



SILVER NEEDLE INC.™

SUPERIOR FABRICS SUPERIOR DESIGN SUPERIOR PERFORMANCE

Handling cryogenic fluids may result in exposure to cold liquid, boil-off gas, or cold surfaces. Protective clothing must be worn to guard against the hazard of coming into contact with the cold. The recommended cryogenic safety clothing includes using face protection, safety gloves, long sleeve shirts, lab coats, and aprons to achieve full body coverage.

Silver Needle Inc., with the cooperation of Northwest Natural Gas, has developed a protective cryogenic coverall, and cryogenic gloves that when worn together will protect your entire body from cold contact hazards. The cryogenic coverall design is based on our patented **Flash Fire Natural Gas Extraction Suit System** coverall. The aluminized fabric used for the coverall was selected after numerous other fabrics were field tested, and the aluminized surface has been proven to repel cryogenic natural gas liquid. The cryogenic coverall is double stitched using **DuPont™ Kevlar®** thread. The arms and the leg openings use hook and loop closures to provide a seal in order to prevent liquid or gas from entering the coverall. The collar design is similar to the protective gear used by fire departments for increased neck protection. The front of the coverall utilizes a heavy duty **DuPont™ Nomex®** zipper that is overlapped with a hook and loop storm flap type closure designed to prevent gas vapor and gas liquid from entering the cryogenic suit.



Our cryogenic gloves were also tested by Northwest Natural Gas in the LNG plant. Liquid gas was run over the fabric to see if liquid gas would seep through the cloth during the first pass or a second trial. No LNG penetrated the fabric which remained intact after the cloth returned to ambient temperature. A second test was performed on the same fabric samples. A recession was made in the fabric to cup liquid natural gas in order to pool the liquid and see if the minus 260 degree Fahrenheit (-260°) temperature would break down the same fabric that was previously tested. No LNG was able to penetrate the fabric and again the fabric "looked like new" upon returning to ambient temperature. The individuals administering the test indicated that at no time would a worker experience such liquid gas exposure, and that the amount of liquid natural gas used in both tests, in all probability, would never be encountered. Samples of worn gloves were also tested for penetration at the seams. No apparent liquid natural gas penetration was found.

Silver Needle Inc. provides sizing garments for companies to use to get the correct fit for their employees. Call for additional information.

1-800-863-7733. www.silverneedle.net

