

# INTRODUCTION

- The KLH® standard components provide a quick overview of common component variants in solid wood construction.
- Each wall construction is available in the following variants:  
**Visible / G (plasterboard) / RP (resilient profile) / FF (facing formwork) / FF free 2\*G (facing formwork, self supporting, double planked).**
- Each ceiling structure is available in the following variants:  
**Visible / G (plasterboard) / RP (resilient profile) / SC (suspended ceiling) / SC 2\*G (suspended ceiling, double planked).**
- Particular attention was paid to comparability and quick customization options.
- All superstructures provide the most important data on the following properties:

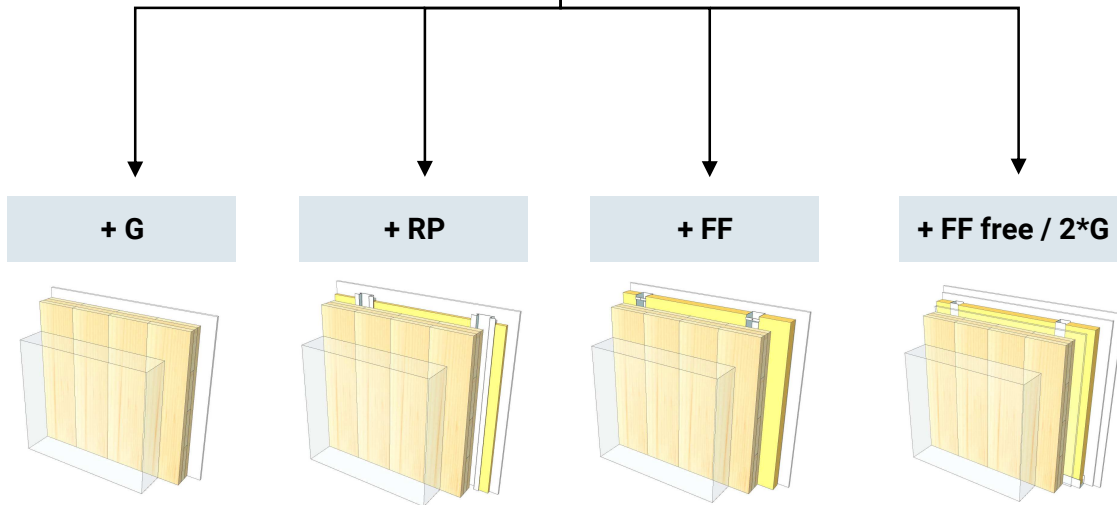
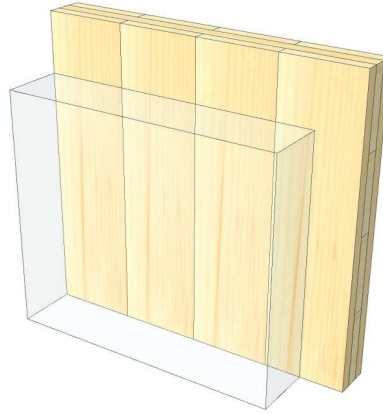
<b>Fire protection</b>	R*EI [min]
<p>The fire protection refers to the base panels and their improvements covered in the KLHdesigner.</p> <p>* The R criterion is to be verified via the residual load-bearing capacity of the remaining cross-section.</p>	
<b>Thermal insulation</b>	U [W/m²K]
<p>The U-value was calculated using the specified material thicknesses and the material parameters provided online.</p> <p>A comprehensive thermal insulation analysis can be accessed via the link provided (Ubakus).</p>	
<b>Sound insulation</b>	Rw / Ln,w [dB]
<p>The sound insulation was calculated on the basis of conducted and comparable tests.</p> <p>The improvements were always added conservatively, depending on the frequency, and adapted on the basis of comparable tests.</p>	
<b>Ecology</b>	[kg CO <sub>2</sub> eq./m²]
<p>The ecological data refer to the overall structure with the materials stored online. Individual material data can be accessed via the link (Ubakus)</p>	

# ENHANCEMENTS

## WALL

## KLH® Visible

For walls applies the **3s 100 TT (30/40/30)** as the basic panel. The exception are the additionally listed interior wall types.



