. This foam has the property that it traps sound waves. Reverberation decreases and speech intelligibility improves over a short distance. Basotect has an *absorption coefficient* of 0.9. Sound is therefore almost completely absorbed.

Technical features absorbent material

The sound reducing material of the Rosa exists out of a absorbent foam with noise reduction coefficient (NRC) of 0,9. The absorption surface has a RT60 frequency 250-2000Hz, the time needed to decrease the sound with 60dB at a frequency of 250Hz-2000Hz. The finishing material is flock. The material is fire proof B1 according to the standards EN 13501-1:2007+A1:2009.

Rosa and light

If you want to combine the Rosa with light, you can use the Rosa Spot. The Rosa with a spot is available:

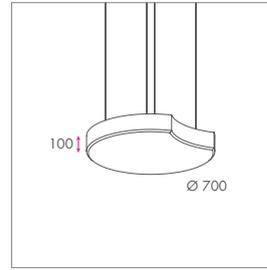
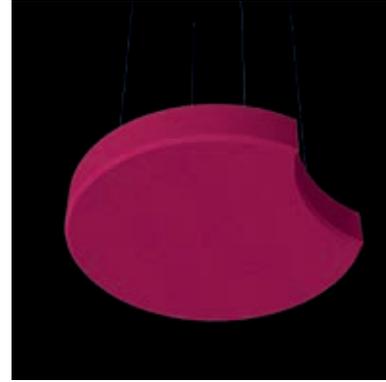
- in 400 lm, 600 lm, 800 lm or 1,000 lm
- with a 20° or 40° reflector
- in light colours 927 or 930. Light colour 930 is recommended for office areas.
- With or without a dimming option (Dali, 1-10V, TE-LE).

Guidelines for the reverberation time

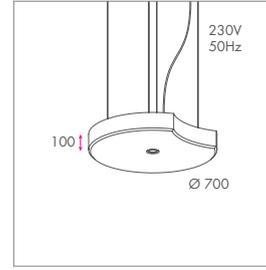
Space	Characteristics	T (250 – 2kHz)
OFFICES		
Cell offices		0.5 – 0.7 s
Offices for multiple persons (≥ 4)		0.5 s
Open offices		0.5 s
Speaking- and meeting rooms	$V < 200 \text{ m}^3$	0.5 – 0.7 s
	$200 < V < 400 \text{ m}^3$	0.6 – 0.8 s
	$400 < V < 800 \text{ m}^3$	0.7 – 0.9 s
	$800 < V < 1600 \text{ m}^3$	0.8 – 1.0 s
SCHOOLS		
Classroom		$\leq 0.8 \text{ s}$
Science rooms / engineering rooms		0.6 s
Music room		0.6 – 0.8 s
Music room	for loud instruments	0.4 – 0.6 s
Music / lecture room		0.8 – 1.2 s
HOTEL, RESTAURANT, LEASURE TIME		
Restaurant / Bar		0.5 – 0.7 s
Sound studio		0.5 s
Movie theatre		0.7 – 0.9 s
Theatre		1.1 – 1.4 s
Auditorium		1.5 – 1.8 s
Opera / Ball room music		1.2 – 1.8 s
Concert hall		1.7 – 2.3 s
Churches		1.4 – 2.6 s



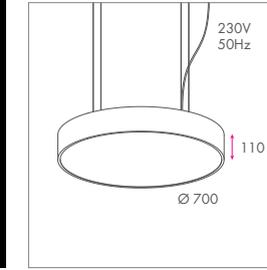
ROSA 700



ROSA SPOT 700 LED



PLANET AIR 700 LED



MOUNTING



SUSPENSION

- fix 4GQ
- fix 4I
- fix 4J
- fix F
- fix P4
- fix RO4

REMARKS

- sound absorbing foam
- multiple colours available

SOUND ABSORBING MATERIAL

- Material: Flocked melamine
- Surface mass: 180g/m²
- Thickness: 100mm
- Density: 11kg/m³
- Absorption: NRC 0,9
- Absorption surface: RT60 frequentie 250-2000 Hz
- Fire resistant: EN 13501-1:2007+A1:2009

CUSTOM MADE FORMS

- Custom-made forms are possible. Please share us your ideas for your project.



LUM. FLUX	LED PWR	CRI	CCT	SYSTEM PWR	EEL	DIM
400 lm @140mA	3,4W 3,4W	90	2700K 3000K	5,0W 5,0W	A+ A+	DALI/1-10V
600 lm @180mA	4,4W 4,4W	90	2700K 3000K	6,0W 6,0W	A+ A+	DALI/1-10V
800 lm @260mA	6,5W 6,5W	90	2700K 3000K	8,1W 8,1W	A+ A+	DALI/1-10V
1000 lm @350mA	8,9W 8,9W	90	2700K 3000K	11,0W 11,0W	A+ A+	DALI/1-10V/ TELE

MOUNTING



ACCESSORIES / OPTIONS



SUSPENSION

- fix 4GQ
- fix 4I
- fix 4J
- fix F
- fix P4
- fix RO4

DRIVERS

- LED-drivers non-dimmable
- LED-drivers DALI
- LED-drivers dim 1-10V
- LED-drivers TELE

REMARKS

- 4000K on request
- sound absorbing foam
- multiple foam colours available



LUM. FLUX	LED PWR	CRI	CCT	SYSTEM PWR	EEL	DIM
5400 lm	45,6W 45,6W	80	3000K 4000K	51W 51W	A+ A+	DALI

MOUNTING



PLANET UP

ACCESSORIES / OPTIONS



SUSPENSION

- fix 4GQ
- fix 4I
- fix 4J
- fix F
- fix P4
- fix RO4

REMARKS

- Optional prismatic plexi

Standard colours



Other colours are possible





WWW.LUNOO.EU

