

ELEPHANT
Gypsum Board

Wall Selector

Partition System by Elephant Gypsum Board



Partition System by Elephant Gypsum Board

Elephant Drywalls



At the present, the construction industry is facing a severe shortage of skilled labor, which has resulted in a dramatic increase in the cost of skilled labor. The demand for skilled masonry labor is a great representation of these issues. As a result, brick manufacturers have developed brick walls for sale in order to solve the skilled labor shortage. However, some common issues associated with using brick walls remain in place. These problems include wall surface cracks, joint cracks in the brick wall caused by the movement of the building structure, and inability to reconfigure the original building due to the weight of brick walls, which require extra structural rigidity and beam.

Elephant Wall System is the ideal solution for designing a flexible building without a surface problems or joint cracking, and it requires less labor and therefore can shorten the wall's construction time.

Elephant Wall System, each system is designed based on engineering principles and also has passed international standard tests in sound-proofing, fireproofing performance, and wall strength to ensure that each wall system meets the requirements and can be used safely.

It is best suited for dry wall partitions inside buildings as well as walls for room separation that are required for fire safety.

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Elephant Partition System Features and Benefits



Freedom to design and create solutions in all types of construction work

Capable of designing a wall with all desired properties such as soundproofing and fireproofing.



Ensure greater privacy

Capable of blocking more noise than a brick wall of the same thickness.



Optimize the use of Wi-Fi signals

Elephant Wall System does not interrupt with Wi-Fi signals.



Seamless Aesthetic Joint

There is no cracking from the plastering surfaces or at the wall joints.



Economies of scale for new building structure and material savings for construction extension work

It is 6 times lighter than a brick wall, it's therefore able to minimize the size of the new building's beams and eliminate the use of beams for wall extension.



Reduce the electricity costs to use the building's electricity

Elephant Gypsum Wall System has low thermal conductivity, which prevents heat accumulation and helps to save power supply.



Easy to install and 2 times faster than a brick wall

Installation of a dry wall system requires less skill and labor.



More convenient for installing M&E systems (Mechanical and Electrical systems)

The pipe can be routed inside the wall spaces without drilling the surface.



Reduced waste disposal costs and a cleaner working environment

Installation produces less dust and waste.

Wall Structure and Strength

The choice of the walls differs depending on the use of the space in each building, and the most significant factors that influence the design of the walls are:

- Height
- Thickness
- Weight
- Acoustic Performance
- Fire-Rated



Small Hard Body Impact

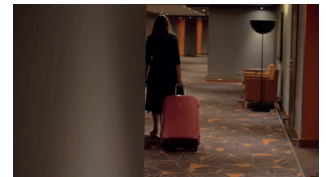
Design of Drywalls by Elephant Gypsum Board

The gypsum wall system has the unique ability to construct in many forms in order to meet the needs of any required design implementation in various structures by using the principles of wall system component modification, such as changing the frame size or installation design of the frames, changes in the number of floors or types, and thickness of the wall panels, including adding sound insulation, and so on.

To ensure safe operation, Elephant Gypsum Partition System adheres to the International Building Code (IBC) by considering the following designation standards.

- Lateral Load 24 kg/m²
- Deflection value reaching the center of the wall not more than L/240

The components of the wall that are designed to meet the needs of the user will have an impact on the wall's strength. As a result, to ensure the use of Elephant gypsum, they are tested for wall strength and durability in accordance with BS 5234 Part 2, and the tested results are classified into 4 grades based on wall strength.



Large Soft Body Impact



Door Slam

Grade	Category of Duty	Usage Areas
Light Duty (LD)	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse.	Residential
Medium Duty (MD)	Adjacent space moderately used primarily by persons with some incentive to exercise care. Some chance of accident occurring and of misuse.	Office Building, Dormitory, Hotel, Hospital
Heavy Duty (HD)	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring and of misuse.	Factory, Hallway inside the building, Meeting Hall, Cinema
Severe Duty (SD)	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormal rough use.	Industrial Plant, Car Parking and Sport Center

Sound Insulation Partition

Improving sound quality in a residential area necessarily involves controlling the volume of sound within the interior and reducing noise transmission to the exterior in order to create a more pleasant environment and to make other people who share the facility feel relaxed and comfortable as well.