[mm]  
 KLH® - CLT 3s  
 12,5 Gt-F board

[mm]  
 KLH® - CLT 3s  
 30,0 Resilient profile  
 20,0 Mineral wool  
 12,5 Gt-f board

[mm]  
 KLH® - CLT 3s  
 60,0 CW - profile,  
 elast. clips  
 50,0 Mineral wool  
 15,0 Gt-F board

[mm]  
 KLH® - CLT 3s  
 10,0 Air gap  
 60,0 CW - profile, self  
 supporting  
 50,0 Mineral wool  
 12,5 Gt-F board  
 12,5 Gt-F board

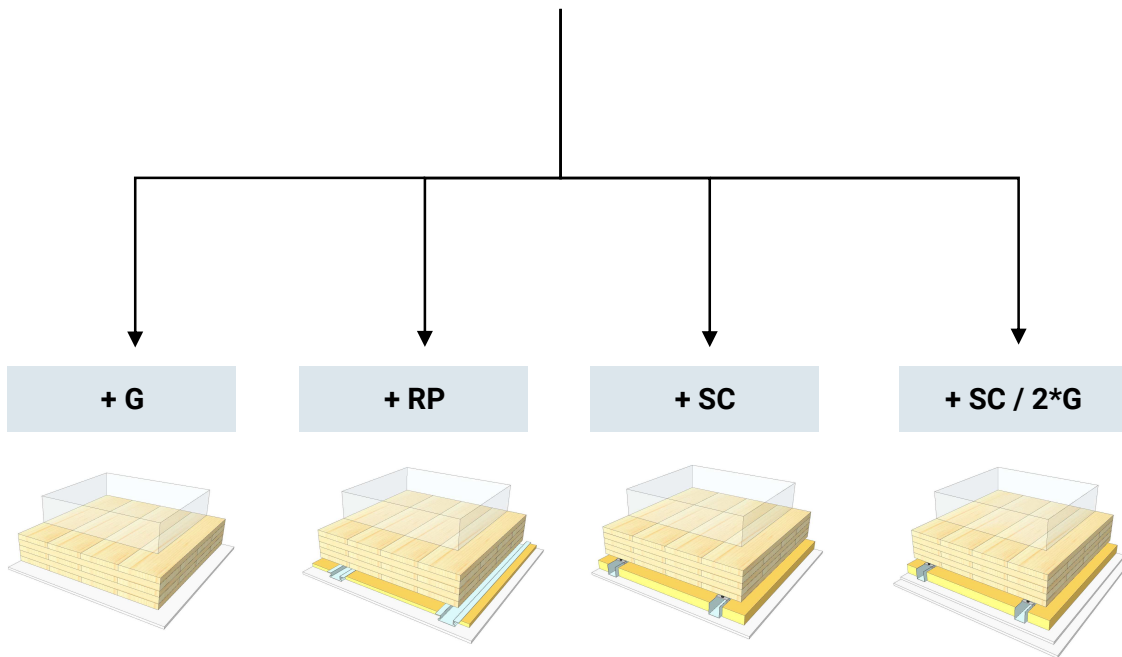
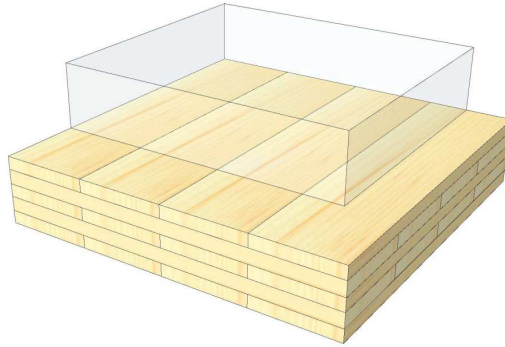
# ENHANCEMENTS

## FLOOR / ROOF

## KLH® Visible

For floors applies the  
**5s 160 TL**  
**(40/20/40/20/40)**  
as the basic panel

For roofs applies the  
**5s 120 TL**  
**(30/20/20/20/30)**  
as the basic panel



