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ROCKWOOL Partition Wall System



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ROCKWOOL Group

We are the world leading stone wool manufacturer, with innovative products and systems, committed to protecting the environment and improving people's life.

ROCKWOOL Group is a global leader in thermal insulation, providing world-class products and solutions to building structures. Our products help secure fire safety and reduce energy consumption of buildings, coupled with excellent performance in sound absorption, noise reduction and indoor comfort. ROCKWOOL provides green solutions for the horticulture industry, special engineered stone wool fiber for the manufacturing industry, as well as effective insulation solutions for refining and processing industries, marine and offshore industries and other areas. We also have acoustic and vibration reduction system for modern infrastructure construction.

ROCKWOOL Group has a major market share in Europe, but we have also actively expanded our market in Russia, North America, India and East Asia, with more production, sales and service activities operating locally. ROCKWOOL Group's global network helps promote our products and systems around the world.

In China, ROCKWOOL provides a wide range of products for building insulation and other industrial areas that cater to different applications. We have more than 20 years of exploration and operation in China. ROCKWOOL stone wool is integrated with several excellent strengths: fire resilience, thermal properties, acoustic capabilities, durability and sustainability etc. Our products can stand the test of time. They protect buildings and people in any environment while reducing the carbon footprint. ROCKWOOL protects the environment and makes our society develop with a more sustainable approach.

ROCKWOOL China has an annual stone wool production capacity of 110,000 tons in Guangzhou and Yangzhou, and subsidiaries located in Beijing, Guangzhou, Hong Kong, Taiwan, Philippines and other major cities at present.

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Manufacturing facilities

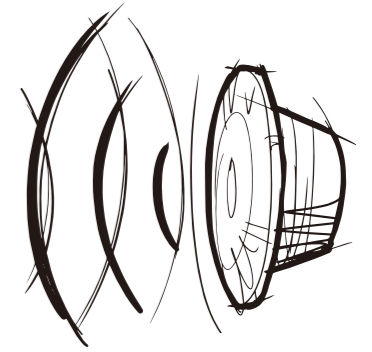
100+

Countries sales coverage

11,000+

Employees globally

Functional requirements



Fire performance and acoustic insulation

The amount of noise is increasing with social development and growing population. It is common that people often get disturbed by noise. One popular way to isolate noise is to install partition walls. Partition wall has evolved from single function to multi-function, from being just used to separate spaces to being versatile with features such as fire prevention, sound isolation, humidity resistance and thermal insulation. Among various partition wall systems, light-steel frame partition wall is one that has been widely used for its excellent sound isolation, light weight and quick installation. Even though it is very effective in isolating mid-to-high frequency noise, its performance regarding low-frequency noise may not be satisfactory. Such noise is likely to come from elevators, water pumps, electrical equipment, which now sees an increasing trend. ROCKWOOL partition wall solution uses the latest ROCKWOOL AS-DD/DD Plus or TR-S60 ECO/S80 ECO stone wool slabs, providing an all-round sound isolation regardless of frequencies. This solution works especially well against low-frequency noise, coupled with remarkable fire performance, humidity resistance, thermal insulation, etc.

Fire performance

Fire performance of partition walls is at the core of efforts to ensure the safety of people and buildings. China's Code for Fire Protection Design of Buildings (GB/50016-2014) set forth the basic requirements on combustion performance and fire resistance of partition walls in buildings with different fire ratings. In a light steel frame wall system, stone wool and other filling materials are necessary for meeting different fire resistance requirements.

Fire performance for building components with different fire ratings (h)

Components	Fire resistance			
	Class I	Class II	Class III	Class IV
Firewall	Non-combustibility 3.00	Non-combustibility 3.00	Non-combustibility 3.00	Non-combustibility 3.00
Wall of staircase and front room				
Elevator shaft wall	Non-combustibility 2.00	Non-combustibility 2.00	Non-combustibility 1.50	Non-combustibility 0.50
Partition wall between different units				
Partition wall of two sides along evacuation route	Non-combustibility 1.00	Non-combustibility 1.00	Non-combustibility 0.50	Non-combustibility 0.25
Room partition wall	Non-combustibility 0.75	Non-combustibility 0.50	Non-combustibility 0.50	Non-combustibility 0.25

Not all stone wool can be used as fire-proof filling material for light-steel keel wall. ROCKWOOL stone wool product has small shrinkage at high temperature and high fire resistance. As UL approved product, they are ideal filling material for light steel frame partition wall.



