



Knauf AMF Planning Aid

Better Acoustics in Room Category B

Rooms as per DIN 18041



Planning aid for better acoustics

DIN 18041 “Acoustic quality in rooms – Specifications and instructions for room acoustic design“, which was newly published in 2016, is regarded as the normative basis (Germany) for the acoustic improvement of a room. But: how can the A/V ratio (equivalent sound absorption area A in relation to the room volume V) be easily determined? How can you effectively design the room acoustics of your project? With the Knauf AMF planning aid we offer you a simple aid for the acoustic improvement of a room in room category B. You’re planning a restaurant, for example? Then your project falls into room category B3.

Room category	Usage type	Examples	Room height $h \leq 2.5$ m	For room heights > 2.5 m																						
RG B3	Rooms for long-term stay	<ul style="list-style-type: none"> ■ Exhibition halls with interactivity or increased noise levels (Multimedia, Sound-/video art etc.) ■ Circulation areas in schools and child care facilities (kindergartens, nursery, shelter etc.) ■ Circulation areas where people are likely to congregate in hospitals and care facilities (e.g. open waiting areas) ■ Patient waiting rooms ■ Break rooms ■ Hospital rooms, quiet rooms ■ Operating theatres, treatment rooms ■ Examination rooms, consultation rooms ■ Restaurants, Dining rooms 	$A/V \geq 0.20$	$A/V \geq [3.13 + 4.69 \cdot \lg(h)] \cdot \exp^{-1}$																						
Room category	Sound absorption coefficient $\alpha_{250 / 500 / 1000 / 2000}$ Hz															Correction values K_{gr}										
	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.2	h =	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
RG B2	0.40	0.40	0.45	0.45	0.50	0.50	0.55	0.60	0.65	0.70	0.75	0.85	0.95	1.10	1.25	1.50	1.90		1.00	1.12	1.25	1.37	1.50	1.62	1.74	1.87
RG B3	0.50	0.55	0.60	0.60	0.65	0.70	0.75	0.80	0.85	0.95	1.00	1.15	1.25	1.45	1.70	2.00		1.00	1.11	1.22	1.33	1.44	1.56	1.67	1.78	
RG B4	0.65	0.70	0.70	0.75	0.80	0.85	0.90	1.00	1.05	1.15	1.25	1.40	1.60	1.80				1.00	1.09	1.19	1.28	1.37	1.47	1.56	1.65	
RG B5	0.75	0.80	0.85	0.90	0.95	1.00	1.10	1.20	1.25	1.40	1.50	1.70	1.90					1.00	1.08	1.16	1.24	1.32	1.40	1.48	1.56	

Table: Planning aid for improving acoustics in rooms in room category B.

ROOM CATEGORY B1:

Rooms without quality of stay (including corridors, staircases, foyers as pure traffic areas without waiting area or reception)
– no requirements

ROOM CATEGORY B2:

Rooms for short-term stay (including entrance halls, reception area with waiting area, exhibition halls or ticket halls)
– $A/V \geq 0.15$

ROOM CATEGORY B3:

Rooms for long-term stay (including restaurants, bedrooms and treatment rooms, libraries or sales rooms)
– $A/V \geq 0.20$

ROOM CATEGORY B4:

Workrooms (including reception and counter areas, resident rooms in care facilities, single and multi-person offices)
– $A/V \geq 0.25$

ROOM CATEGORY B5:

Rooms with special requirements for noise reduction and room comfort (including canteens in schools, day nurseries, hospitals and nursing homes, workshops / workrooms and canteen kitchens, exercise rooms and play corridors in day-care centres)
– $A/V \geq 0.30$

Planning aid in practice

The following planning example of a restaurant in Barcelona shows how you can easily determine not only the A/V ratio, but also the minimum sound absorption coefficient.

Project-related (RG B3), the determination of the necessary A / V ratio is carried out either via the formula $A / V \geq [3.13 + 4.69 \lg (h / 1m)] - 1$ with h as the room height in metres or based on Table 6 of the previous version of DIN 18041: 03-2016 using a simple dimension table (Table page 1: existing areas are not taken into account in the table, but can be offset).

The required area is specified as a percentage of the available area. For the restaurant with approx. 120 m² (L x W: 13 x 9 m) and a room height of approx. 5.0 m, the entire ceiling area (1.0 = 100% of the area) should be installed with a suitably selected material with an absorption coefficient of 0.50. If the area installed is smaller, the requirement for the material or the system increases accordingly.

An installed area of 70% (0.7), corresponding to 84 m², leads to an increased absorption coefficient of 0.75.

For room heights above 2.5 m, either the minimum area must be increased by a corresponding correction value (height 5.0 m - correction value 1.56) or compensated for with higher quality material / system.

Selected acoustic measures on perimeter surfaces in the Restaurant Bellavista example:

- Available area: 120 m² (=100%)
- Minimum sound absorption coefficient ap
= absorption coefficient from table x correction value (5.0 m)
= 0.50 x 1.56 = 0.78 = 0.80
- For the planning example, the following Knauf AMF products would be used:

HERADESIGN® *superfine* 25 mm + 40 mm acoustic overlay (CNF Board D5) with a total construction height of 85 mm gives an absorption coefficient of 0.85 at 250 Hz.



DO YOU STILL HAVE QUESTIONS?

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