




ACOUSTIC SOLUTIONS FOR SCHOOLS

OWAlifetime collection

OWA



INVEST SENSIBLY IN EDUCATION: INTELLIGENT SCHOOL ACOUSTICS FROM OWA

THERE ARE STILL TOO MANY SCHOOL BUILDINGS ALL OVER THE WORLD WITH POOR ACOUSTICS. They intensify the already precariously restless situation in day-to-day lessons which 80 % of teachers complain about. Those wanting to invest in better education should therefore do the obvious. Students need good acoustics in order to learn. Through scientific research, OWA is able to provide the perfect solution: ceilings and wall absorbers with acoustic qualities to suit every room type – unbearable value for your money.

Understanding and optimising room acoustics

The most important parameter in terms of room acoustics, reverberation time, indicates how long a sound “lingers” in a room. If the reverberation time is too long, the subsequent syllables will be obscured when speaking, audibility will suffer. That’s where OWA solutions come into play.

The right reverberation time is crucial

It’s not enough to simply focus on absorbing sound, i.e. to achieve the highest possible sound-absorption value. The speech intelligibility in a room solely depends on the reverberation time. Scientific studies show that ideal acoustical conditions exist where sound absorption and sound reflection are equilibrated.

OWA research leads to convincing cost-effective products

Decades of development and numerous school projects conducted by OWA provide evidence that less often yields more! The required reverberation times can be achieved with ceilings that have as little as 55 % sound absorption. That is what makes our solutions so efficient and affordable.

Acoustics and fire protection: both are “best in class” with OWA

Optimised acoustic performance without trade-offs in fire protection: at OWA that goes without saying. Even the standard systems offer excellent fire-protection characteristics of up to F 90/ REI 90 or F 120/ REI 120.

Ball-impact resistant and sound absorbing

The S 3 bws ceiling system allows ceilings in gymnasiums to be ball-impact resistant and sound absorbing at the same time. Hence, multi-purpose room utilization is not a problem.

Variety for the eye: ceilings with design alternatives

Ranging from affordable standard acoustic ceilings to smooth and jointless areas in brilliant white colour – with OWA systems you are able to realize a variety of different ceiling designs.





ACOUSTICS,
EFFICIENCY
AND DESIGN
ALL IN ONE

SCHOOL ACOUSTICS STRICTLY IN ACCORDANCE WITH DIN STANDARDS

DIN 18041 distinguishes between groups of two rooms. For Group A, which is more relevant for education, it stipulates specific requirements, whereas for the second group it offers only recommendations. Crucial for precise compliance with Group A's specifications is a partner that works in accordance with scientific principles, focuses its development on the reverberation time, and has in-depth experience with educational facilities and consequent room types: OWA.



Areas in group A

„Speech transmission over medium and longer distances“

Music

- Classrooms with active playing of music and singing
- Ballrooms for instruction and musical performances

Speech

- Court and council chambers
- Community halls, meeting areas
- Music rehearsal areas in music schools
- Gymnasiums and indoor swimming pools

Teaching

- Classrooms (other than music), lecture rooms
- Music classrooms with audio-visual presentations
- Group areas in nursery schools/senior day care centres
- Lecture rooms, interaction areas
- Auditoriums
- Areas for tele-teaching
- Meeting and conference rooms
- Performance areas solely for electro-acoustic utilisation (e. g. revue theatre)

Sports 1

- Gymnasiums and indoor swimming pools without people
- single course

Sports 2

- Gymnasiums and indoor swimming pools without people
- several courses



Areas in group B

„Speech transmission over short distances“

- High occupancy and open plan offices
- Call centres
- Sales areas, restaurants
- Waiting halls, ticket sales areas
- Doctors and lawyers offices
- Citizens service administration offices
- Surgery, treatment and recovery areas
- Reading and check-out areas in libraries
- Work areas (e. g. teaching workshop)
- Busy public areas
- Foyers, showrooms and stairwells

In what way do the two area groups differ?

Areas in group A

Specific **requirements** have to be met.

Areas in group B

Only **recommendations** are made.

EVERY SCHOOL HAS ITS OWN PARTICULAR ROOM TYPES AND OWA HAS A SUITABLE SOLUTION FOR ALL OF THEM

Classrooms, lecture theatres, group rooms, assembly halls, music rooms, foyers, hallways, escape routes, cafeterias, kitchens – educational institutions have many different kinds of rooms. OWA covers them all – on the spot solutions, affordable with the room appropriate acoustic concept – all in a wide variety on surfaces and design options.