ROCKWOOL partition wall system can extend the fire resistance of the whole system to 3-4 hours, catering for different requirements on fire performance.

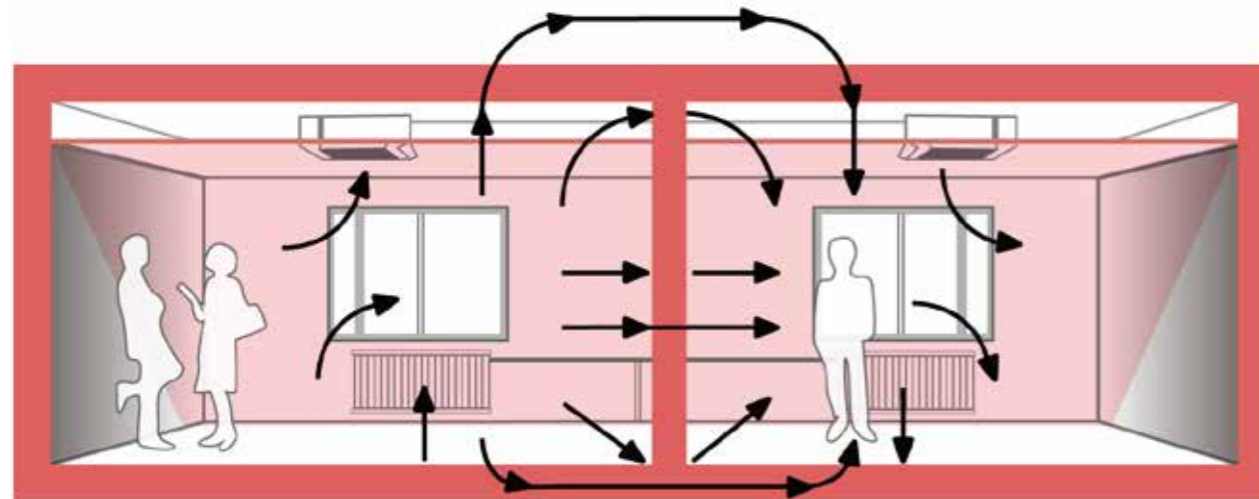
Acoustic performance

Noise interrupts people's rest, study and work, causing undesirable impacts on living and working environment. Chinese government stipulated a series of standards to reduce noise pollution and secure a sound living environment, and set forth the basic requirements for building sound insulation.

Standards of sound insulation for room walls and floor slabs (Hotels) (GB/50118-2010)

Component	Single number quantity + spectrum adaptation term for airborne sound insulation	Special Class	Class I	Class II
Partition wall and floor between rooms	Rw+C	>50	>45	>40
Wall around staircase and front room Elevator hoistway wall Partition wall between room and corridor	Rw+C	>45	>45	>40

They are the very basic requirements for noise control, not taking into account low-frequency noise. Low-frequency noise is the noise below 200 Hz, such as transport noise from automobile engine, vibrating noise from transformer and wall-mounted air conditioner, as well as noise from working booster pump, cooling refrigerator, elevator in operation, tapping keyboard and phone vibration. As development goes on, low-frequency noise is becoming a headache for cities, with people having more complaints regarding this problem. Long exposure to low-frequency noise will pose threats to people's hearing and cardiovascular system where expectant women and their babies are vulnerable to many negative influences. However, low-frequency noise makes isolation harder than high-frequency one due to its longer length of wave and transmission, stronger penetration and less energy loss. Common lightweight partition wall has limited ability to insulate such low-frequency sound due to its light and soft wall board, its filling material with the same problem. Their performance in low-frequency noise insulation is often far from satisfactory. People now have higher standards for their living environment, and that's why noise control has become a must, especially over low-frequency noise.



