

Smart Glove Holdings Recognized for

2021

Technology Innovation Leadership

Global Medical Gloves Industry

Excellence in Best Practices

SMART GLOVE™

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Smart Glove Holdings Berhad excels in many of the criteria in the medical gloves space.

AWARD CRITERIA	
<i>Technology Leverage</i>	<i>Business Impact</i>
Commitment to Innovation	Financial Performance
Commitment to Creativity	Customer Acquisition
Stage Gate Efficiency	Operational Efficiency
Commercialization Success	Growth Potential
Application Diversity	Human Capital

A Constant Flow of Innovative Inventions Meet Industry Demand

In response to the COVID-19 outbreak, personal protective equipment (PPE) is in higher demand. PPE refers to any equipment that protects the user from risks to their health or safety. Some examples of

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*- Anjan Roy,
Chemicals, Materials & Nutrition
Industry Analyst*

such equipment are facemasks, gloves, eyewear, high-visibility clothing, and safety harnesses. Gloves are an example of PPE that prevents the spread of infection and illness during medical procedures. Malaysia produces almost three-quarters of the medical gloves on the market, making it the largest supplier globally. The rubber glove industry is seeing a rise in demand for PPE, especially with governments introducing new incentives for glove manufacturers.

Consumers seek gloves with improved attributes related to longevity, dexterity, comfort, grip, and health in today's market. There is a growing need for less fatigue

and better skin protection which prevents latex associated skin allergy issues. Innovation and technology have changed the glove industry, with consumers now having an entirely new category of gloves to fit a variety of purposes.

Manufacturers will have to understand consumer needs and purchasing behaviors to compete in the fast-developing growing glove market.

Founded in 1995, Smart Glove Holdings Berhad (Smart Glove) is one of Malaysia's leading innovative glove manufacturers within the global market. With more than 20 years of glove manufacturing experience, Smart Glove offers a broad range of gloves with different specifications to meet customers' needs from various industries and use cases, such as medical, food, and cleanroom. Currently, Smart Glove operates six factories in Malaysia and Indonesia, all equipped with modern facilities. As a pioneer in nitrile disposable glove technology, Smart Glove strives to remain at the forefront of the glove industry through always-on innovation that creates reliable, comfortable, and environmentally friendly gloves suitable for a wide variety of applications.

Among the types of gloves, it manufactures are natural latex, nitrile, hybrid polychloroprene, and polyisoprene gloves. Since its inception, Smart Glove has introduced countless innovations in synthetic gloves and manufacturing technology. The company's most notable innovations include:

- **Advanced/improved synthetic copolymer polychloroprene gloves (C-Series gloves):** It has re-engineered the raw synthetic latex into chloroprene gloves with improved weight, thickness, and strength that exceed the requirements of global standards. These innovations have resulted in producing thin but durable polychloroprene gloves that are cost-effective, produce less waste, and provide both medical and non-medical users' protection. For its C-Series gloves, the company currently holds patents in twenty (20) countries and pending patent applications in five (5) countries, while it holds patents for its grafted C-Series in twenty (20) countries.
- **Advanced soft nitrile gloves (S-Series gloves):** An improved nitrile film made it possible to manufacture softer gloves than previously available, making them the most delicate gloves available today. These gloves are more robust, thinner, lighter, and elastic but still retain good elongation. For its S-Series gloves, Smart Glove holds seven (7) patents and has six (6) pending patent applications.
- **Electrostatic dissipative gloves:** Specifically designed for cleanroom gloves, the gloves' formulation possesses electrostatic discharging properties. The use of electrostatic discharge is crucial in semiconductor fabrication and highly sophisticated electronic component fabrication activities, where devices or components can be easily damaged by electrostatic charges, causing millions of dollars in losses to fabricators. Compared with conventional gloves, the gloves have a lower surface resistivity which avoids damage to a semiconductor. The company currently has pending patent applications in four (4) countries.
- **Industry-leading lightest and thinnest nitrile gloves:** The technology yielded the world's thinnest synthetic gloves and the lightest nitrile gloves ever. It has a high degree of touch sensitivity, provides a better comfort level, and remains strong and durable to provide the necessary protection. It is a "green glove" innovation that reduces the consumption of raw materials and waste production. The company holds thirty-seven (37) patents and pending patent applications in nine (9) countries.
- **Nitrile metal detectable gloves:** Safety equipment, such as metal detectors for use in high security and safety environments, can easily detect these gloves. For example, airlines must scan food before bringing it onboard. Sensors will detect any parts of foreign articles, such as torn gloves in the food,

and will be able to remove them accordingly. It is an excellent advancement for the food industry since it immediately detects contamination and reduces commercial losses caused by product recalls. Smart Glove holds one (1) patent and has pending patent applications in ten (10) countries.

- **Antimicrobial gloves:** Antimicrobial gloves are used in medical or surgical use cases to kill microbes. With this invention, the gloves will kill microbes instantly and continue to protect the skin for an extended period from repeated exposure to antimicrobial agents contained within. Marketing efforts are underway for these antimicrobial gloves, though the gloves are yet to launch. The company has three patents and pending patent applications in 17 countries.

