ON THE JOB

HexArmor

SOLVING OIL-GAS HAND PROTECTION ISSUES

Designing high performance hand protection with global petro-chemical companies.

OVERVIEW

Petro-chemical leaders needed a hand protection solution to reduce cut,puncture, and smash injuries. They actively sought out HexArmor as a strategic partner to help engineer highly protective hand protection for work in refineries, drill sites, and maintenance operations.

FACTS

- Cut and puncture injuries make up close to 50% of all hand injuries
- Smash/contusion make up 45% of all hand injuries
- HexArmor has been working with Halliburton and Exxon Mobil since 2008 to design the highest performance solutions on the market

SOLUTIONS

HexArmor's ability to design and engineer products that address the three major areas of concern (cut, puncture, impact) has helped reduce injury on job-sites, and has opened the doors to future PPE collaboration projects with Exxon Mobil and Halliburton.

For global petro-chemical service companies like ExxonMobil[1] and Halliburton,[2] contractor employee hand injuries represented a disproportionate source of costly worker downtime and insurance claims. ExxonMobil initiated an in-depth study of hand-injuries and established safety glove guidelines and standards[3] in 2008. Initial studies identified smash injuries as the leading cause of on-the-job hand injuries. Industry partner and contractor Halliburton collaborated with ExxonMobil's efforts to refine hand-injury research. They discovered that while smash and pinch injuries were significant in oil field work (approximately 45% of all hand injuries), cut and puncture wounds represented a higher than expected percentage of hand injuries (nearly 50% of all hand injuries) than initially thought.

SEARCHING FOR SOLUTIONS AND SETTING INDUSTRY STANDARDS

With ExxonMobil establishing industry safety standards for protective oil-gas field gloves, and Halliburton fully engaged in the hazard discovery process, the next logical step was to find a glove on the market capable of meeting the new industry standards. Both companies actively searched for a technical glove designer and manufacturer that could engineer a safety glove capable of reducing or eliminating debilitating hand-injuries associated with the oil-gas drilling, transportation, construction and refining processes.

Research of safety gloves available on the market conducted by Exxon Mobil and Halliburton revealed that most construction gloves offered little protection against cut, puncture, smash and pinch injuries. Some of the glove manufacturers contacted resisted modification of glove designs to meet the new industry standards due to lack of design and engineering assets or resistance to the costs involved in retooling production lines.

One company, however, welcomed the challenge of designing and engineering a technical glove to meet the demands of tough oil-gas field applications: HexArmor.

THE HEXARMOR APPROACH TO A BETTER OIL-GAS FIELD SAFETY GLOVE

By putting boots on the ground, or in this case, on oil derricks, refineries and transportation hubs around the world, HexArmor began the process of engineering a more protective oil-gas field glove. A glove capable of meeting the new industry safety standards, and protecting workers from painful and debilitating injuries.

HexArmor literally worked hand-in-hand with ExxonMobil and Halliburton to examine on-the-job hazards in every phase of contractor operations, from upstream discovery and drilling, to downstream shipping and refining operations.

In addition to providing increased protection against cuts, punctures, and smash hazards, grip and dexterity were also major concerns in both upstream and downstream operations. The presence and use of a wide variety of lubricants, specifically those used in hydraulic fracturing (fracking) processes, compromised the grip of competitive gloves and some prototypes. Without proper grip and dexterity, workers could not perform tasks effectively or safely. Any gains made in providing added protection were lost in lack of performance.

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The presence of cabling and wire, on some work sites, also presented unusual puncture hazards that other oil and gas field gloves had never properly addressed. Cut and puncture-resistance against metal burs was another area of concern that previous competitive glove design had yet to solve. HexArmor introduced higher -ANSI /ISEA 105-2005 testing protocols[4] to more effectively ascertain cut resistance of glove materials and designs.

In the material handling operations (moving pipe and equipment), smash and pinch injury hazards presented yet again another protection issue. While HexArmor had already developed an industry standard smash guard material, it was determined that more protection was required, and that a new material needed to be developed.

HEXARMOR OIL-GAS FIELD SAFETY GLOVE SOLUTIONS

The process of creating the ultimate oil and gas field safety glove, one that would offer hand protection across the full spectrum of the industry applications, demanded years of development, as well as meeting industry benchmarks. While the pursuit of the "ultimate safety glove" for oil and gas field work has made remarkable progress since HexArmor began its research and development 2008, it is still a work in progress with new, technical improvements and designs being continually tested in HexArmor laboratories, as well is in the field.

