8. INDUSTRY OVERVIEW

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8 March 2021

The Board of Directors
HARPS Holdings Bhd
K03-08-01 Tower 3 UOA Business Park
1 Jalan Pengaturcara U1/51A Seksyen U1
40150 Shah Alam, Selangor, Malaysia

Dear Sirs and Madams

Independent Assessment of the Rubber Glove Industry

We, Vital Factor Consulting Sdn Bhd (Vital Factor), are an independent business consulting and market research company in Malaysia. We commenced our business in 1993 and, among others, our services include the development of business plans incorporating financial assessments, information memorandums, commercial due diligence, feasibility and financial viability studies, and market and industry studies. We have been involved in corporate exercises since 1996, including initial public offerings and reverse takeovers for public listed companies on Bursa Malaysia Securities Berhad (Bursa Securities), acting as the independent business and market research consultants.

We have been engaged to provide an independent industry assessment on the above subject for inclusion into the prospectus of HARPS Holdings Bhd in relation to its proposed listing on the Main Market of Bursa Securities. We have prepared this report independently and objectively and had taken all reasonable consideration and care to ensure the accuracy and completeness of the report. It is our opinion that the report represents a true and fair assessment of the industry within the limitations of, among others, secondary statistics and information, and primary market research. Our assessment is for the overall industry and may not necessarily reflect the individual performance of any company. We do not take any responsibilities for the decisions or actions of the readers of this document. This report should not be taken as a recommendation to buy or not to buy the shares of any company.

Our report includes assessments, opinions and forward-looking data and statements, which are subject to uncertainties and contingencies. While such data and statements are made based on, among others, secondary information, primary market research, and after careful analysis of data and information, the industry is subject to various known and unforeseen forces, actions and inactions that may render some of these data and statements to differ materially from actual events and future results. In light of these and other uncertainties, the inclusion of assessments, opinions and forward-looking data and statements may differ from actual events.

Yours sincerely

Wooi Tan
Managing Director

Wooi Tan has a degree in Bachelor of Science from The University of New South Wales, Australia and a degree in Master of Business Administration from The New South Wales Institute of Technology (now known as the University of Technology, Sydney), Australia. He is a Fellow of the Australian Marketing Institute and Institute of Managers and Leaders (formerly known as the Australian Institute of Management). He has more than 20 years of experience in business consulting and market research, and have assisted many companies in their initial public offerings and listings on Bursa Securities.

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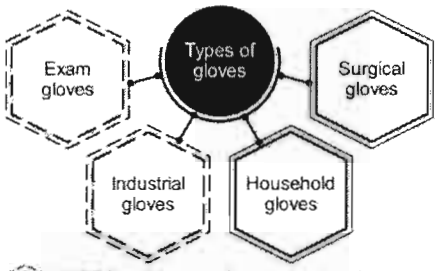
INDEPENDENT ASSESSMENT OF THE RUBBER GLOVE INDUSTRY

1 INTRODUCTION AND INDUSTRY STRUCTURE

- HARPS Holdings Bhd and its subsidiaries (HARPS) are involved in the manufacture of rubber gloves focusing on nitrile examination (exam) gloves, which will be the focus of this report. In the context of this report, the term "gloves" refers to rubber gloves including natural rubber (NR) and acrylonitrile-butadiene rubber (NBR or nitrile). All references to the number of gloves are for pieces of gloves.

- Generally, gloves act as a protective barrier for users and are categorised as follows:

  - **Exam gloves** can be divided into medical and non-medical grade. Medical grade exam gloves are mainly used in the healthcare industry which has to comply with international medical device regulations in several countries. As for non-medical grade exam gloves, these are generally used in non-healthcare sectors such as hospitality, food and beverage, electronics, automotive, biotechnology, laboratory and pharmaceutical. It should be noted that medical grade exam gloves can be extended to be used in non-healthcare industries. Therefore exam gloves are used in a diverse range of industries. Within the exam glove segment, there are also specialty exam gloves that are designed for specific applications such as gloves for use during chemotherapy procedures, and in cleanroom environment. Exam gloves can also be sterile or non-sterile. According to the US Food and Drug Administration (FDA), the minimum acceptable quality level (AQL) for medical grade examination gloves is 2.5. The AQL is the maximum percentage of defective sample units permitted in a lot that will be accepted approximately 95% of the time.



