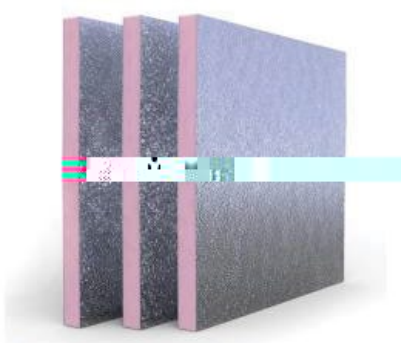




Journal of Architectural Engineering Technology

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Phenolic foam insulation

: Phenolic foam insulation.



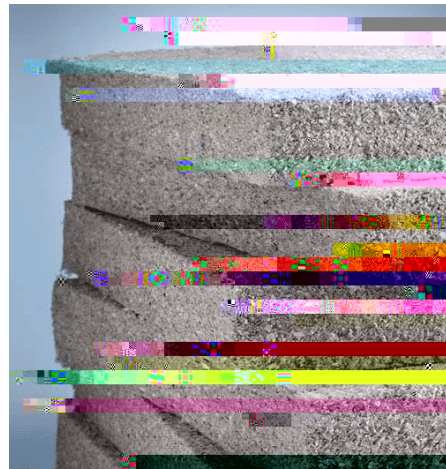
Mineral wool

: Mineral wool.

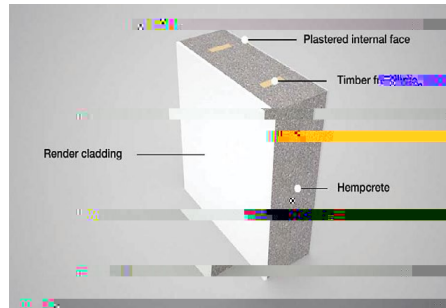


Fly ash-lime-gypsum blocks

: Mineral wool.



: Mineral wool.



Hempcrete.

& (, 2021)

The study by [Author] (2021) investigated the thermal and acoustic performance of a wall assembly incorporating hempcrete. The assembly consisted of an internal plastered face, a timber frame, render cladding, and a core of hempcrete. The results showed that the hempcrete core significantly improved the thermal insulation and sound absorption of the wall, making it a sustainable and effective building material.

Acoustic performance

The acoustic performance of the wall assembly was evaluated using sound absorption coefficients. The hempcrete core demonstrated a high absorption coefficient, particularly in the mid-frequency range, which is crucial for reducing noise in residential and commercial buildings. This finding supports the use of hempcrete as a sustainable acoustic insulation material.

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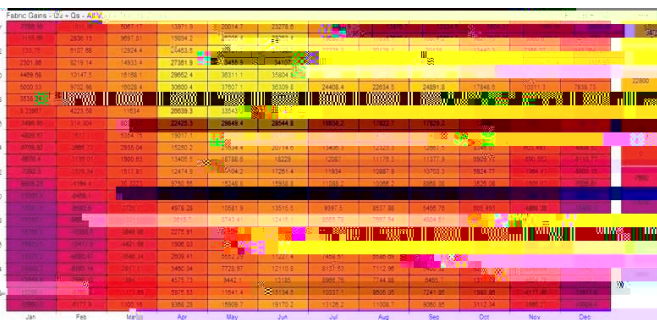


HOUR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00	-10998	-5213	923	8584	14870	18152	13113	8528	8177	7727	5512	10242
01	-12288	-6765	-130	8584	14870	18152	13113	8528	8177	7727	5512	10242
02	-13545	-7547	-1994	4037	8472	12168	7995	6748	5479	1081	-4694	-14528
03	-14961	-8774	-2871	2939	6818	9587	6535	5595	3672	134	-5681	-15919
04	-15953	-9569	-3568	2158	5715	10219	6535	5595	3672	134	-5681	-15919
05	-16970	-10404	-4451	1506	4758	9438	5963	5053	3060	-271	-6230	-17021
06	-16734	-10370	-3847	1057	5701	10097	6650	5687	3153	79	-5965	-16866
07	-16158	-9864	-3205	7057	7753	11448	7753	6587	3153	79	-5965	-16866
08	-16249	-9564	-2720	4373	9591	12541	8438	7574	4541	482	-4857	-15448
09	-13052	-6438	-1370	6499	11952	13654	9255	7574	4541	482	-4857	-15448
10	-9904	-4173	-252	8972	14296	14944	10108	8438	7574	4541	482	-4857
11	-7288	-2466	1057	11952	16249	15448	11448	9255	7574	4541	482	-4857
12	-5213	-5213	923	14870	18152	13113	8528	8177	7727	5512	10242	10242
13	-3500	-3500	314	22425	29849	28545	18858	17823	11770	12869	39619	-1831
14	-1994	-1994	4037	33456	41077	34107	23975	22558	15367	9486	3301	-3991
15	-10418	-10418	4422	27362	33456	34107	23975	22558	15367	9486	3301	-3991
16	-8766	-8766	2276	22762	28253	19681	17639	16864	9824	3361	-3991	-3991
17	-5582	-5582	3616	12416	8556	7668	805	351	-5976	-16899	-16899	-16899
18	-16282	-9582	-2726	4978	10582	13515	9398	8538	805	351	-5976	-16899
19	-15978	-9580	-3547	2609	6552	11227	7459	5587	4595	5681	-15942	-15942
20	-16935	-10418	-4422	1906	5554	10419	6877	6043	3910	-185	-6237	-17047
21	-16766	-10388	-3850	2276	6659	11071	7586	6674	4067	151	-5976	-16899
22	-16190	-9882	-3211	3616	8743	12416	8556	7668	805	351	-5976	-16899
23	-16282	-9582	-2726	4978	10582	13515	9398	8538	805	351	-5976	-16899

: Heat transfer through the walls of administrative block, Frank & Debbie Islam management complex, A.M.U using aerogel panels (Ecotect analysis 2011).