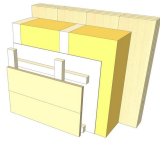
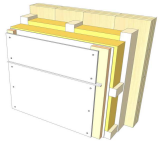
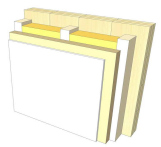
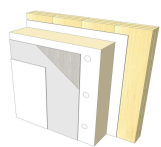
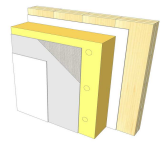
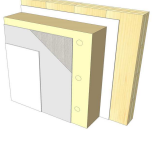
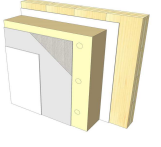
[mm]  
KLH® - CLT 5s  
12,5 Gt-F board

[mm]  
KLH® - CLT 5s  
30,0 Resilient profile  
20,0 Mineral wool  
12,5 Gt-F board





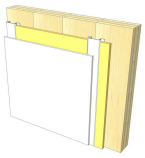
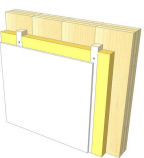
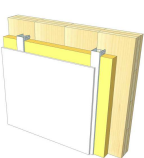
[mm]  
KLH® - CLT 5s  
60,0 CD - profile  
50,0 Mineral wool  
12,5 Gt-F board

[mm]  
KLH® - CLT 5s  
60,0 CD - profile,  
elast. clips  
50,0 Mineral wool  
12,5 Gt-F board  
12,5 Gt-F board

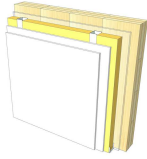
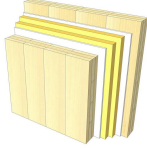
# EXTERIOR WALL

		KLH® Visible	+ G	+ RP	+ FF	+ FF free / 2*G	
<b>Ventilated timber facade</b>							
AW 01		Sound $R_w$ [dB]	44	45	52	55	63
		Thermal $U$ [W/m <sup>2</sup> K]	0,17	0,17	0,16	0,14	0,14
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	391	403	430	463	476
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-89	-87	-85	-81	-80
<b>Ventilated facade panel</b>							
AW 02		Sound $R_w$ [dB]	53	54	58	60	66
		Thermal $U$ [W/m <sup>2</sup> K]	0,17	0,17	0,16	0,14	0,14
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	343	355	382	418	428
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-46	-44	-42	-37	-37
<b>Plaster baseboard</b>							
AW 03		Sound $R_w$ [dB]	48	49	54	55	63
		Thermal $U$ [W/m <sup>2</sup> K]	0,19	0,18	0,17	0,15	0,15
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	325	338	365	398	410
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-53	-51	-47	-44	-42
<b>EPS - ETICS</b>							
AW 04		Sound $R_w$ [dB]	36	37	45	47	56
		Thermal $U$ [W/m <sup>2</sup> K]	0,15	0,15	0,14	0,13	0,13
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	311	324	351	384	396
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-39	-36	-33	-29	-29
<b>Mineral wool - ETICS</b>							
AW 05		Sound $R_w$ [dB]	41	42	46	48	60
		Thermal $U$ [W/m <sup>2</sup> K]	0,15	0,15	0,14	0,13	0,13
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	311	324	351	384	396
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-37	-34	-31	-28	-27
<b>Wood fiber - ETICS</b>							
AW 06		Sound $R_w$ [dB]	39	40	45	48	59
		Thermal $U$ [W/m <sup>2</sup> K]	0,17	0,17	0,16	0,14	0,14
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	311	324	351	386	396
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-86	-84	-81	-77	-77
<b>Hemp - ETICS</b>							
AW 07		Sound $R_w$ [dB]	54	55	57	59	67
		Thermal $U$ [W/m <sup>2</sup> K]	0,18	0,18	0,16	0,15	0,14
		Fire $R^*E_I$ [min]	30	60	60	90	90
		Thickness [mm]	311	324	351	386	396
		Ecology [kg CO <sub>2</sub> eq./m <sup>2</sup> ]	-51	-48	-45	-41	-41

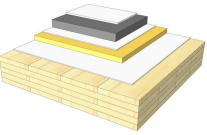
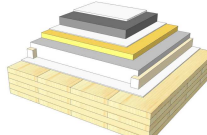
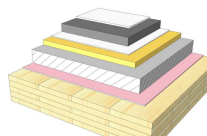
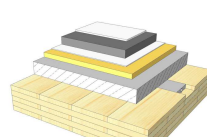
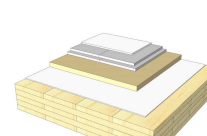
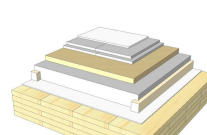
# INTERIOR WALL