Classrooms, lecture halls, day-care centers

Group A rooms in accordance with DIN 18041 with target reverberation time requirement T_{target} [s]

$$T_{\text{target}} [\text{s}] = 0.32 \cdot \lg(V) - 0.17 \text{ s}$$

Room acoustic concept:
Suspended OWAcoustic® ceiling with a rated degree of sound absorption α_w of at least 0.65.

OWAcoustic® premium pattern recommendations:

Cosmos/N ($\alpha_w = 0.65$)	Regular perforated ($\alpha_w = 0.70$)
Constellation ($\alpha_w = 0.70$)	Bolero Sinfonia ($\alpha_w = 0.85$)
Piano ($\alpha_w = 0.80$)	Brillianto A ($\alpha_w = 0.90$)



School cafeterias

Group B rooms in accordance with DIN 18041 without specific reverberation time requirements.

Recommendations for increasing sound absorption.

Goal: To lower the disruptive sound pressure level and the reverberation time.

OWAcoustic® premium pattern recommendations:

Constellation ($\alpha_w = 0.70$)
Futura ($\alpha_w = 0.70$)
Piano ($\alpha_w = 0.80$)
Bolero Sinfonia ($\alpha_w = 0.85$)





Auditoriums, assembly halls

Multi-purpose room belonging to Group A in accordance with DIN 18041, with a target reverberation time requirement for a mix of both speech and music.

Room acoustic concept:

Various suspended ceilings are possible.

OWAcoustic® premium pattern recommendations:

Sandila/N ($\alpha_w = 0.55$) Cosmos/N ($\alpha_w = 0.65$)

Piano ($\alpha_w = 0.80$)

also possible in combination with:

Sandila/O ($\alpha_w = 0.15$) Cosmos/O ($\alpha_w = 0.15$)

Plain ($\alpha_w = 0.15$)



Foyers, escape routes, stairwells

Group B rooms in accordance with DIN 18041 without specific reverberation time requirements. However, there are recommendations defined in the „Guideline for Indoor Hygiene in School Buildings“ from the German Federal Environmental Agency (UBA) that are not aimed as directly at good speech comprehension, but rather at damping the occasionally occurring very loud noises.

$$T_{\text{target}} = V/1000\text{m}^3 + 0.8 \text{ [s] für } V = 100 \text{ bis } 800 \text{ m}^3$$

OWAcoustic® premium pattern recommendations:

Universal ($\alpha_w = 0.55$)

Constellation ($\alpha_w = 0.70$)

OWAplan ($\alpha_w = 0.60$)



Gymnasiums

Group A room in accordance with DIN 18041 with target reverberation time requirements T_{target} [s] ($V = 2000$ to 8500 m^3).

$$T_{\text{target}} \text{ [s]} = 1.27 \cdot \lg(V) - 2.49 \text{ s} - \text{Sport 1 for lessons for a single group}$$

$$T_{\text{target}} \text{ [s]} = 0.95 \cdot \lg(V) - 1.74 \text{ s} - \text{Sport 2 for lessons for multiple groups}$$

Room acoustic concept:

Suspended OWAcoustic® ceiling with a rated degree of sound absorption α_w of at least 0.65 in combination with the ball impact-resistant system S 3 bws.

OWAcoustic® premium pattern recommendations:

Cosmos/N ($\alpha_w = 0.65$) Bolero | Sinfonia ($\alpha_w = 0.85$)

Constellation ($\alpha_w = 0.70$)

Acoustic solutions for schools

OWA focuses on the German industrial standard DIN 18177

Together with the WETEC association, OWA has decisively contributed to creating the new DIN 18177 „Factory-made mineral tiles by means of wet processing – characteristics and test procedures“. DIN 18177 regulates only the manufacturing and properties of mineral tiles and defines the requirements for factory-made mineral tiles using wet processing (wet felt). In addition to the basic requirements, such as application ranges, norm-related information, terms, symbols and abbreviations, general and specific requirements, test procedures, conformity assessment, mineral tile product names, labelling, etc., DIN 18177 defines the following classes:

- Emission of volatile organic compounds (TVOC)
- Emission of formaldehyde
- Air permeability

Many OWAacoustic® premium and smart products are classified as TVOC 1 and are significantly below the limit specified by the „Blue Angel“ eco label. As with the emission of volatile organic compounds (TVOC), many OWAacoustic® premium and smart products show considerably lower formaldehyde emissions than 60 g/m³, the limit set by the eco label „Blue Angel“. This classifies them as FH 1 according to DIN 18177.

Due to the so-called filter effect, tiles with higher air permeability accumulate more dust. This affects the decorative look of the interior design tiles. Due to the low air permeability, OWAacoustic® products reduce this effect. This keeps the tiles surface looking crisp and clean for much longer.

Errors excepted!



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