Indoor noise transfer

Stone wool is often seen in partition wall system for its excellent performance in fire protection and sound insulation. ROCKWOOL provides two sound stone wool products for partition wall system, one is ROCKWOOL Acoustic DD/DD Plus, which has excellent acoustic property, and the other is Thermalrock ECO products with a high eco-friendly property. Client can select according to specific needs.

ROCKWOOL Acoustic DD/DD plus

ROCKWOOL AS-DD/DD Plus, an innovation by ROCKWOOL, is tailored to partition wall system. Stone wool is made from basalt and other natural stones. These materials begin with the fusion at a temperature of 1450°C, and the wool is produced in the spinning chamber. The wool goes through pendulum system and comes out as slabs with unique inhomogeneous structure. The products have better acoustic insulation performance, especially for low frequency noise. If combine with other construction measures, the acoustic insulation of the whole system can be further improved to meet different requirements.



Benefits:

- Class A non-combustible material, enduring a temperature of no lower than 1000°C;
- Unique inhomogeneous structure, better sound isolation and absorption, especially effective for low-frequency noise coming from elevators, appliances and pumps;
- Good water repellence, protecting the system from humidity;
- High strength, easy construction;
- Non-flammable, no toxic smoke or gas, safe to use;
- Low shot content, thin fiber, less skin irritation, no asbestos contained, no harm;
- High dimensional stability, stable at a high temperature;
- Excellent air permeability, no corrosion on metal and building components;
- Good physical and chemical stability;
- No blowing agent and flame retardant needed for production, widely recognized sustainability

Technical Parameters

Item	Unit	ROCKWOOL AS-DD	ROCKWOOL AS-DD Plus	Standard
Nominal density	kg/m ³	≤65	≤100	GB/T 5480
NRC	-		0.95	GB/T 20247
Rw(system)*	dB		45-60	GB/T 19889.3
Fire Performance	-	A (A1) Class Non-combustible		GB 8624
Thermal conductivity	W/ (m.k)	≤0.036		GB/T 10295
tensile strength of top layer (vertical to surface)	kPa	≥2.5	≥10	GB/T 25975
Acid Ratio	-	≥1.8		GB/T 1549
Water Repellence	%	≥99		GB/T 10299
Water Absorption (Partial Immersion, 24h)	kg/m ²	≤0.5		GB/T 30805
Water Absorption (Partial Immersion, 28d)	kg/m ²	≤1.5		GB/T 30807
Humidity Absorption Rate	%	≤0.5		GB/T 5480

*Acoustic performance varies by system structure and material

Standard Size

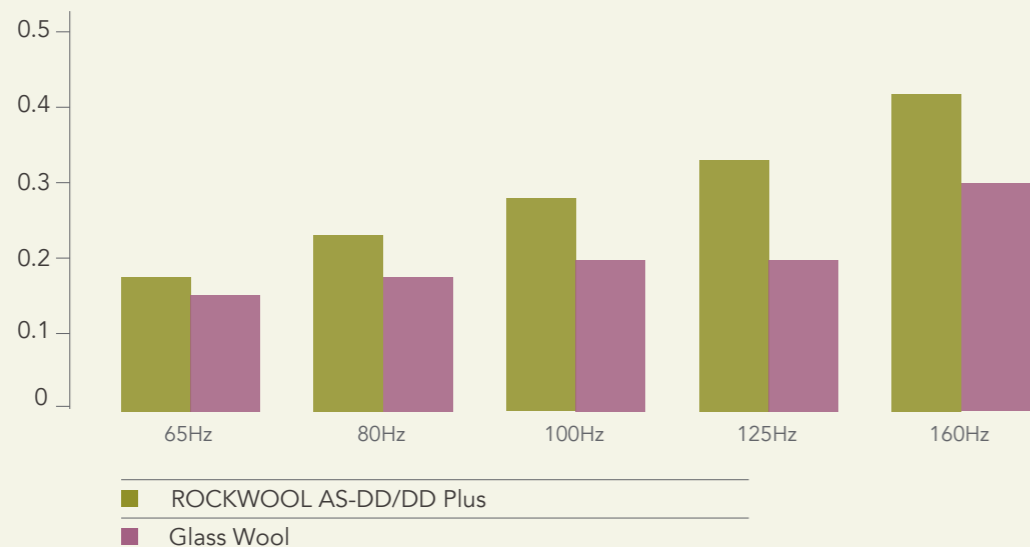
Code	Thickness (mm)	Size (mm)
ROCKWOOL Acoustic DD/DD Plus	50-150	1200×600

