PSB FR DOOR CORES

PSB FR is an innovative, eco-friendly engineered product crafted from strands of palm fonds. Specifically designed to meet fire safety standards, PSB FR undergoes a specialized treatment process that enhances its resistance to flames and heat, making it suitable for applications in fire-sensitive environments, such as commercial buildings, residential structures, and industrial facilities. This treatment involves incorporating fire-retardant chemicals during manufacturing, allowing PSB FR to achieve the necessary fire-resistance ratings as mandated by building codes.

Fire-rated Palm Strand Board (PSB FR) has been specifically engineered to incorporate specialized fire-retardant components, enhancing its application in critical structural elements such as door frames and shutters. By integrating advanced fire-resistant additives during the manufacturing process, PSB FR achieves superior performance in terms of fire safety while maintaining the durability and aesthetic appeal of traditional materials. This treatment allows PSB FR to effectively resist ignition and delay the spread of flames, adhering to stringent fire-resistance ratings essential for safety compliance in both commercial and residential settings.

The unique properties of PSB FR make it an excellent choice for fire-rated door frames and shutters, where both structural integrity and fire performance are paramount. In environments prone to fire hazards, these components act as barriers, protecting interiors from external fire threats while contributing to overall building safety. Furthermore, PSB

FR's lightweight yet robust nature makes it easier to install and handle compared to heavier fire-rated materials, facilitating efficient construction and renovation processes.

While PSB FR provides valuable protection against fire, it is important to understand its limitations. Like other fire-rated materials, PSB FR is not entirely fireproof; it is designed to resist ignition and slow the spread of flames for a specified duration. Factors such as improper installation, exposure to moisture, and high humidity can compromise its fire-resistant properties. For optimal performance, PSB FR should be installed in accordance with manufacturer specifications and local building codes, complemented by appropriate fire barriers and safety systems. To maximize the effectiveness of fire-rated PSB FR in door frames and shutters, it is crucial to follow manufacturer guidelines and adhere to local building codes. This ensures that the product's fire-resistant properties are preserved and that the installation integrates seamlessly with other fire protection systems, such as alarms and sprinklers.

FIRE RATING BASED ON ASTM E84

The fire performance of building materials is critical for ensuring the safety and structural integrity of buildings. Fire tests are conducted to evaluate how materials react to fire, including their ignition potential, flame spread, and smoke generation. Different standards provide specific classification systems for materials based on these characteristics**.**

Following the limits as per ASTM E84:

CLASS	LIMITS
Class A	SI 0-25; SDI 0-450
Class B	FSI 26-75; SDI 0-450
Class C	FSI 76-200; SDI 0-450
FSI- The Flame Spread Index	
SDI- Smoke developed index	

The following table summarizes the PSB fire test results along with their classifications according to **ASTM E84** standards for building materials:

TESTING STANDARD	FSI	SDI	CLASSIFICATION
ASTM E 84	35	80	CLASS "B"

FIRE RATING BASED ON EN 13501-1:2008

The fire performance of building materials is assessed based on several key factors, including fire behavior**,** smoke production, and flame droplets**.** These factors are crucial for understanding how materials react when exposed to fire, which directly impacts the safety of occupants and the structural integrity of a building during a fire event. The classification systems established by fire testing standards evaluate these aspects to ensure that materials meet safety requirements.

Table for classification for EN 13501-1:

	Classification according to European Standard EN 13501-1				
Definition	Construction products			Floorings	
non-combustile materials	A1			$A1_{fl}$	
	A2 - s1 d0 A2 - s2 d0 A2 - s3 d0	A2 - s1 d1 A2 - s2 d1 A2 - s3 d1	A2 - s1 d2 A2 - s2 d2 A2 - s3 d2	$A2_{fl}$ - s1	$A2_{fl}$ - s2
combustible materials - very limited contribution to fire	B - s1 d0 B - s2 d0 B - s3 d0	B - s1 d1 B - s2 d1 B - s3 d1	B - s1 d2 B - s2 d2 B - s3 d2	B_{fl} - s1	B_{fl} - s2
combustible materials - limited contribution to fire	C - s1 d0 C - s2 d0 C - s3 d0	C - s1 d1 C - s2 d1 C - s3 d1	C - s1 d2 C - s2 d2 C - s3 d2	C_{fl} - s1	C_{fl} - s1
combustible materials - medium contribution to fire	D - s1 d0 D - s2 d0 D - s3 d0	D - s1 d1 D - s2 d1 D - s3 d1	D - s1 d2 D - s2 d2 D - s3 d2	D_{fl} - s1	D_{fl} - s1
combustible materials - highly contribution to fire	E		E - d2	E_{fl}	
combustible materials - easily flammable	F			F_{fl}	

EN 13501-1:2008 is the European standard that classifies construction products based on their reaction to fire, including their ability to resist ignition, the speed at which flames spread, the amount of smoke produced, and the presence of flame droplets that may fall and cause secondary fires. These classifications are essential for determining which materials are suitable for use in different building applications, depending on the required fire safety level.

Below table shows additional class and level definition:

Additional class			Level definition
smoke emission during combustion	s	1	quantity/speed of emission absent or weak
		2	quantity/speed of emission of average intensity
		3	quantity/speed of emission of high intensity
production of flaming droplets/particles during combusiont	d	0	no dripping
		1	slow dripping
		2	high dripping

Below given the test procedure stages pictures:

Photo 1: Specimen before the test. (Non-Fire Side)

Photo 2: Specimen before the test. (Fire Side)

Photo 3: Specimen after the test. (As seen from the fire-end)

Photo 4: Specimen after the test. (As seen from the exhaust end)

The following table summarizes the fire test results along with their classifications for PSB boards according to **EN 13501-1:2008** standards for building materials:

TESTING STANDARD	FIRE BEHAVIOUR	SMOKE PRODUCTION	FLAME DROPLETS	REACTION TO FIRE CLASSIFICATION
EN 13501-1:2008	C	s1	d0	C-s1,d0

PSB FR DOOR CORE Testing

DISCLAIMER: Always consult local building regulations and fire safety codes before selecting and installing fire-rated PSB FR for door frames and shutters.

Warning: PSB FR Door core does not guarantee complete fire safety. It has to be part of a comprehensive fire protection strategy that includes alarms, sprinklers, and fire-resistant barriers. Regular inspections and maintenance are essential to ensure its continued effectiveness in fire-prone environments.