

Defend-X[®]
Blast Mitigating Structural Coating

THE FIRST LINE OF DEFENSE

Bomb Blast Encapsulation
Explosive Blast Channelling
Fragmentation Containment
Structural Strengthening

Defend-X[®] is a Urethane-Polyurea and Polyurea Spray System for Blast and Other Protective Liner Applications

DefensTech[®]
International Inc.

*Protecting those who
Protect and Serve*

Innovators in Blast Mitigation Protection



Defend-X[®]

Product Features

- Spray-on system
- For structural engineering use
- Two high-quality standard materials (see page 3 for details) Other material designs are possible upon request
- Applied by certified applicators
- Sets in 3 to 6 seconds (see data sheets)
- Tyfo[®] VG/EI fire-resistive system
- Full-scale blast test report available for brick and unreinforced block walls
- EP System - special fabric reinforcement for some applications (see standard sizes)
- Used for weakened walls and other elements to keep blast-destroyed fragments together for life-safety reasons
- Excellent liner material for general construction work

Defend-X[®] The First Line of Defense

Defend-X[®] Blast Mitigating Structural Coating is the professionals choice for most blast hardening and mitigation applications.

Defend-X[®] Blast Mitigating Structural Coating is strong yet flexible. Structures coated with **Defend-X[®]** can withstand blasts up to 20 times greater than an untreated structure can endure.

Defend-X[®] can significantly increase the structural integrity of many common construction materials, for example; wood, steel, concrete, brick and many more. In the event of a blast, treated structural components will flex but stay together.

Blast Fragment Mitigation

Secondary fragmentation is one of the most lethal hazards during an explosion. An application of **Defend-X[®]** to the wall surfaces of a structure will increase the chances of survivability of the occupants in the event of a blast by preventing the wall from breaking into projectiles as secondary fragmentation. Just 1/8" application of **Defend-X[®]** significantly increases the structural integrity of the substrate by 100%, preventing projectile shards, splinters and fragmentation that are primary cause of damage and injury in a blast. **Defend-X[®]** Blast Mitigating Structural Coating can save lives and property.

Installation

Defend-X[®] can be applied to new or existing structures, and works to save lives in the event of an explosion. During testing, the Air Force Research Laboratory found that it took at least the equivalent of more than 1,000 lbs. of TNT to make **Defend-X[®]** fail, "and even then it only tore the coating... fragmentation was still averted."

Environmentally Safe

Defend-X[®] coating are environmentally safe. With adequate ventilation, the compound's emissions are well below the National Institute for Occupational Safety and Health's standards after one-day post application. Within one-week post application, most of the compound's emissions were undetectable. **Defend-X[®]** has no chemical odor after installation.

Fields of Application



Construction, Civil and Military

Protective linings for blast, ballistic, rehab and corrosion control of US Embassy's, NATO buildings, banks, offices, federal buildings, mechanical rooms, sewage treatment tanks and pipes, grain silos, food treatment plants, floors, parking garages, etc.



Petroleum, Oil and Gas Sectors

Linings for thermal, rehabilitation and blast protection of tank farms, pipelines, secondary containment, tank roofs, non-skid and corrosion control of floors, walkways, helicopter pads, workshops, control rooms, etc.



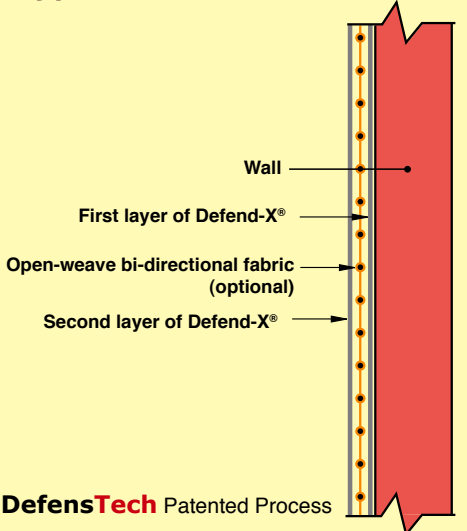
Transportation, Civil and Military

Linings for blast, ballistic mitigation, non-skid and corrosion control of all types of transport trucks, helicopters, buses, trains, boats, ships, freighters, first response containers, law enforcement vehicles, fire and ambulance vehicles, etc.