ROCKWOOL AS-DD/DD Plus vs. Other Acoustic Insulation Materials

Item	ROCKWOOL AS-DD/DD Plus	Common stone wool	Slag wool	Glass wool
Acoustic performance	Inhomogeneous structure, a combination of heavy and light panels, better sound isolation and absorption, especially against low-frequency sound (e.g. noise from elevators, pumps, washing machines and air conditions)	Average performance in sound isolation and absorption, less effective to low-frequency sound	Average performance in sound isolation and absorption, less effective to low-frequency sound	Average performance in sound isolation and absorption, less effective to low-frequency sound
Fire resistance	Small shrinkage at a high temperature, catering for different needs of partition wall on fire resistance limit, applicable to fire wall	Catering for different needs of partition wall on fire resistance limit, applicable to fire wall	Catering for different needs of partition wall on fire resistance limit, not applicable to fire wall	Expansion at a high temperature, not applicable to fire wall
Tensile strength (vertical to surface)	High	Low	Low	Low
Applicable temperature	Over 750°C	Over 750°C	Below 350°C	Below 350°C
Water repellence	Higher than 99.5%, good water repellence and durability	Mostly not water repellence in partition wall	Mostly not water repellence	Mostly not water repellence
Corrosion	No corrosion on metal components and pipes of partition wall system	Normally no corrosion on metal components and pipes of partition wall system	Subject to corrosion on metal components and pipes in partition wall system	Normally no corrosion on metal components and pipes of partition wall system
Environmental protection	No asbestos, no cancerogen	Normally no asbestos, no cancerogen	Uncertain	Normally no asbestos no cancerogen
Long-term performance	High strength, not easy to fall, sustained acoustic performance and fire protection	Not easy to fall, sustained acoustic performance and fire protection	Poor acoustic performance and fire protection in the long run	Low strength, easy to fall, poor acoustic performance and fire protection in the long run

ROCKWOOL AS-DD/DD Plus vs. Glass Wool (Sound Absorption Coefficient)

Sound Absorption Coefficient



ThermalRock ECO

ThermalRock S60 ECO/S80 ECO are specially developed for partition wall system, in addition to excellent fireproofing and acoustic insulation performance, they are produced with unique formaldehyde control process that meets CDPH standard and therefore have higher environmental performance.

Benefits

- Class A non-combustible material, enduring a temperature of no lower than 1000°C;
- Formaldehyde meets the requirements of the CDPH standard;
- Low shot content, thin fiber, less skin irritation, no asbestos contained, no harm;
- No blowing agent and flame retardant needed for production, widely recognized sustainability
- Good water repellence and air permeability, protecting the system from humidity;
- Non-flammable, no toxic smoke or gas, safe to use;
- High dimensional stability, stable at a high temperature;