HARPS mainly manufactures exam gloves. They are also involved in the manufacture of industrial gloves.

  - **Surgical gloves** are mainly used in surgical procedures and hence, this type of gloves need to comply with more stringent medical standards as compared to exam gloves including increased puncture and tear resistance, providing comfort fit for users during long periods of usage, and offering higher sensitivity and flexibility. For surgical gloves, the minimum AQL is 1.5.

  - Other types of gloves include **industrial** and **household gloves**. Industrial gloves are used in industrial applications mainly to protect against hazardous substances, abrasion and high temperature. Household gloves are mainly used for general household tasks including gardening, cooking, dishwashing and cleaning.

- Gloves are made from different types of rubber materials including NR or synthetic rubber such as nitrile, polychloroprene and polyisoprene. The most common glove materials are NR and nitrile. Over the last few years, the use of nitrile gloves has grown faster at the expense of NR gloves. This is mainly due to the advantages of nitrile as it eliminates the risk of protein allergy and provides better resistance to oils, solvents and chemicals, and better tensile strength for the same thickness of glove or thinner glove to a certain extent as compared to NR. Nitrile gloves are also able to emulate the properties of NR gloves in terms of elasticity and tactility. Nitrile as a raw material is also more predictable in supply and is not dependent on environmental factors such as weather and seasons. In 2020, nitrile gloves accounted for approximately two-thirds of the total production of gloves in Malaysia compared to one-third in 2010 *(Vital Factor analysis)*.

- Generally, gloves are also segmented into powdered and powder-free gloves. Powdered gloves commonly contain corn starch which is added to facilitate glove donning while powder-free gloves undergo an additional process of chlorination or polymer coating which reduces the tackiness of the gloves for ease of donning. Generally, powdered gloves may cause skin and respiratory irritation or allergies. In 2016, FDA issued a ban on powdered medical gloves due to the risks of illness or injury to individuals exposed to powdered gloves.

- HARPS specialises in the manufacture of powder-free nitrile exam gloves for healthcare and non-healthcare applications including industrial and food handling.

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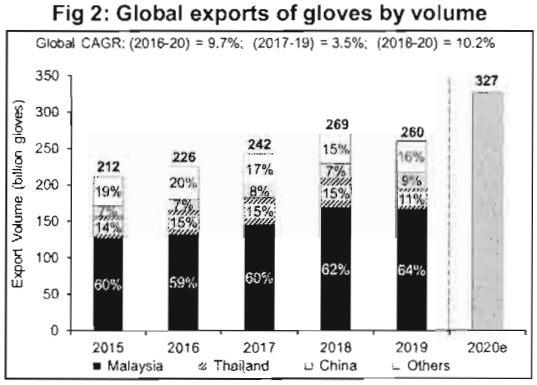
2 DEMAND AND SUPPLY

2.1 Global glove exports and imports

Fig 1: Global exports of gloves

Fig 2: Global exports of gloves by volume



e = estimates. CAGR = Compound annual growth rate. Sources: Department of Statistics, Malaysia (DOSM); Vital Factor analysis. Global import and export statistics are provided in USD for value, and tonnes or kilograms (kg) for volume.

- The global glove export value grew at an estimated CAGR of 27.9% from USD7.9 billion in 2018 to USD13.0 billion in 2020 while export volume grew at an estimated CAGR of 10.2% from 269 billion gloves in 2018 to 327 billion gloves in 2020.

- Global glove export comprises surgical and non-surgical gloves. Non-surgical gloves include exam gloves and other types of rubber gloves. In 2019, the global export volume of non-surgical gloves which mainly comprised exam gloves, accounted for 90% of the total global export volume while 10% were surgical gloves. Therefore, exam gloves constitute the bulk of the total global export volume.