Smart Glove has demonstrated its ability and expertise to create and bring many unique and authentic gloves inventions that others have copied to market. The company is a pioneer of innovation and has a strong track record of patenting and commercializing its gloves. Smart Gloves' wide variety of key innovative gloves, which are patented¹, and subsequently commercialized, is expected to drive the company's growth as an innovative glove manufacturer throughout the world. Smart Glove successfully identifies gaps in industry needs for hand protection and produces gloves with extraordinary features that exceed expectations. Consumers, and even other market participants, can benefit from its many glove enhancements, giving the company an edge over its competition. Frost & Sullivan applauds Smart Glove for its commitment to understanding market needs, as well as its success in enabling its products to meet these ever-changing needs and bring many benefits to various industries and end-users.

Excellent Technology Capability that Results in Maximum Customer Satisfaction

“Smart Glove ensures maximum barrier protection and consistently delivers products that exceed customers' expectations through this process. Additionally, all gloves are manufactured and inspected according to Good Manufacturing Practices, surpassing the American Society for Testing and Materials standards, the EN, the European Union Law Regulations, and FDA requirements for PPE.”

**- Norazah Bachok,
Best Practices Research Analyst**

A growing number of healthcare concerns and cases of COVID-19 will encourage the use of gloves in hospitals and clinics, especially with the emergence of the new and more contagious virus strain. Furthermore, within non-medical industries, there is a high demand due to greater attention paid to cleaning, sanitation, worker safety, and food safety. The pandemic outbreak has caused global supply shortages, resulting in a lack of gloves to meet these growing demands. In acknowledging its responsibility to make glove production more efficient and timelier, the company has taken several proactive steps to speed up the process. With six production factories in Malaysia and Indonesia (5 factories in Malaysia and 1 factory in

Indonesia) and six additional high-capacity production lines, Smart Gloves produces 1.8 billion pieces annually. The company is currently building 68 additional production lines to increase its glove production volumes which will begin production in 2022, adding 18 billion pieces annually.

To strengthen its growth plan, Smart Glove engaged in strategic partnerships. These partners will participate in the expansion of manufacturing facilities to provide new innovative products to

¹ Patents granted and pending in multiple countries

consumers. All partners within this group are International Organization for Standardization (ISO) certified, ensuring that their gloves comply with some international standards and meet market regulations in most countries.

To produce gloves to meet the high demand, Smart Glove understood that quality was another critical factor. As a result, Smart Glove implements multi-gated quality control processes which are complemented by independent third-party inspection where required by the customer. Smart Glove ensures maximum barrier protection and consistently delivers products that exceed customers' expectations through this process. Additionally, all gloves are manufactured and inspected according to Good Manufacturing Practices, surpassing the American Society for Testing and Materials standards, the European Standards (EN), the European Union Law Regulations, and Food and Drug Administration (FDA) requirements. Smart Glove products are certified with the highest known quality standards of the ISO 9001: 2015, EN ISO 13485: 2016, and ISO 13485: 2016. Furthermore, it can also market its products in the United States through the FDA's 510(k) process.

Based on Frost & Sullivan's analysis, Smart Glove provides several technologies that optimize process chain output, decrease production times, and reduce material consumption. Due to heightened sanitation and health concerns following COVID-19, glove demand will remain high. Smart Gloves' proactive steps to meet future industry demands are commendable.

Exceptional Financial Results and Stronger Market Positions

Despite occasional lockdowns and Smart Glove temporarily shutting down its operations, the company has achieved production volumes and financial growth. As of the end of 2020, the company grew its financial performance by approximately 165% and produced around 4.4 billion gloves (compared to 3.2 billion in 2019). By focusing on automation and lowering its reliance on hard labor, Smart Glove, which employs almost 2,000 people, will boost production in 2021 onwards and capitalize on market potential in the long run.

To bolster its brand, Smart Glove works continuously to enhance its branding of its patented² products. I-Chef™ and Smart Clean™ are among the trademarks used on Smart Glove's products. Further, Smart Glove's corporate brand (Smart Glove®) is now a registered trademark in Malaysia. About 65% of the company's exports are to the United States, 20% to Europe and 15% to rest of the world. There are growing numbers of customers in the Asia-Pacific region, the United States, Europe, and Australia. Smart Glove receives positive feedback from its customers regarding its glove product lines and a strong presence in global markets will help to build the brand.

² Patents granted and pending in multiple countries

Conclusion

Smart Glove Holdings Berhad has consistently introduced many ingenious inventions to the global gloves industry, specifically within the medical gloves market. With unique product lines, including its C-Series and S-series gloves, metal detectable gloves and the world's lightest nitrile gloves, the company captures the attention of its customers through its innovative glove products. Despite the challenges of the COVID-19 pandemic, Smart Glove Holdings Berhad excels at managing its production process without neglecting standard operating practices. As a result, the company grew by more than 150% in the past year. It successfully developed the highest quality of gloves and consistently works to meet client demands. By utilizing technology and its long-standing expertise, the company keeps pace with today's competitive environment, thus consistently proving its exceptional performance.

With its strong overall performance, Smart Glove Holdings Berhad earns Frost & Sullivan's 2021 Global Technology Innovation Leadership Award in the medical gloves industry.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