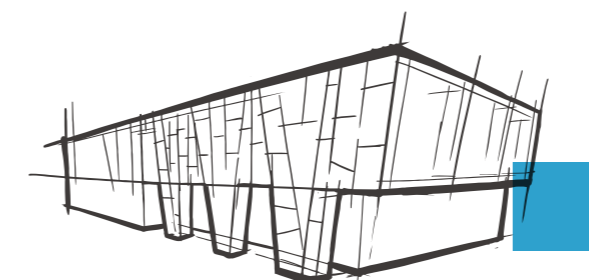


Technical Parameters

Item	Unit	TR-S60 ECO	TR-S80 ECO	Standard
Nominal density	kg/m ³	60	80	GB/T 5480
Fire Performance	-	A (A1) Class Non-combustible		GB 8624
Thermal conductivity	W/ (m.k)	0.034		GB/T 10295
Acid Ratio	-	≥1.8		GB/T 1549
Water Repellence	%	≥99		GB/T 10299
Water Absorption (Partial Immersion, 24h)	kg/m ²	≤0.5		GB/T 30805
Water Absorption (Partial Immersion, 28d)	kg/m ²	≤1.5		GB/T 30807
Humidity Absorption Rate	%	≤0.5		GB/T 5480

Standard Size

Code	Thickness (mm)	Size (mm)
TR-S60 ECO/TR-S80 ECO	50-150	1200 X 600

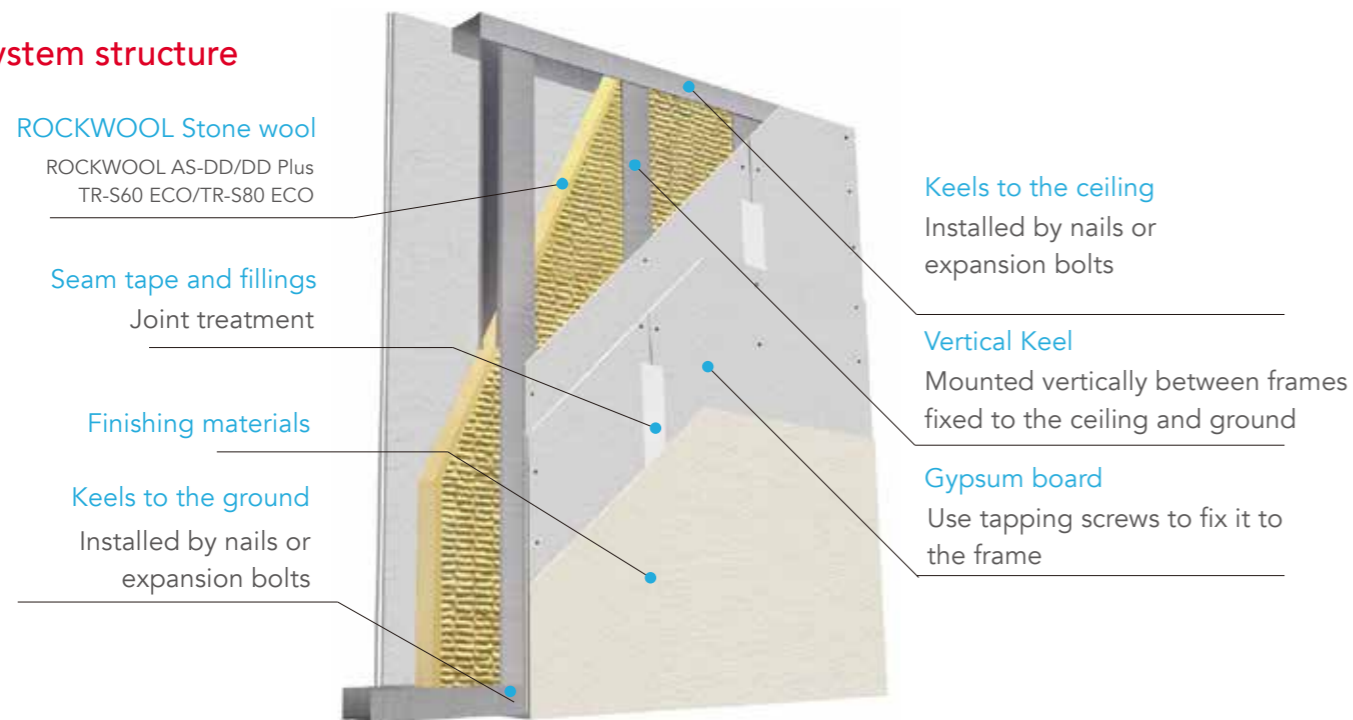


ROCKWOOL Partition Wall System

An environmentally friendly partition wall solution with excellent acoustic and fire performance

ROCKWOOL partition wall solution is a non-load-bearing system where gypsum or calcium silicate boards are fixed into the light-steel frame between which stone wool is filled. This solution can be applied for partitions, firewalls, soundproof walls and shaft walls in hotels, business centers, convention centers, office buildings, industrial plants and residential buildings.