DefensTech holds exclusive patents in the application process for Blast, Ballistic and Structural Retrofit over various substrates. We can apply our products with excellent adhesion to concrete, wood, steel, fiberglass and some plastics. The outstanding physical, chemical and environmental properties of **Defend-X**[®] make it the natural choice of professionals looking for the best products on the market.

Installation

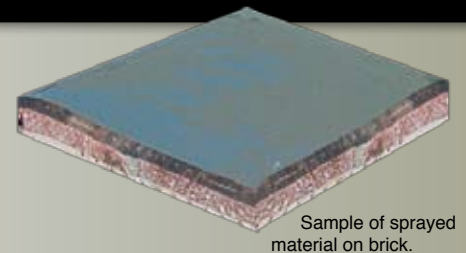
Typical Wall Installation



Defend-X[®] blast mitigating structural coating is flexible yet stronger than steel.

Walls coated with **Defend-X**[®] withstand explosions up to 20 times greater than what a normal uncoated wall can withstand.

Coating an exterior wall of a building with **Defend-X**[®] ensures that the wall can survive a blast without breaking into fragments.



Scientific Testing

Defend-X[®]

Blast Mitigating Structural Coating

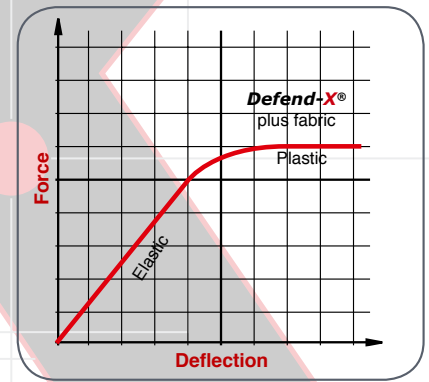


This 3-width red brick masonry wall was retrofitted with 1/2" of **Defend-X[®]**. The average peak pressure was 10.65 psi with a maximum mid-span deflection of 2.5".



Defend-X[®] is a urethane-polyurea (type I) and polyurea (type III) base, two-component system. This high-tech system is spray-applied and cures as a rubber-like material. The material is used for blast and other protection systems.

Defend-X[®] EP is unique; having an open-weave glass, carbon or aramid fabric, which is laid on the element to be strengthened after the first Type I or Type III spray coat. The glass, carbon or aramid fabric adds to the strength of the system. A variety of colors are available upon request.



Two high-quality materials available for blast protection

DefensTech Patented Process

TYPICAL TEST VALUE

Manufactured in the USA

MATERIAL PROPERTIES			
PROPERTY	ASTM METHOD	TYPE I	TYPE III
Density, pcf (pcm)	ASTM D-1622	70 (2)	70 (2)
Hardness (shore D)	ASTM D-2240	40-46	42-50
Tensile Strength, psi (MPa)	ASTM D-412	4,000 (27.5)	2,300 (15.8)
Elongation (%)	ASTM D-412	700 (+/-90)	150
Young's Modulus, psi (MPa)	ASTM D-412	13,000 (89.6)	25,000 (172.3)
Tear Resistance, psi (MPa)	ASTM D-1004	370 (2.5)	400 (2.7)
Color		Gray	Gray

EP SYSTEM STANDARDS				
FABRIC MATERIAL	THICKNESS		FABRIC GRID DIMENSIONS	MODEL NO.
Glass	0.02	0.05	3/8" (10mm)	EP-02G EP-05G
Carbon	0.02	0.04	3/8" (10mm)	EP-02C EP-05C
Aramid	0.02	0.04	3/8" (10mm)	EP-02 A EP-05A

CURE PROPERTIES		
PROPERTY	TYPE I	TYPE III
Gel Time	3 - 7 sec.	3 - 7 sec.
Tack Free	10 - 22 sec.	10 - 22 sec.
Final Cure	7 days	7 days

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