Fig 3: Global glove importers

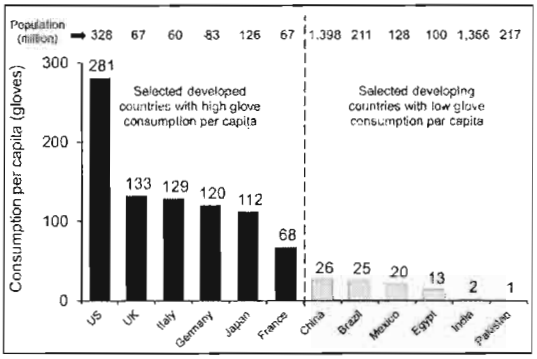
Total does not add up due to rounding. Source: Vital Factor analysis.

- The global export volume of gloves grew by an estimated 26% to 327 billion gloves in 2020. The strong growth rate in 2020 compared to the previous years was mainly driven by the COVID-19 pandemic conditions.

- In 2019, the top five importing countries accounted for 54% of the total global import volume of gloves. This was led by the US as the world's largest importer of gloves. HARPS' largest export markets were the North America and Asia regions which accounted for 80.8% and 16.9% of its total revenue for the financial year ended 31 December 2020 respectively.

2.2 Global glove consumption

Fig 4: Glove consumption per capita in 2019



The glove consumption per capita is computed based on the net imports of gloves, save for China which takes into consideration local production. China is a net exporter of gloves while the other selected countries are net importers of gloves. Source: Vital Factor analysis.

- At 281 gloves per capita, the US had the highest glove consumption per capita among the selected major global importers of gloves in 2019. The relatively lower glove consumption per capita in developing countries may serve as a driver of growth for gloves.

- The Northern European countries of Sweden, Denmark, Finland, Norway and Iceland are net importers of gloves. In 2019, the average glove consumption per capita in these Northern European countries was 138 gloves.

- The differences in glove consumption per capita between the selected developed countries and developing countries may be due

to accessibility to healthcare which is reflected in the disparity in healthcare expenditure. The average healthcare expenditure per capita between the selected developed and developing countries were USD5,099 and USD347 respectively in 2017 (based on the latest available statistics). The prolonged COVID-19 pandemic which has contributed to the increase in hygiene awareness for consumers and industries is expected to drive the increase in consumption of gloves globally.

- HARPS intends to address opportunities in China and Europe as part of its future plans.

2.3 Glove industry in Malaysia

- Malaysia is the world's largest exporter of gloves with an estimated 65% share of the global export market in 2020 (which is estimated at 213 billion gloves). Despite competition from Thailand and Indonesia who are major natural rubber producers, Malaysia remains the world's largest glove producing country. This is contributed by the ability of Malaysia's glove manufacturers to meet international quality standards of various importing countries, manufacturing capabilities including research and development, and sheer size of installed capacity. In addition, Malaysia has developed a base of supporting industries ranging from the supply of raw materials to the fabrication of plants and equipment.

Fig 5: Malaysia's export of gloves

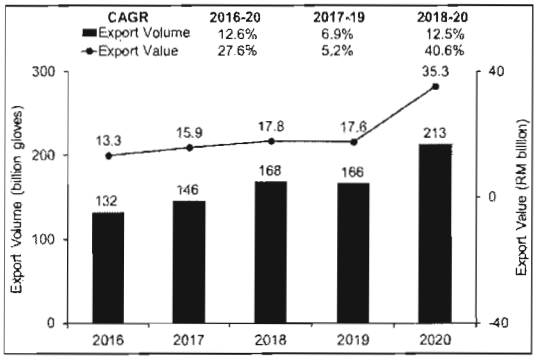
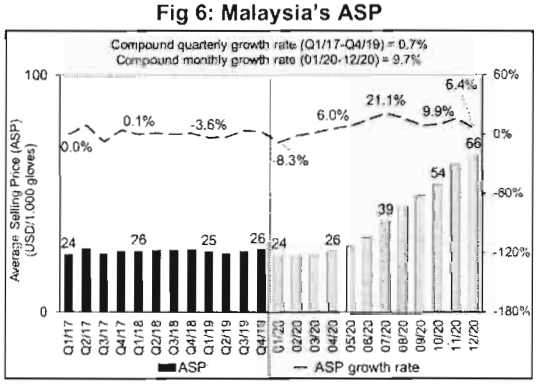


