

**Ansell**



## **A HOLISTIC VIEW OF HAZARDS**

**DEVELOPING SUITABLE SAFETY PROVISIONS  
IN THE OIL & GAS AND MINING INDUSTRIES**



The oil and gas and mining industries are among the most hazardous when it comes to worker safety. A combination of harsh conditions, the presence of physical agents and an overabundance of manually demanding tasks create challenging environments that pose significant risk.

In any industrial setting, recognising and controlling hazards is critical to providing a safe workplace – in surroundings that present a multitude simultaneously, the need being even greater when the environment presents a multitude of hazards.

Adequately identifying oil and gas risks, mining exploration hazards and underground mining risks should be the primary concern of safety managers in these sectors, ensuring they can sufficiently minimise worker exposure and reduce risk of illness or injury.

# ASSESSING AND ANALYSING HAZARDS

While many industries present a clear or limited range of safety risks, both oil and gas and mining are renowned for being more challenging, with workers routinely required to carry out a broad range of specialist tasks in varying environmental conditions. This breadth of behaviours – often carried out in demanding and difficult locations – means workers are susceptible to a greater range of injury types than many other occupations. An analysis of the specific mining safety hazards and oil and gas hazards in these settings will illustrate that workers are at risk of the following injury types:



## CRUSH AND PINCH THROUGH IMPACT

Crush and pinch injuries – especially of the hands and fingers – are common in the oil and gas industry, where workers are required to use their hands to manipulate or guide machinery into place, to operate in adverse weather conditions or where the presence of lubricants, liquids and oils can make it difficult to grip tools and other equipment like valves and pipes.

Mining presents a similar range of risks, with activities carried out and equipment used during exploration, construction, drilling, production, transportation and refining, often conducted in extreme conditions resulting in hands being potentially exposed to crush and pinch injury through impact.

## EXPOSURE TO HAZARDOUS CHEMICALS AND FLUIDS

Workers in the oil and gas and mining industries are routinely exposed to hazardous chemicals that are natural by-products of the job itself – such as benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX compounds). These occur naturally in crude oil and are created and used during petroleum processing.

Some tasks in these industries – such as hydraulic fracturing – require the use of chemicals or fluids including oil, that put workers at risk of chemical burns or absorption via the skin. Exposure and contact are common through liquid spray, splash or immersion, as well as inhalation of toxic vapours.

## FIRE AND EXPLOSION

Workers in these industries face fire and explosion risks through ignition of flammable vapours or gases. Flammable materials can be released from wells, trucks, production equipment or surface apparatus such as tanks and shale shakers. Ignition sources include static, electrical energy sources, open flames, lightning, cutting and welding tools, hot surfaces, frictional heat and even cigarettes.

## PUNCTURE, CUT AND ABRASION

Puncture, cut and abrasion injuries can occur when workers are exposed to sharp blades or edges, dangerous tools and machinery. Many oil and gas and mining activities, including machining, assembly, installation, operation and field repair of equipment and assets, constantly subject workers to the threat of injury.

## EXTREME TEMPERATURES

Oil and gas and mining workers are often exposed to extreme temperatures and varying weather conditions. High heat and humidity can make it hard for the body to cool itself, leading to responses including heat rash, cramps, heat exhaustion and heat stroke. Cold temperatures are also problematic – as the body loses heat, blood vessels constrict, affecting extremities first. Cold and numb hands and feet indicate a loss of body heat and are often accompanied by shivering, the first warning of hypothermia.

# SELECTING SUITABLE SOLUTIONS



The overtly dangerous nature of these industries demands a practical approach to the selection of suitable PPE, including hand protection.

To offer the best defence against the multitude of hazards present, gloves should be impact-absorbing, feature a high visibility design, be waterproof and chemical resistant, offer high durability and deliver the dexterity, flexibility and enhanced grip required to carry out typical tasks without introducing any additional risk. When assessing available options, safety and operations managers should take the following types of protection into account.

## IMPACT PROTECTION

Impact of the hands and fingers can result in a range of conditions from bruising to bone fracture, soft tissue or nerve damage and, in extreme cases, amputation. It is vital that chosen hand protection solutions offer an effective shield for knuckles, full length fingers and thumbs, while still maintaining maximum dexterity, flexibility and comfort. Safety gloves designed specifically to offer impact protection should incorporate a raised rubber bumper intended to absorb force. They should also be constructed from high visibility materials, which delivers an increased awareness of the hand position for the user and lessens the likelihood of mishandling when using tools or guiding equipment and machinery.

## OIL PROTECTION

Workers need suitable surface barrier protection to prevent oils and other lubricants from making skin contact. Oil protection gloves should also offer an enhanced grip, which will mitigate

muscle fatigue and allow the proper handling and use of the medium- to heavy-duty tools and equipment typically found in these environments.

## CHEMICAL PROTECTION

Chemical contamination can occur via inhalation or (often unnoticed) dermal contact through spray, splash or immersion. Chosen hand protection solutions should be constructed from a barrier material that offers defence (consideration of permeation, degradation and penetration is important) against the specific chemical types the user is in contact with.

## CUT PROTECTION

Risk from exposure to sharp edges, blades or other dangerous tools and machinery should be minimised with a glove that offers suitable cut protection. Graded on a six-level rating scheme (from A-F), cut resistance is measured in Newtons and based on the weight required to cut through a specific glove material.

## HEAT AND COLD PROTECTION

Exposure to extreme temperatures is best addressed through appropriate clothing and fit-for-purpose PPE. Construction fabrics are important, as many choices (such as cotton) provide no insulation value when wet. Using hand protection designed specifically for hot or cold environments is crucial to mitigate the effects of extreme temperature hazards.

# ATTRIBUTES FOR IMPACT

The prevalence of impact injury in the oil and gas and mining industries has led to the development of specific technologies designed to deliver the ultimate mechanical protective gloves for use in the most demanding applications.



## TPR DESIGN

Impact protection gloves incorporate thermoplastic rubber (TPR) which disperses impact energy. A TPR 'bumper' – located on the back of the hands, full-length fingers and thumbs – absorbs the force of impact and prevents injuries to bones, muscles, tendons and ligaments in the hands.

## ADDITIONAL FEATURES

Though designed specifically with impact in mind, there are many additional available features that make this range of gloves particularly suitable for oil and gas and mining applications.



## F3 TECHNOLOGY

Fit, form and function combine in a holistic approach to the design and construction of safety gloves. F3 technology delivers maximum protection with the dexterity to perform tasks and comfort for all day wear.

- Touchscreen compatibility allows the wearer to access smart devices and technology without glove removal.
- The Silicone Dot® grip system application on the glove palm offers oil resistance with enhanced grip, easing pressure on the hands and reducing fatigue.
- Cut and chemical protection – impact resistant gloves can also protect from other hazards. Multi-protection solutions give workers the confidence they need to perform tasks as required.

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