Sound Transmission Class of the wall and Test data

According to the international standard ASTM E90 for sound proofing, the resulted rate is a Sound Transmission Class, which is a numerical value indicating the sound attenuation capability of the wall separating the rooms, and ASTM E336 is the field test standard for sound, and this test resulted in ASTC (Apparent Sound Transmission Class).

ASTC appears to have a lower value than STC and, additionally, has a greater probability of transmitting sound from open spaces and flanking paths such as door frames and light switches. If the wall is installed without encountering flanking noise, the result of this type of test is referred to as FSTC (Field Sound Transmission Class).



Sound Transmission Class of each wall system differed based on the materials used and the design of the wall application.

The followings are the examples of the features and capability in sound proofing of the general wall;

Wall Types	Thickness (mm)	Weight (kg/m ²)	Sound Transmission Class	Fire Resistance (hrs)
Lightweight Brick wall (G2) plastered with masonry both sides	100	90	32 – 36	4
Brick Wall plastered with masonry both sides	100	180	35 – 40	1 – 2
Concrete Wall	100	100	40	4
Precast Wall	100	245	45 – 48	2
Multiwall 1 layer with no insulation	94	30	41	1
Multiwall 1 layer installed with NoizeBloc	94	35	48	1

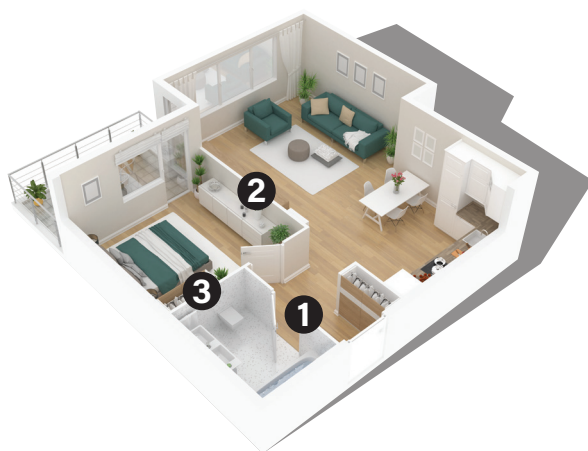
Recommended Sound Transmission Value for interior wall of the different buildings

The pattern and volume of sound produced in each location vary due to a variety of key factors such as the building's location, type, and use, the type and level of the sound source, as well as the level and type of the sound receiving room. As a result, it is necessary to consider the aforementioned factors when selecting a soundproofing wall.

This guide includes a table outlining the sound transmission class of the wall for various building types, as well as recommendations on the fundamentals to consider when designing the wall, beginning with the stage of wall plan inside the building and prior to consulting with sound experts.

Source: Professional practice manual for designing sound quality inside the building 2018 by the association of the Siamese Architects under Royal Patronage

Example of selecting STC value of the wall from table.



40 — Minimum Acceptable Rate 50 — Minimum Rate for High Standard Work		Residential					
STC	Hallway	Kitchen	Living Room	Family Room	Bathroom	Bedroom	
Hallway							
Kitchen	40 45	45 50					
Living Room	45 50	48 55	48 55				
Family Room	40 45	45 50	45 50	40 45			
Bathroom	45 50	45 50	50 55	48 55	50 55		
Bedroom	48 55	52 60	50 60	48 60	50 55	50 55	

Wall ① between living room and bathroom, **50₅₅** STC 50 or STC 55 is recommended.

Wall ② between living room and bathroom, **50₆₀** STC 50 or STC 60 is recommended.

Wall ③ between living room and bathroom, **50₅₅** STC 50 or STC 55 is recommended.

Remark: If a high-standard wall is required, the lower case of STC should be used in the design as it represents the basic minimum rate for high-standard work.

Recommended STC value for Hotel



40 — Minimum Acceptable Rate 50 — Minimum Rate for High Standard Work		Hotel							
STC	Hallway	Store Room	Dining Area	Activity Hall	Lobby	Working Area	Meeting Area	Guest Room	
Hallway									
Store Room	55 60	37 42							
Dining Area	40 50	55 60	40 50						
Activity Hall	45 55	55 60	45 50	55 60					
Lobby	40 45	55 60	40 50	45 55	40 45				
Working Area	40 45	55 60	48 55	55 60	48 55	40 50			
Meeting Area	45 55	55 60	50 55	55 60	50 55	48 55	48 55		
Guest Room	50 55	55 65	60 65	60 65	50 55	50 55	60 65	50 55	