Fig 6: Malaysia's ASP

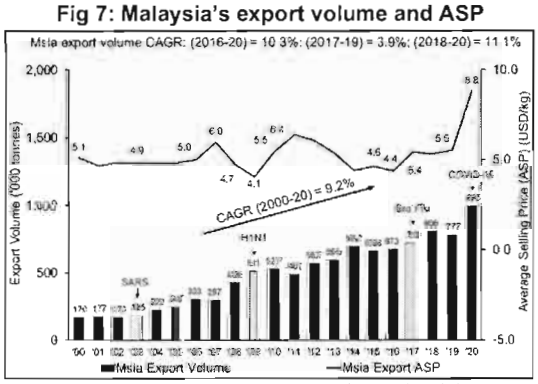


Sources: DOSM; Vital Factor analysis.

- Malaysia's export value of gloves grew at a CAGR of 40.6% from RM17.8 billion in 2018 to RM35.3 billion in 2020 while export volume grew at a CAGR of 12.5% from 168 billion gloves in 2018 to 213 billion gloves in 2020. Malaysia's export value and volume of gloves were higher compared to the global export value and volume of gloves at CAGR of 27.9% and 9.3% respectively between 2018 and 2020.

- The World Health Organisation (WHO) officially noted the occurrence of infections from coronavirus in December 2019 (COVID-19), and declared it a pandemic in March 2020. In 2020, Malaysia's export volume of gloves grew by 28.0%, from 166 billion gloves in 2019 to 213 billion gloves in 2020. Malaysia's ASP for gloves grew by 176% from USD24 per 1,000 gloves in January 2020 to USD66 per 1,000 gloves in December 2020, which translate to a compound monthly growth rate of 9.7% within this period. This was driven by the increase in demand due to the COVID-19 pandemic conditions. In November 2020, several vaccines had completed phase 3 clinical trials and were rolled out at the end of 2020.

Fig 7: Malaysia's export volume and ASP



Sources: DOSM; Vital Factor analysis. Malaysia's export value is in MYR and is converted to USD using the respective year's average exchange rate. Malaysia's export volume is reported in tonnes.

- Before COVID-19, Malaysia's export volume of gloves had been growing at a CAGR of 8.3% from 170,000 tonnes in 2000 to 777,000 tonnes in 2019. During the years of the severe acute respiratory syndrome (SARS) (2003), H1N1 (2009) and Bird Flu (2017), Malaysia's export volume increased by 8.8%, 19.4% and 7.0% respectively. In the following years after the

occurrences of the above virulent diseases, Malaysia's export volumes grew by 20.5% in 2004 (SARS), 3.1% in 2010 (H1N1) and 11.9% in 2018 (Bird Flu). In 2017, during the year of the Bird Flu outbreak, Malaysia's ASP of gloves increased by 23.3%. However, there were no corresponding increases in ASP during the occurrences of SARS (2003) and H1N1 (2009). According to WHO, the SARS (2003) and Bird Flu (2017) were classified as epidemics, while H1N1 (2009) and COVID-19 were classified as pandemics.

3 RAW MATERIALS

Fig 8: Malaysia's production of synthetic rubber*

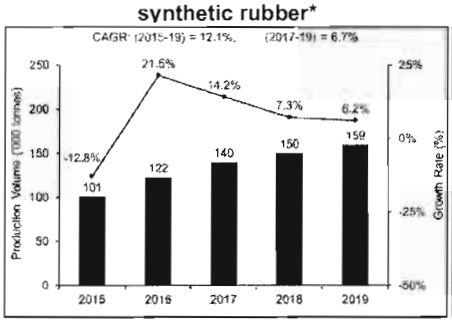
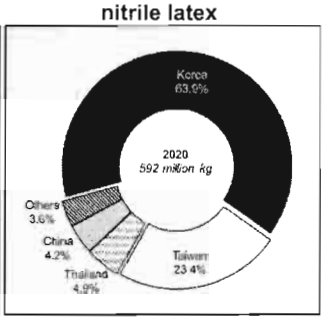