		KLH® Visible	+ G	+ RP	+ FF	+ FF free / 2*G	
<b>KLH® 3s 60</b>							
IW 01		Sound Rw [dB]	29	30	38	40	49
		Thermal U [W/m²K]	1,32	1,24	0,76	0,53	0,50
		Fire R*EI [min]	0	0	0	0	0
		Thickness [mm]	60	73	100	135	145
		Ecology [kg CO2 eq./m²]	-36	-34	-30	-26	-26
<b>KLH® 3s 100</b>							
IW 02		Sound Rw [dB]	33	34	44	47	59
		Thermal U [W/m²K]	0,91	0,87	0,60	0,45	0,43
		Fire R*EI [min]	30	30	30	30	30
		Thickness [mm]	100	113	140	175	185
		Ecology [kg CO2 eq./m²]	-60	-58	-54	-50	-50
<b>KLH® 5s 160</b>							
IW 03		Sound Rw [dB]	39	40	48	51	61
		Thermal U [W/m²K]	0,63	0,61	0,46	0,36	0,35
		Fire R*EI [min]	30	60	60	90	90
		Thickness [mm]	160	173	200	235	245
		Ecology [kg CO2 eq./m²]	-96	-94	-90	-86	-86
<b>Cladded</b>							
IW 04		Sound Rw [dB]	34	35	45	48	60
		Thermal U [W/m²K]	0,87	0,84	0,59	0,43	0,42
		Fire R*EI [min]	30	60	60	60	60
		Thickness [mm]	113	125	152	188	198
		Ecology [kg CO2 eq./m²]	-58	-55	-52	-48	-48
<b>Resilient profile</b>							
IW 05		Sound Rw [dB]	44	45	48	50	63
		Thermal U [W/m²K]	0,60	0,59	0,45	0,36	0,35
		Fire R*EI [min]	30	60	60	60	60
		Thickness [mm]	140	152	179	215	225
		Ecology [kg CO2 eq./m²]	-54	-52	-49	-44	-44
<b>Facing formwork timber battens</b>							
IW 06		Sound Rw [dB]	41	42	50	51	61
		Thermal U [W/m²K]	0,45	0,44	0,36	0,30	0,29
		Fire R*EI [min]	30	60	60	60	60
		Thickness [mm]	163	175	202	240	250
		Ecology [kg CO2 eq./m²]	-60	-57	-54	-49	-49
<b>Facing formwork CW-profiles</b>							
IW 07		Sound Rw [dB]	47	48	50	52	62
		Thermal U [W/m²K]	0,45	0,44	0,36	0,30	0,29
		Fire R*EI [min]	30	60	60	90	90
		Thickness [mm]	173	185	215	250	260
		Ecology [kg CO2 eq./m²]	-51	-48	-44	-40	-40

# INTERIOR WALL

		KLH® Visible	+ G	+ RP	+ FF	+ FF free / 2*G	
<b>Facing formwork self supporting</b>							
<b>IW 08</b>		<b>Sound</b> Rw [dB]	60	61	63	64	70
		<b>Thermal</b> U [W/m²K]	0,43	0,42	0,35	0,29	0,28
		<b>Fire</b> R*EI [min]	30	60	60	90	90
		<b>Thickness</b> [mm]	185	198	225	260	270
		<b>Ecology</b> [kg CO2 eq./m²]	-50	-48	-43	-38	-40
<b>Two layer KLH® 3s 100</b>							
<b>IW 09</b>		<b>Sound</b> Rw [dB]	62	64	68	69	73
		<b>Thermal</b> U [W/m²K]	0,26	0,25	0,22	0,20	0,19
		<b>Fire</b> R*EI [min]	30	60	60	60	60
		<b>Thickness</b> [mm]	295	320	347	380	390
		<b>Ecology</b> [kg CO2 eq./m²]	-112	-107	-104	-100	-99