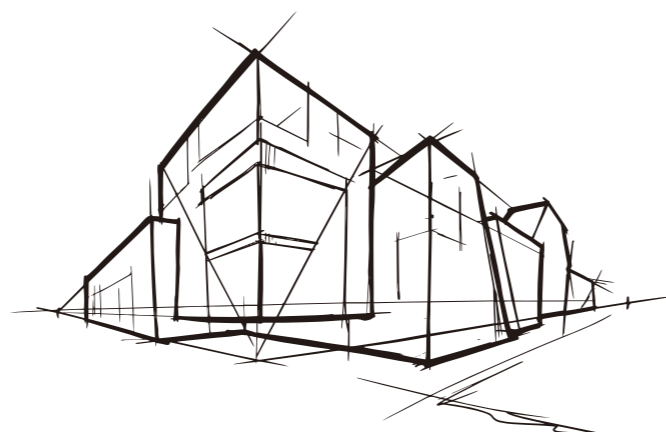
System structure



Benefits

ROCKWOOL partition wall solution is a non-load-bearing system where gypsum or calcium silicate boards are fixed into the light-steel frame between which stone wool is filled. This solution filled with ROCKWOOL Acoustic DD/DD Plus or ThermalRock S60 ECO/S80 ECO, can be applied for partitions, firewalls, soundproof walls and shaft walls in hotels, business centers, convention centers, office buildings, industrial plants and residential buildings.

- Excellent fire performance, up to 3-4h;
- Environmentally friendly and it meets the requirements of CDPH standard with a higher environmental performance when filled with TR-S60 ECO/TR-S80 ECO.
- Using ROCKWOOL Acoustic DD/DD Plus, the acoustic performance is better, given the same system, especially effective against low-frequency noise, enhanced sound isolation when used together with vibration reducing keel or other structures, able to meet different needs;
- Good water repellence and air permeability, no corrosion on light steel frame or other metal components, durable system;
- Solutions tailored to client's requirements.



System components

The main components of ROCKWOOL partition wall solution include ROCKWOOL AS-DD/DD Plus, keels, gypsum or calcium silicate boards etc., which are decided upon design.

Stone wool (GB/T 19686)

Product	Code	Nominal density (kg/m ³)	Thickness (mm)	Size (mm)
ROCKWOOL AS-DD/DD Plus	ROCKWOOL AS-DD	≤65	50-150	1200×600
	ROCKWOOL AS-DD Plus	≤100		
Thermalrock ECO	TR-S60 ECO	60	50-150	1200×600
	TR-S80 ECO	80		

Standard Keel

Type	Profile size (mm)			Application	Sectional view
	Width	Flange	Thickness		
U keel (horizontal)	75	40	0.6	Connections for walls and building structures, used to fix vertical keels under or on the floor	
	100	40	0.6		
U keel with longer flange (horizontal)	75	70	0.6	Used in places of which top may allow deviation	
	100	70	0.6		
C keel (vertical)	75	50	0.6	Major load bearing component of the wall, serving as the frame to hold plaster boards, vertically standing between two horizontal keels	
	100	50	0.6		
CH keel	75	35	0.8	Mostly used for shaft walls, inner plaster boards installed in the open space of H keel	
	100	35	0.8		
	150	35	1.0		

Gypsum Board (GB/T 9775)