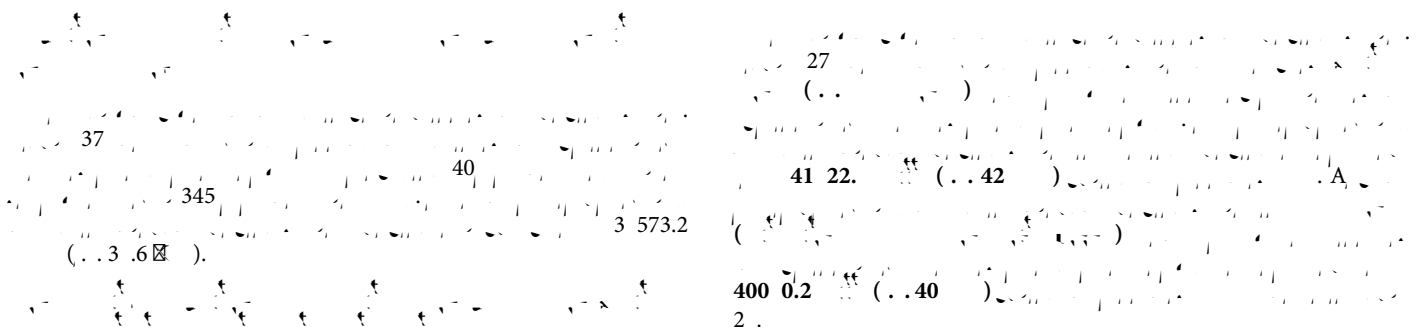
Specification	Description	Reference
Core Material	Polyurethane foam	Baskaran et al., 2019
Density	Typically 25-50 kg/m ³ for rigid panels and 30-50 kg/m ³ for spray foam	Spray Foam Magazine
Thickness	Usually available in 25-150 mm thicknesses for rigid panels and varying thicknesses for spray foam	Spray Foam Magazine
Panel Sizes	Varies by manufacturer, typically available in standard sizes up to 1.2m x 2.4m for rigid panels	Baskaran et al., 2019
Thermal Conductivity	Typically 0.02-0.03 W/mK for rigid panels and 0.03-0.04 W/mK for spray foam	Baskaran et al., 2019
Compressive Strength	Typically 150-300 kPa for rigid panels and 50-200 kPa for spray foam	Baskaran et al., 2019
Tensile Strength	Typically 100-200 kPa for rigid panels and 75-125 kPa for spray foam	Baskaran et al., 2019
Water Vapor Transmission Rate	Typically less than 5 ng/Pa·s·m ² for rigid panels and 0.5-2.5 ng/Pa·s·m ² for spray foam	Spray Foam Magazine
Max. Withstanding Temperature	Typically up to 80-90°C for rigid panels and 60-70°C for spray foam	Baskaran et al., 2019
Fire Performance	Usually Class B1 or B2 for rigid panels and Class B for spray foam	Baskaran et al., 2019
Usage in Building	Typically used for exterior wall insulation, roof insulation, and floor insulation	Baskaran et al., 2019
Energy-Saving Results	Highly effective for reducing heating and cooling loads in buildings	Baskaran et al., 2019

: Wall material details of administrative block, Frank & Debbie Islam management complex, A.M.U using polyurethane panels.



HOUR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00	-10990	-5178	1100	8584	14870	18152	13126	11009	9061	3112	-3565	-10924
01	-12295	-6766	-1174	8584	14870	18152	13126	11009	9061	3112	-3565	-10924
02	-13560	-7550	-1866	4037	8472	12168	7995	6748	5479	1081	-4694	-14528
03	-14961	-8774	-2871	2939	6818	9587	6535	5595	3672	134	-5681	-15919
04	-15953	-9569	-3568	2158	5715	10219	6535	5595	3672	134	-5681	-15919
05	-16970	-10404	-4451	1506	4758	9438	5963	5053	3060	-271	-6230	-17021
06	-16734	-10370	-3847	1057	5701	10097	6650	5687	3153	79	-5965	-16866
07	-16158	-9864	-3205	7057	7753	11448	7753	6587	3153	79	-5965	-16866
08	-16249	-9564	-2720	4373	9591	12541	8438	7574	4541	482	-4857	-15448
09	-13052	-6438	-1370	6499	11952	13654	9255	7574	4541	482	-4857	-15448
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23	-16282	-9582	-2726	4978	10582	13515	9398	8538	805	351	-5976	-16899

: Heat transfer through the walls of administrative block, Frank & Debbie Islam management complex, A.M.U using polyurethane panels (Ecotect analysis 2011).



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1. https://issuu.com/akarshan/docs/academic_dissertation_-_akarshan_chauhan_.docx
2. Corridor Budiati (2020) Building Material in the Perspective of Energy Efficiency