Recommended STC value for Hospital

<div> <div>40 ← Minimum Acceptable Rate</div> <div>50 ← Minimum Rate for High Standard Work</div> </div> <div>Hospital</div>						
STC	Waiting Area	Operation Area	Treatment Room	Patient Room	Diagnostic Room	Private Working Room
Waiting Area	35 40					
Operation Area	37 42	37 42				
Treatment Room	45 50	45 50	45 50			
Patient Room	45 50	45 50	45 50	45 50		
Diagnostic Room	45 50	45 50	45 50	45 50	45 50	
Private Working Room	40 45	45 50	45 50	45 50	45 50	45 50

Recommended STC value for Residential

<div> <div>40 ← Minimum Acceptable Rate</div> <div>50 ← Minimum Rate for High Standard Work</div> </div> <div>Residential</div>						
STC	Hallway	Kitchen	Living Room	Family Room	Bathroom	Bedroom
Hallway						
Kitchen	40 45	45 50				
Living Room	45 50	48 55	48 55			
Family Room	40 45	45 50	45 50	40 45		
Bathroom	45 50	45 50	50 55	48 55	50 55	
Bedroom	48 55	52 60	50 60	48 60	50 55	50 55

Recommended STC value for Office


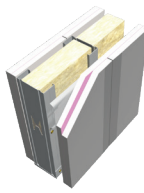
<div> <div>40 ← Minimum Acceptable Rate</div> <div>50 ← Minimum Rate for High Standard Work</div> </div> <div>Office</div>						
STC	Hallway	Open Workspace	Small Workspace	Private Office Room	Meeting Room	Meeting Room with Sound System
Hallway						
Open Workspace	37 42	37 42				
Small Workspace	43 48	43 48	43 48			
Private Office Room	47 52	43 48	43 48	43 48		
Meeting Room	50 55	48 53	37 42	41 46	45 50	
Meeting Room with Sound System	50 55	53 58	53 58	55 60	55 60	55 60

Recommended STC value for School

<div> <div>40 ← Minimum Acceptable Rate</div> <div>50 ← Minimum Rate for High Standard Work</div> </div> <div>School</div>						
STC	Gym	Library	Classroom	Laboratory	Audio Conference Room	Kitchen
Gym	45 50					
Library	50 55	40 45				
Classroom	55 60	40 45	45 50			
Laboratory	50 55	45 50	45 50	40 45		
Audio Conference Room	55 60	45 50	45 50	40 45	45 50	
Kitchen	45 50	50 55	45 50	45 55	55 60	40 45

Recommended Table for the selection of the Elephant Gypsum Wall System **sorted by sound protection properties**

System	Components	Thickness (mm)	Weight (kg/m ²)	Height (m)	Sound Transmission Class (dB)	Fire Rate (minute)	Partition Grade
SSW-010	 <p>Board Elephant Standard 12 mm Profile Elephant ProWall C74, U76 @ 600 mm</p>	98	20	4.1	35	30	Medium Duty
GSW-260	 <p>Board Elephant ZOLIDwall 25 mm Profile Elephant ZOLID Stud @ 600 mm and Elephant ZOLIDwall U 50</p>	100	50	4.0	37	60	Severe Duty
SSW-050	 <p>Board Elephant FireBloc 15 mm Profile Elephant ProWall C74, U76 @ 600 mm</p>	104	32	4.9	38	60	Heavy Duty
SSW-060	 <p>Board Elephant MultiWall 15 mm Profile Elephant ProWall C64, U66 @ 600 mm</p>	94	30	4.4	41	60	Severe Duty
SSW-015	 <p>Board Elephant Standard 12 mm Profile Elephant ProWall C74, U76 @ 600 mm Insulation Rockwool 60k, 50 mm</p>	98	20	4.1	44	30	Medium Duty
SSW-090	 <p>Board Elephant Gypsum FireBloc 15mm 2 Layers Profile Elephant ProWall C74, U76 @ 600 mm</p>	134	60	6.2	45	120	Severe Duty