Fig 9: Malaysia's imports of nitrile latex



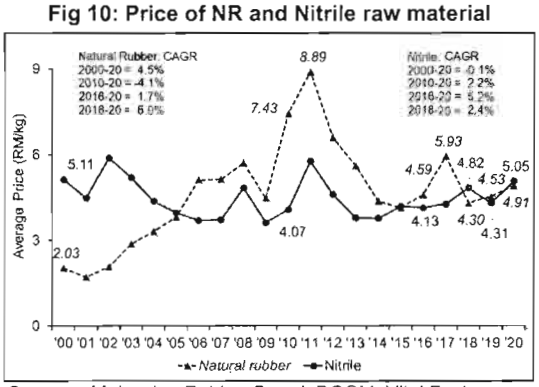
** Refers to dry rubber content. Sources: Malaysian Rubber Council (MRC); DOSM*

- Manufacturers of gloves rely on the supply of nitrile or NR depending on the type of gloves manufactured. As of end of January 2021, Malaysia has one nitrile manufacturer who increased their production capacity to 350,000 tonnes per year (with their recent 90,000 tonnes capacity expansion) in Pasir Gudang, Johor. The nitrile manufacturer in Pasir Gudang is expected to add 60,000 tonnes per year by the fourth quarter of 2021. In addition, there will be a new entrant planning to build a nitrile manufacturing plant in Malaysia with a production capacity of 200,000 tonnes per year. This plant is scheduled to commence production by 2023.

- Malaysia is primarily an importer of nitrile. The import value of nitrile increased at a CAGR of 11.2%, from RM2.0 billion in 2016 to RM3.0 billion in 2020 while import volume recorded a CAGR of 5.7%, from 474,795 tonnes in 2016 to 591,972 tonnes in 2020. *(Source: DOSM)*

- Between 2015 and 2019, consumption of NR and synthetic rubber in Malaysia recorded a CAGR of 1.2% and 3.2% respectively. In 2019, the production of latex products (rubber gloves, condoms, catheters and others) was a major rubber consumption sector. In 2019, the consumption of NR accounted for 51.2% (498,934 tonnes) while synthetic rubber accounted for the remaining 48.8% (475,076 tonnes). In the last 10 years, the consumption of synthetic rubber increased at a CAGR of 11.0% from 185,077 tonnes in 2010 to 475,076 tonnes in 2019. *(Source: DOSM; Malaysia Rubber Board)*

Fig 10: Price of NR and Nitrile raw material



Sources: Malaysian Rubber Board; DOSM; Vital Factor analysis.

- Generally, nitrile as a raw material constitutes about half the cost of gloves. Fuel is the second largest cost component, used for curing the gloves, followed by chemicals used to provide the properties and characteristics of gloves. The type, amount and proportion of chemicals added are the proprietary knowledge of manufacturers, followed by the manufacturing processes including the temperature and time taken for the curing process.

- In 2020, there was no significant difference between the cost of NR and nitrile despite their varying cost differences over the last 20 years. Compared to NR, the prices of nitrile were relatively more stable in the last 10 and 20 years, where the standard deviation of nitrile was 0.57 and 0.65, while NR was 1.46 and 1.72 respectively (a larger standard deviation means prices are more spread out). Although nitrile is made from crude oil, there was virtually no correlation between the price of crude oil and import price of nitrile in Malaysia between 2010 and 2020 at a coefficient of correlation of 0.04 (a coefficient of 1.00 indicates a perfect correlation, while a coefficient of 0.00 indicates no correlation). In 2013, the average crude oil price was USD104 per barrel and the import price of nitrile was RM3.78/kg, while in 2020, the average crude oil price was USD41 per barrel and the import price of nitrile was RM5.05/kg. *(Source: Vital Factor analysis)*

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4 COMPETITIVE LANDSCAPE

Competition in Malaysia

- In 2020, there were 57 glove manufacturing companies registered with the Malaysian Rubber Glove Manufacturers Association (MARGMA). The list of companies below was selected based on the following criteria:
  - Public listed company (PLC) or its subsidiaries with nitrile glove manufacturing facilities in Malaysia;
  - Availability of the latest financial information; and
  - Private companies with nitrile glove manufacturing facilities in Malaysia that have annual revenue of RM300 million and above in their latest available financial statements.