# COMPARTMENT FLOOR

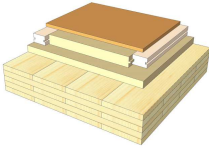
		KLH® Visible	+ G	+ RP	+ SC	+ SC / 2*G	
<b>Wet screed / no or light fill</b>							
GD 01		Airborne Rw [dB]	55	56	58	60	72
		Impact Ln,w [dB]	60	60	54	50	45
		Thermal U [W/m²K]	0,41	0,40	0,33	0,29	0,28
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	250	263	290	323	335
		Ecology [kg CO2 eq./m²]	-83	-80	-77	-75	-72
<b>Wet screed / heavy fill (loose or inserts )</b>							
GD 02		Airborne Rw [dB]	61	62	65	68	73
		Impact Ln,w [dB]	44	44	39	37	35
		Thermal U [W/m²K]	0,40	0,39	0,33	0,28	0,28
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	330	343	370	403	415
		Ecology [kg CO2 eq./m²]	-80	-78	-74	-72	-70
<b>Wet screed / bonded heavy fill (elastic or acoustic layer)</b>							
GD 03		Airborne Rw [dB]	59	60	62	68	74
		Impact Ln,w [dB]	46	46	41	39	37
		Thermal U [W/m²K]	0,40	0,39	0,32	0,28	0,28
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	336	349	376	409	421
		Ecology [kg CO2 eq./m²]	-72	-69	-66	-63	-61
<b>Wet screen / TCC / no fill</b>							
GD 04		Airborne Rw [dB]	66	67	69	72	81
		Impact Ln,w [dB]	46	46	40	38	36
		Thermal U [W/m²K]	0,36	0,36	0,30	0,26	0,26
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	330	343	370	403	415
		Ecology [kg CO2 eq./m²]	-65	-63	-59	-57	-55
<b>Dry screed / no or light fill</b>							
GD 05		Airborne Rw [dB]	55	56	58	60	70
		Impact Ln,w [dB]	61	61	56	51	46
		Thermal U [W/m²K]	0,42	0,42	0,35	0,30	0,29
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	215	228	255	288	300
		Ecology [kg CO2 eq./m²]	-93	-91	-88	-85	-83
<b>Dry screed / heavy fill (loose or inserts )</b>							
GD 06		Airborne Rw [dB]	61	62	64	65	72
		Impact Ln,w [dB]	54	54	50	46	43
		Thermal U [W/m²K]	0,42	0,41	0,34	0,29	0,29
		Fire R*EI [min]	90	120	120	120	120
		Thickness [mm]	295	308	335	368	380
		Ecology [kg CO2 eq./m²]	-91	-88	-85	-83	-80

# COMPARTMENT FLOOR

KLH® Visible	+ G	+ RP	+ SC	+ SC / 2*G
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## Wood planks / wood fiber system

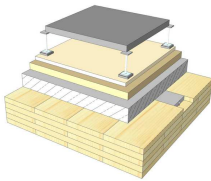
GD 07



<b>Airborne</b> Rw [dB]	53	54	56	58	70
<b>Impact</b> Ln,w [dB]	64	64	60	54	48
<b>Thermal</b> U [W/m²K]	0,25	0,25	0,22	0,20	0,20
<b>Fire</b> R*EI [min]	90	120	120	120	120
<b>Thickness</b> [mm]	280	293	320	353	365
<b>Ecology</b> [kg CO2 eq./m²]	-128	-125	-122	-119	-117

## Double floor / TCC

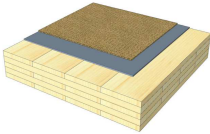
GD 08



<b>Airborne</b> Rw [dB]	61	61	63	64	78
<b>Impact</b> Ln,w [dB]	47	47	42	39	37
<b>Thermal</b> U [W/m²K]	0,32	0,31	0,27	0,24	0,24
<b>Fire</b> R*EI [min]	90	120	120	120	120
<b>Thickness</b> [mm]	468	481	508	541	553
<b>Ecology</b> [kg CO2 eq./m²]	-79	-78	-73	-70	-68