System	Components	Thickness (mm)	Weight (kg/m ²)	Height (m)	Sound Transmission Class (dB)	Fire Rate (minute)	Partition Grade
SSW-065	 <p>Board Elephant MultiWall 15 mm Profile Elephant ProWall C64, U66 @ 600 mm Insulation Elephant NoizeBloc 50 mm</p>	94	35	4.4	48	60	Severe Duty
SSW-075	 <p>Board Elephant Standard 12 mm 2 layers Profile Elephant ProWall C74, U76 @ 600 mm Insulation Elephant NoizeBloc 50 mm</p>	122	35	4.9	49	60	Heavy Duty
SSW-100	 <p>Board Elephant MultiWall 15 mm 2 layers Profile Elephant ProWall C64, U66 @ 600 mm</p>	124	60	5.7	50	120	Severe Duty
SSW-135	 <p>Board <u>Inner</u> Elephant FireBloc 12 mm <u>Outer</u> Elephant MultiWall 15 mm Profile Elephant ProWall C74, U76 @ 600 mm Accessory Elephant Resilient Bar @ 600 mm Insulation Rockwool 40k, 50 mm</p>	145	58	4.6	56	120	Severe Duty
SSW-245	 <p>Board <u>Inner</u> Elephant FireBloc 12 mm <u>Outer</u> Elephant MultiWall 15 mm Profile Double Elephant ProWall C50, U52 @ 600 mm Insulation Rockwool 40k, 50 mm</p>	200	58	5.9	58	120	Severe Duty

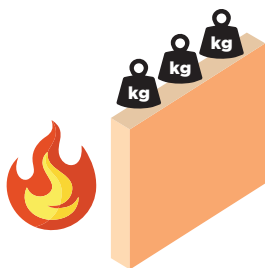
Remark Acoustic testing standard ASTM E90 or equivalent
STC – Sound Transmission Class from laboratory test
Fire resistant testing standard ASTM E119, BS476 Part 22, BS EN 1364-1 or equivalent
Partition grade testing standard BS5234 Part 2

Fire Resistant Partition

A fireproof wall is one that is used to divide areas within a structure in order to limit the spread of fire. It must be designed and installed in accordance with the specified fire resistance rating to prevent the spread of fire and smoke.

Fire Resistance Partition Test Standard

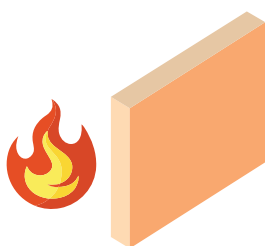
Fire resistance rate testing of the wall complies with international standards such as ASTM E119, BS 476 part 22 and BS EN1364-1 which are American, British, and European standards, respectively. Generally, test results indicate the duration of 60, 120, 180, or 240 minutes during which the wall system can withstand fire without causing further damage, and the terms of test standards include the following considerations regarding the wall's condition during the tests:



Load bearing Capacity

(Structure)

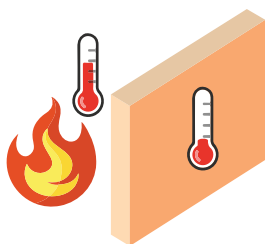
Capable of load bearing as the specified standard during a situation where the wall is bearing the load



Fire Flame Protection Performance

(Integrity)

Capable of blocking the flame and heat through the wall to the outer wall surface



Insulating

Capable to maintain temperature of the outer wall surface as the specified standard

Elephant partition system only considers 2 terms in the test; fire flame protection and insulating, as it is a non-load bearing wall system.



Why can Gypsum Board resist fire?

Gypsum board is primarily made of gypsum compound, the main component of which is water crystal. As a natural consequence, when gypsum board catches fire, the water crystals contained in the gypsum compound gradually vaporize as the temperature rises, allowing the gypsum board to maintain its condition for an extended period of time while exposed to fire flames.

Designing and Application of Fireproof wall

The purpose of designing a fireproof wall within a structure is to ensure that the structure is sufficiently protected from fire. In the event of a fire, buildings equipped with fireproof structures and fire protection systems will be able to provide residents with sufficient time to safely evacuate within a short period of time, thereby minimizing harm to people's lives and bodies, as well as property damage.

If a building owner, architect, or engineer designs a structure that violates the regulations, they may be prosecuted as a criminal offense, which may result in the suspension or prohibition of the building's construction permit or use until the construction design or installation is changed properly in accordance with the rules and regulations.

