

**Smart SMEs – Market Validation Program
Technology Requirement Specifications (TRS)**

TRS Title	Protective Gloves for Prison Officers
Technology area/s	Materials Science, Small technology
Host public sector entity	Department of Justice
Project description	
Purpose	To develop and demonstrate a cost effective reusable, cut, puncture and pathogen-resistant protective glove for Prison Officers.
Description of technology need	<p>Protective gloves are an important part of standard personal protective equipment of Prison Officers to avoid risks from blood-borne pathogens, including hepatitis or HIV and from sharp-edged objects. Although all searches are conducted according to strict protocols and procedures in order to reduce the threat of harm or infection, the correct glove protection can significantly reduce or eliminate potential injuries to Prison Officers.</p> <p>Searches are conducted within all areas of prisons to find any articles or substances that may threaten the good order or security of the prison. All prison staff undertake training on techniques to minimise infection control in the conduct of searches. The searches are conducted in accordance to strict procedures to avoid injuries from sharp objects or hazardous materials.</p> <p>Nonetheless, the safety of Prison Officers in conducting these searches would be considerably enhanced by a protective glove that was resistant to pathogens, punctures, cuts or tears. Furthermore, Community Correctional Officers may be required to undertake searches of offenders on occasion (e.g. community work sites) that would be assisted by a protective glove.</p>
Description of proposed solution	<p>The protective glove for Prison Officers would need to be flexible, fit well, puncture resistant, pathogen resistant and allow dexterity for fine manipulations to perform searches without increasing the wearer's susceptibility to heat stress.</p> <p>The key specifications for the protective glove must include:</p> <ul style="list-style-type: none"> • Pathogenic resistant: provide protection against microbiological pathogens that are transmitted through physical contact or contact with bodily fluids. • Dexterity: provide the dexterity requirements for fine manipulation of objects. • Cut resistant: provide protection against slashes and/or cuts by sharp objects. • Tear resistant: provide protection against tearing when the gloves snag and subsequently tear when they come in contact with a sharp object. • Puncture resistant: provide protection against penetration by pointed, sharp objects. • Tactility: to provide tactile perceptiveness in manipulation by the glove wearer. • Comfort and fit: provide a level of comfort and fit for a range of users without susceptibility to heat. • Affordability: provide a cost effective technology solution that can be used in routine searches.
Keywords	Materials science, protective gloves, prisons

References	<p>A desktop audit indicates that a number of protective gloves are commercially available that provide a range of protections against pathogens, cuts, punctures and tearing. These protective gloves use a range of materials, including leather, PVC and Kevlar.</p> <p>However, no glove material provides protection against all threats and comfort for wearing for extended periods. Recent advances in small technology may lead to developments of materials that meet the need for comfort, flexibility and less weight.</p> <p>Special material developed with small particles exhibits characteristics of a semi-fluid state under normal conditions, but adopts seemingly rigid qualities and becomes less penetrable when impacted. These advances could be applied to developing an improved protective glove for Prison Officers.</p> <ul style="list-style-type: none"> • <i>A Comparative Evaluation of Protective Gloves for Law Enforcement and Corrections Applications</i>, National Law Enforcement and Corrections Technology Centre, National Institute of Justice, October 2001 • <i>Nanotechnology and Protective Clothing for Defence Personnel</i>, Defence Science Journal, Vol. 58, No.4, July 2008
Project stages	
Proof of Concept	<p>The required Proof of Concept outcomes are to:</p> <ul style="list-style-type: none"> • Develop a prototype test. • Test the prototype within a specified prison with relevant training provided to prison personnel. • Test the prototype within a specific Community Correctional Services location with relevant training to Community Correctional Services personnel. • Demonstrate cost effectiveness and reliability of the prototype according to specifications identified by the Department.
Further information	<p>If you require further information about this TRS, please email the MVP project team at: mvp@diird.vic.gov.au</p>