Type	Size (mm)			Application
	Length	Width	Thickness	
Ordinary gypsum board	3000	1200	9.5, 12.0, 15.0	For partition wall with no special requirement
Water-resistant gypsum board	3000	1200	9.5, 12.0, 15.0	For bathroom, kitchen or lining board
Fire-resistant gypsum board	3000	1200	12.0, 15.0	For places required high fire resistance
Pipe shaft board	1200	2400	25.0	Suitable for shaft wall

Calcium silicate board (JC/T 564.1)

Type	Nominal size (mm)		
	Length	Width	Thickness
Length	500-3600 (500, 600, 900, 1200, 2400, 2440, 2980, 3200, 3600)		
Width	500-1250 (500, 600, 900, 1200, 1220, 1250)		
Thickness	4, 5, 6, 8, 9, 10, 12, 14, 16, 18, 20, 25, 30, 35		

Main structure and performance

Type	Description	Diagram	keel width (mm)	Fire resistance (h)	Weighted sound reduction index(dB)	
					AS-DD/DD Plus	TR-S60/80 ECO
Interior partition wall (firewall included)	Single row of C keels, with twin-skin, double-layer 12mm ordinary gypsum boards		75	≥1.5	≥50	≥48
			100	≥1.5	≥50	≥48
	Single row of C keels, with twin-skin, double-layer 12mm fire-resistant gypsum boards		75	≥2	≥50	≥48
			100	≥2	≥50	≥48
	Single row of C keels, with twin-skin, three-layer 12mm fire-resistant gypsum boards		75	≥3	≥50	-
			100	≥3	≥55	-
	Single row of C keels, with twin-skin, four-layer 12mm fire-resistant gypsum boards		100	≥4	≥55	-
	Single row of C keels, with twin-skin, double-layer 15mm ordinary gypsum boards		75	≥1.75	≥50	≥48
			100	≥1.75	≥50	≥48
	Single row of C keels, with twin-skin, double-layer 15mm fire-resistant gypsum boards		75	≥2.5	≥50	-
			100	≥2.5	≥50	-
	Single row of C keels, with twin-skin, three-layer 15mm fire-resistant gypsum boards		100	≥3.5	≥55	-
Soundproof wall	Double rows of C keels, with twin-skin, double-layer 12mm ordinary gypsum boards		75	≥1.5	≥60	≥58
			100	≥1.5	≥60	≥58

Main structure and performance

Type	Description	Diagram	keel width (mm)	Fire resistance (h)	Weighted sound reduction index(dB)	
					AS-DD/DD Plus	TR-S60/80 ECO
Soundproof wall	Double rows of C keels, with twin-skin, double-layer 12mm fire-resistant gypsum boards		75	≥2	≥60	≥58
			100	≥2	≥60	≥58
	Double rows of C keels, with twin-skin, three-layer 12mm fire-resistant gypsum boards		100	≥3	≥60	-
	Double rows of C keels, with twin-skin, double-layer 15mm ordinary gypsum boards		75	≥1.75	≥60	≥58
			100	≥1.75	≥60	≥58
	Double rows of C keels, with twin-skin, double-layer 15mm fire-resistant gypsum boards		75	≥2.5	≥60	≥58
			100	≥2.5	≥60	≥58
	Double rows of C keels, with twin-skin, three-layer 15mm fire-resistant gypsum boards		100	≥3.5	≥60	-
Shaft wall	Single row of CH keels, with 25mm core boards and double-layer 12mm fire-resistant gypsum boards		100	≥2	≥50	≥48
	Single row of CH keels, with 25mm core boards and double-layer 15mm fire-resistant gypsum boards		100	≥2.5	≥50	-

Note:

- ROCKWOOL AS-DD/DD Plus or TR-S60 ECO/TR-S80 ECO is recommended for partition wall system of which fire resistance is 1~2h;
- ROCKWOOL Acoustic DD Plus is recommended for partition wall system of which fire resistance is 3-4h;
- Vibration reducing keel or soundproof gypsum board could be used to meet higher soundproof requirements;
- This table shows gypsum board solutions, calcium silicate board or other types of board are available upon the need of project;
- This table shows solutions that are widely applied. Please contact ROCKWOOL Technical Support Team for other requirements.