Regulations in designing fireproof wall for different buildings

At the present time, a number of governments contribute significantly in issuing regulatory documents that establish standards for the design, selection of materials, and installation of various products that are compatible with the intended use of various buildings and structures for fire safety. The following are some of these regulations and standards:

1. Ministerial Regulation Clause 55 and Building Control Act (1979) by the Office of the State Council are legal requirements that must be strictly followed.
2. Standard of fire protection materials and product should be complied with TIS 8101, TIS 8302, TIS 8303 (2009) and standard of designing fire exit pathway TIS 8301 by the Department of Public Works and Town and Country Planning.
3. Fire Protection Standard EIT 3002-51 by the Engineering Institute of Thailand.

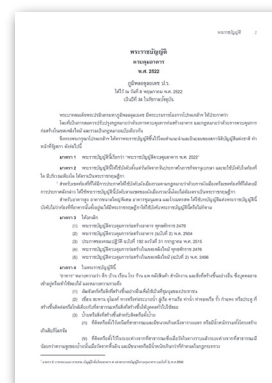
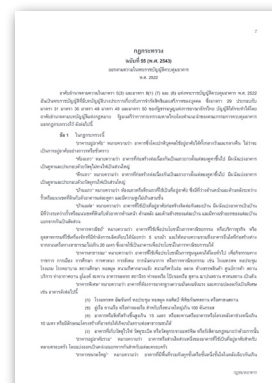
A detailed summary of the area and recommendations for the design of a fireproof wall are as follows:

Area*	Fire rating hours		
	Hotel	Hospital	Condominium
Staircase and Fire Exit**	1 – 2	2	1 – 2
Fire Exit Pathway	0.5 – 1	0.5 – 1	0.5 – 1
Walls between Room	1	1	1
Fire Exist for Disabled	1	1	1
Shaft wall	1 – 2	1 – 2	1 – 2

Remark


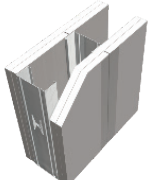
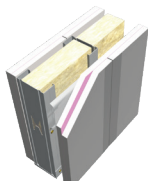
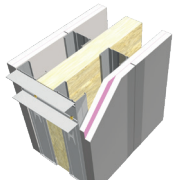
* The fire resistance hour of a wall varies depending on the type and size of the structure. Please refer to the above-mentioned requirements and recommendations for additional information on fire safety.

**Staircase and fire exit are compulsory by the Ministerial Regulation Clause 55



Recommended Table for the selection of the Elephant Gypsum Wall System **sorted by fire resistance properties**

System	Components	Thickness (mm)	Weight (kg/m ²)	Height (m)	Sound Transmission Class (dB)	Fire Rate (minute)	Partition Grade
SSW-010	 <p>Board Elephant Standard 12 mm Profile Elephant ProWall C74, U76 @ 600 mm</p>	98	20	4.1	35	30	Medium Duty
SSW-015	 <p>Board Elephant Standard 12 mm Profile Elephant ProWall C74, U76 @ 600 mm Insulation Rockwool 60k, 50 mm</p>	98	20	4.1	44	30	Medium Duty
GSW-260	 <p>Board Elephant ZOLIDwall 25 mm Profile Elephant ZOLID Stud @ 600 mm and Elephant ZOLIDwall U 50</p>	100	50	4.0	37	60	Severe Duty
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SSW-065	 <p>Board Elephant MultiWall 15 mm Profile Elephant ProWall C64, U66 @ 600 mm Insulation Elephant NoizeBloc 50 mm</p>	94	35	4.4	48	60	Severe Duty

System	Components	Thickness (mm)	Weight (kg/m ²)	Height (m)	Sound Transmission Class (dB)	Fire Rate (minute)	Partition Grade
SSW-075	 <p>Board Elephant Standard 12 mm 2 layers Profile Elephant ProWall C74, U76 @ 600 mm Insulation Elephant NoizeBloc 50 mm</p>	122	35	4.9	49	60	Heavy Duty
SSW-090	 <p>Board Elephant FireBloc 15 mm 2 layers Profile Elephant ProWall C74, U76 @ 600 mm</p>	134	60	6.2	45	120	Severe Duty
SSW-100	 <p>Board Elephant MultiWall 15 mm 2 layers Profile Elephant ProWall C64, U66 @ 600 mm</p>	124	60	5.7	50	120	Severe Duty
SSW-135	 <p>Board <u>Inner</u> Elephant FireBloc 12 mm <u>Outer</u> Elephant MultiWall 15 mm Profile Elephant ProWall C74, U76 @ 600 mm Accessory Elephant Resilient Bar @ 600 mm Insulation Rockwool 40k, 50 mm</p>	145	58	4.6	56	120	Severe Duty
SSW-245	 <p>Board <u>Inner</u> Elephant FireBloc 12 mm <u>Outer</u> Elephant MultiWall 15 mm Profile Double Elephant ProWall C50, U52 @ 600 mm Insulation Rockwool 40k, 50 mm</p>	200	58	5.9	58	120	Severe Duty

