

FIREXX FORTIFICATION

FIREXX FORTIFICATION is a prefabricated construction cladding material that uniquely defends structures against the catastrophic effects of air blast explosions of all kinds ...whether accidental or otherwise.

Typically just a few inches in thickness, FIREXX FORTIFICATION is a substitute or enhancement for conventional blast protection approaches, such using as reinforced concrete or metal ...or siting structures at extraordinary offset distances.

The core technology involved in FIREXX FORTIFICATION is FIREXX[®], an ultra-light (3.3 lb/cu ft) and ultra thin (<2 mm) expanded alloy mesh material. As incorporated in FIREXX FORTIFICATION, bird's-egg-sized FIREXX, mesh ellipsoids are nestled within special expanded metal cages. Rather than 'hardening' structures to reflect the blast waves, FIREXX FORTIFICATION different principals of physics to essentially 'soften' the structure, attenuating overpressures through a compound process of thermal and kinetic energy absorption diffusion of the otherwise coherent blast waveforms.

FIREXX FORTIFICATION is a break-through in several practical respects that, unfortunately, are becoming increasing relevant in the post-"9/1 1" era when there is urgent need for affordable passive protection of structures and peoples from explosions.

FIREXX FORTIFICATION Advancements

- **Is typically hundreds of times lighter than blast protection grade reinforced concrete**
- Is typically 30%.-50% lower in Installed price than blast protection grade reinforced concrete
- Is typically installable a fraction of the time, with semi-skilled labor
- Is detachable, re-locatable and reusable
- Is lifetime-durable, non-corrosive, non-electrostatic, non-degradable.
- Is scalable to almost any assumed blast threat level -from a few pounds to thousands of pounds.
- Is configurable to almost any shape

• Is easily and Inexpensively transported -panels typically are no more than a few inches in thickness
 FIREXX FORTIFICATION often leap-frogs conventional techniques especially in civilian or governmental projects where i) there is a compressed timeline for project completion; ii) the project is a security upgrade to an existing structure -- thus, conventional hardening may not be engineered practically or affordably because of weight and dimension factors, or because the structure is in a restrictive urban setting; iii) protection is needed only temporarily; iv) design requirements are unusually complicated, such as for doors, arches, bunkers, protrusions, parking garages, load bearing beams, conduits, tunnels, bridges, embankments, or; v) materials or skills are not locally available for conventional hardening. When desired, aesthetically appropriate breakaway facade materials can be applied to exterior surfaces of the cladding.

FIREXX and FIREXX FORTIFICATION are the inventions of Ghaleb Al-Hamad, a chemist and scientist and former prominent civil construction company owner in Saudi Arabia. FIREXX originally was invented for use as a flame arrester, for which is remains "best in class" among metal mesh materials. However, unlike similar-appearing "mesh" materials, FIREXX FORTIFICATION is the first material proven to be effective, practical, and affordable for mitigating extremely high overpressures. There are currently 26 US Patents and 111 total patents issued by governments worldwide protecting FIREXX and FIREXX FORTIFICATION material, production equipment and processes and various practical applications of the materials and processes. US Patent No's. 5,500,037 (1996), 5,540,285 (1996), 5,563,364 (1996), 5,576,511 (1996) and 6,216,791 (2001) all relate specifically to FIREXX FORTIFICATION.

FIREXX FORTIFICATION has been extensively tested over the years and, for example, was demonstrated in an experiment at the Army's Aberdeen Proving Ground test facility, to mitigate up to 94% of 'flow through' overpressures resulting from the test explosion of 45 lbs TNT equivalency. There are many important practical advancements as a result of this innovation.

In the past three years since FIREXX FORTIFICATION began selling its products actively, 1 million cu ft of FIREXX FORTIFICATION has been installed for such projects in the Middle East as bomb traps, protection of governmental buildings, guardhouses and protection of strategic material storage sites. As reference for this Nomination, the CIF Jury is provided a 1999 testament letter from ABV Rock, KB, a multi-billion dollar international heavy construction company, which already has completed installation of more than \$100 million of FIREXX FORTIFICATION. The company has forward construction contracts signed for multiples of this production and is actively marketing in other regions.

FIREXX FORTIFICATION currently is manufactured in Riyadh, in the Kingdom of Saudi Arabia. However, material production and prefabrication is easily located anywhere in the industrialized world.

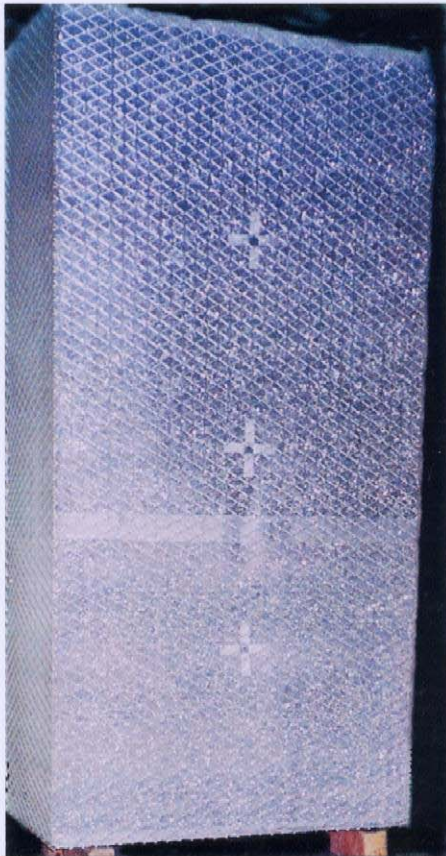
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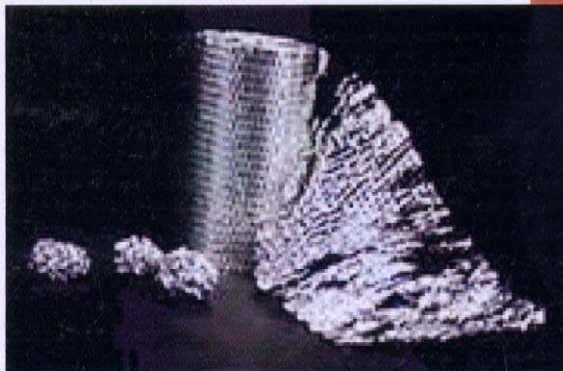
6 inch depth x 6 ft. cladding panels



18 inch depth x 8 ft cladding module



Single ellipsoid



Firexx rolls, expanded sheet and ellipsoid formats



8 ft modules awaiting delivery at Riyadh factory