Standard Synthetic Leather Gloves

HexArmor Synthetic Leather Gloves with SuperFabric Guard Plates

AREAS OF FOCUS FOR HEAXARMOR OIL-GAS SOLUTIONS

• CUT RESISTANCE- EXCEEDS ISEA AND CE LEVEL 5

The foundation of HexArmor Oil & Gas Field Gloves is proprietary **SuperFabric.**® The innovative configuration of **SuperFabric**® provides resistance to lacerations, punctures, and slashes like no other material.

• SMASH PROTECTION

Proprietary HexArmor IR10X™ Smash Guards with advanced shock-absorbing materials deliver a superior level of protection and have the ability to absorb blunt force impacts better than any other product on the market.

• PUNCTURE PROTECTION

HexArmor technical Oil-Gas Field Safety Gloves, with **SuperFabric**®, are both laboratory and field tested to validate puncture resistance performance and prevent a sharp edge, corner, burr, wire "wicket," or other protruding hazards from penetrating the glove.

• GRIP AND DEXTERITY

Feedback from the field called for a variety of grip solutions for different saturations of lubricant, and for dry mechanical work. HexArmor engineered palm grips for: high viscosity (LGC's, friction reducers), low viscosity (Oil based muds), and dry situations to give workers the ability to perform their tasks without slipping.

HEXARMOR OIL-GAS FIELD SAFETY GLOVE DEVELOPMENT TIME LINE

2008

Halliburton uses the HexArmor 4035 glove and is satisfied with cut and puncture resistance, but inquires about improving smash protection and grip.

2009

HexArmor responds with the 4018 glove that improves smash resistance, but requires further development of grip characteristics to meet a broader range of industry applications.

HexArmor develops a new line of dedicated Oil-Gas Field Safety Gloves with the introduction of the Gator Grip and with advanced smash guards and cut-resistance offered by HexArmor's proprietary **SuperFabric.**®

2011

HexArmor advances protection and grip through design development:

4020X GGT5®

4021X GGT5® Mud

2021 Light Duty Rig Lizard™

Chrome Series™ 4028 Cut 5 Impact Slipfit™

Chrome Series™ 4026 Cut 5 Impact Hi-Vis

FOOTNOTES

1) Exxon Mobil is the world's largest integrated oil company (ahead of BP and Royal Dutch Shell). Exxon Mobil engages in oil and gas exploration, production, supply, transportation, and marketing worldwide. It has proved reserves of 13.2 billion barrels of oil equivalent. Exxon Mobil's 38 refineries in 21 countries have a throughput capacity of 6.3 million barrels per day. The company supplies refined products to nearly 34,000 service stations in 100 countries. It provides fuel to more than 600 airports and 200 seaports. Exxon Mobil is also a major petrochemical producer. The company posted consecutive US records for annual corporate earnings for 2005, 2006, and 2007. Employees 79,900. Revenue $442.85B.

2) Halliburton Energy Services (NYSE: HAL) is a US-based multinational corporation with operations in more than 70 countries. It has been at the forefront of several media and political controversies in relation to its previous work for the U.S. Government, its political ties, and its corporate ethics. Formed in 1919 Halliburton is a global company that specializes in oil well site services, engineering, construction, technology and various other fields. Halliburton is a Fortune 500 company and is based in Houston Texas. Employees 106,000. Revenue $18.28B.

3) ExxonMobil Safety Standards and Guidelines for Oil-Gas Field Gloves. This is an application-based glove matrix for contractors and ExxonMobil employees that outlines what PPE the worker should be wearing while on ExxonMobile job sites.

4) ANSI/ISEA 105—2005 TESTING PROTOCOLS. American National Standard for Hand Protection Selection Criteria, ANSI/ISEA 105-2011, is designed to assist users and employers to select appropriate gloves for identifiable workplace hazards that could result in chemical burns, severe cuts and lacerations, and burns caused by heat and flame exposures. American National Standard for Hand Protection Selection Criteria, ANSI/ISEA 105-2011, is designed to assist users and employers to select appropriate gloves for identifiable workplace hazards that could result in chemical burns, severe cuts and lacerations, and burns caused by heat and flame exposures.