Remark Acoustic testing standard ASTM E90 or equivalent
STC – Sound Transmission Class from laboratory test
Fire resistant testing standard ASTM E119, BS476 Part 22, BS EN 1364-1 or equivalent
Partition grade testing standard BS5234 Part 2

Other Accessories in Gypsum Wall System

In order for a wall to be effective for its appropriate use, it is necessary to consider the selection of additional components in addition to the proper installation of the wall panels.

Soundproof Insulation

Soundproof insulations are frequently used in conjunction with gypsum walls to enhance their ability to reduce sound transmission between rooms. The most regularly used materials are soundproof insulation that is simple to install and economical.



1. Glass Wool

Made from organic raw materials such as glass sand and glass scraps and is molten at a high temperature to form fibers, which are then formed into rolls or sheets as required. Due to its porous and cavitation properties of glass wool insulation, it can absorb sound transmission between the gaps.



2. Stone Wool

Made from volcanic rock and is manufactured in a process similar to glass wool insulation, but at a higher temperature.

Insulation Properties Comparison Table

	Glass Wool	Stone Wool
Density	10 –50 kg/m ³	50 –200 kg/m ³
Thickness	20 – 200 mm	30 – 100 mm
Maximum Service Temperature	230 – 260 °C	700 – 850 °C
Usage	Utilize to enhance the sound quality of the general wall of a building, such as a residential, office, hotel, hospital	Utilize to enhance the quality of sound in low-fire-rated and soundproofing walls such as a cinema, factory

Elephant Gypsum Wall System Sample when installing with soundproof insulation

Components		Thickness (mm)	Sound Transmission Class (STC)		
			Without insulation	With Elephant NoizeBloc 50 mm	With Rockwool 50 mm
Board	Elephant Multiwall 15 mm	94	41 dB	48 dB	49 dB
Profile	Elephant Prowall C64, U66 @ 600 mm				
Board	Elephant Standard 12 mm	98	35 dB	43 dB	44 dB
Profile	Elephant Prowall C74, U76 @ 600 mm				

Joint Sealant

The term "joint" refers to the opening lines between a wall and the floor, between a wall and a window frame, or between two walls. It is typically designed to support movement caused by the load or to align with the structure's elasticity. As a result, if those joints are not completely sealed, flanking sound may pass through the space between rooms, reducing the quality of the wall and making it less effective in its design.

Joint Sealant has a semi-liquid consistency in order to fill the joint area. When it dries, it hardens but retains some flexibility, allowing the materials used at the joint to move slightly without cracking. Sealants are generally classified into the following major categories based on the raw materials used in the manufacturing process:

1. **Acrylic Sealant**, also known as DAP, is a polymer material that is water-soluble but does not dissolve in it when hardened, similar to glue
2. **Polyurethane Sealant**, abbreviated as PU, is a thermoset plastic material composed of oil-soluble organic compounds.
3. **Silicone Sealant** is made of polymer, an inorganic compound that is semi-liquid.



Contained in hard or soft tube

Joint Sealant Properties Comparison Chart

	Acrylic Sealant	Polyurethane Sealant	Silicone Sealant
Elasticity	Low	Good	Low
Durability of the environment and UV rays	Low	Neutral	Low
Painting	Can apply	Can apply with a various of colors selection	Can apply with a various of colors selection
Material Surface of using	Ceiling, Gypsum Wall, Door Frame, Furniture	Metallic, Brick wall, Precast Wall Panels	Smooth and dust-free surface such as glass and aluminium
Usage Area	Interior of the building	Exterior and Interior of the Building	Exterior and Interior of the Building



Recommendation

Advancement of technology, there are joint sealants with a special fire resistance property that can be used in both the structure and system work of a building's fire protection system. Therefore also, to effectively use gypsum wall as a fireproof wall, this special joint sealant should be used in conjunction with the Elephant Wall System.



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