## Carpet floor

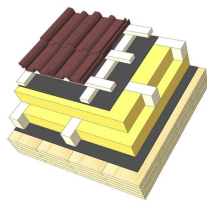
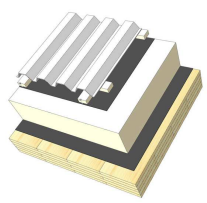
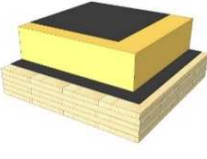

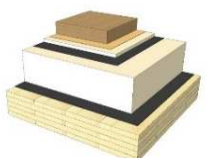
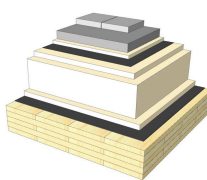
GD 09



<b>Airborne</b> Rw [dB]	35	36	45	55	57
<b>Impact</b> Ln,w [dB]	62	62	58	53	48
<b>Thermal</b> U [W/m²K]	0,56	0,54	0,43	0,35	0,35
<b>Fire</b> R*EI [min]	90	120	120	120	120
<b>Thickness</b> [mm]	175	188	215	250	260
<b>Ecology</b> [kg CO2 eq./m²]	-96	-94	-90	-87	-86



# ROOF

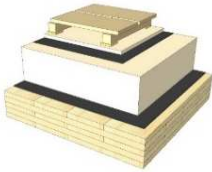
		KLH® Visible	+ G	+ RP	+ SC	+ SC / 2*G	
<b>Steep roof / tiles</b>							
DA 01		Airborne Rw [dB]	50	51	52	56	62
		Impact Ln,w [dB]					
		Thermal U [W/m²K]	0,14	0,14	0,13	0,12	0,12
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	504	517	544	577	589
		Ecology [kg CO2 eq./m²]	-91	-89	-85	-83	-80
<b>Steep roof / metal sheet</b>							
DA 02		Airborne Rw [dB]	50	51	52	55	59
		Impact Ln,w [dB]					
		Thermal U [W/m²K]	0,10	0,10	0,10	0,09	0,09
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	481	494	521	554	566
		Ecology [kg CO2 eq./m²]	-33	-31	-27	-25	-22
<b>Flat roof / mineral wool (or wood fiber)</b>							
DA 03		Airborne Rw [dB]	44	45	49	53	57
		Impact Ln,w [dB]					
		Thermal U [W/m²K]	0,16	0,16	0,15	0,14	0,14
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	332	345	372	405	417
		Ecology [kg CO2 eq./m²]	-20	-17	-14	-12	-9,2
<b>Flat roof / EPS</b>							
DA 04		Airborne Rw [dB]	36	37	45	51	56
		Impact Ln,w [dB]					
		Thermal U [W/m²K]	0,14	0,14	0,13	0,13	0,12
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	332	345	372	405	417
		Ecology [kg CO2 eq./m²]	-44	-42	-39	-36	-34
<b>Flat roof / greening</b>							
DA 05		Airborne Rw [dB]	47	48	53	56	62
		Impact Ln,w [dB]					
		Thermal U [W/m²K]	0,14	0,14	0,13	0,12	0,12
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	417	430	457	490	502
		Ecology [kg CO2 eq./m²]	-44	-42	-39	-36	-34
<b>Flat roof / concrete blocks</b>							
DA 06		Airborne Rw [dB]	55	56	58	60	70
		Impact Ln,w [dB]	49	49	45	42	39
		Thermal U [W/m²K]	0,12	0,12	0,11	0,10	0,10
		Fire R*EI [min]	60	60	60	60	90
		Thickness [mm]	487	500	527	560	572
		Ecology [kg CO2 eq./m²]	-40	-38	-34	-32	-30

# ROOF

KLH® Visible	+ G	+ RP	+ SC	+ SC / 2*G
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## Flat roof / wood terrace

DA 07



<b>Airborne</b> Rw [dB]	38	39	46	51	58
<b>Impact</b> Ln,w [dB]	62	62	57	52	46
<b>Thermal</b> U [W/m²K]	0,14	0,14	0,13	0,12	0,12
<b>Fire</b> R*EI [min]	60	90	90	90	90
<b>Thickness</b> [mm]	427	440	467	500	512
<b>Ecology</b> [kg CO2 eq./m²]	-69	-66	-63	-61	-58