- The following is a list of glove manufacturers in Malaysia ranked in descending order of revenue:

Rank	Company	Year of est/incorp	Material^ NR	Material^ NBR	Type E	Type S	Inst Cap (bil glv)	FYE[1]	Rev[2] (RM mil)	GP[2] (RM mil)	GP Mgn[3] (%)	EBITDA[2] (RM mil)	EBITDA Mgn[3](%)	NP[2] (RM mil)	NP Mgn[3] (%)
1*	Top Glove Corp. Bhd[4]	1991	42%	47%	√	√	90.0	Aug'20	7,237	2,850	39.4	2,421	33.5	1,789	24.7
2*	Kossan Rubber Industries Bhd[5]	1979	21%	79%	√	√	29.0	Dec'20#	3,654	n.a.	n.a.	1,570	43.0	1,093	29.9
3*	Hartalega Holdings Bhd[6]	1981	√	97%	√	√	36.0	Mar'20	2,924	742	25.4	692	23.6	434	14.9
4*	Supermax Corp. Bhd[7]	1987	25%	72%	√	√	21.8	Jun'20	2,132	n.a.	n.a.	759	35.6	535	25.1
5*	Riverstone Holdings Ltd[8]	1991	3%	95%	√	√	9.0	Dec'20#	1,830	898	49.1	894	48.9	647	35.4
6	YTY Industry Holdings S/B[9]	1988	√	√	√	√	17.0	Dec'19	1,503	225	15.0	227	15.1	109	7.2
7	**HARPS Holdings Bhd**	2015	nil	100%	√	nil	**8.0**	**Dec'20**	**1,218**	**664**	**54.5**	**680**	**55.8**	**514**	**42.2**
8*	Comfort Gloves Bhd[10]	1993	13%	87%	√	nil	4.2	Jan'21#	946	407	43.0	401	42.4	287	30.4
9	Latexx Partners Bhd[11]	1987	√	√	√	nil	9.0	Dec'19	753	n.a.	n.a.	-147	-19.6	-183	-24.3
10*	Careplus Group Bhd[12]	1988	69%	26%	√	√	4.1	Dec'20#	476	135	28.5	168	35.3	122	25.8
11*	Rubberex Corp. (M) Bhd[13]	1987	√	42%	√	nil	0.2	Dec'20#	416	174	41.8	n.a.	n.a.	131	31.5
12	Smart Glove Holdings S/B[14]	1997	√	√	√	√	4.4	Sep'19	327	51	15.7	34	10.5	7	2.2

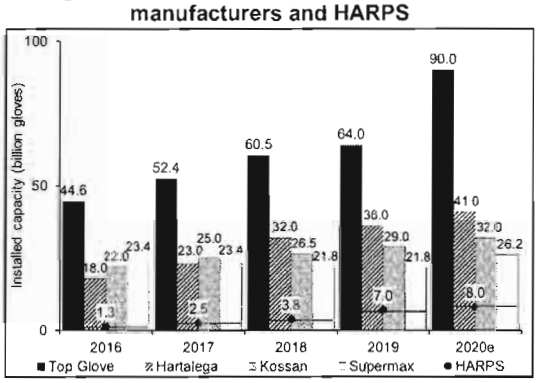
^ Based on proportion of sales volume or revenue or production volume. * PLC or subsidiary of PLC; # = based on unaudited financial statements of PLC announced on Bursa Malaysia Berhad's website; est = establishment; incorp = incorporation; E = exam gloves; S = surgical gloves; Inst Cap = Installed capacity; bil glv = billion gloves; FYE = financial year ended; Rev = revenue; GP = gross profit; Mgn = margin; NP = net profit; mil = million; n.a. = not available; Ltd = limited; S/B = Sdn Bhd

1) Latest available financial information from annual reports of PLC or unaudited financial statements of PLC announced on Bursa Malaysia Berhad's website, and audited financial statements of private companies from the Companies Commission of Malaysia (CCM) and HARPS.

2) Revenue, GP, net profit and EBITDA were derived from the manufacture of rubber gloves as well as other business activities. The vast majority were derived from the manufacture of rubber gloves. EBITDA = net profit + interest + tax + depreciation + amortisation.
3) Gross Profit/EBITDA/Net profit divided by the Group's revenue for the latest financial year.
4) Holding company for Top Glove S/B, TG Medical S/B, Top Quality Glove S/B, GMP Medicare S/B, Flexitech S/B, Adventa Health S/B, Terang Nusa (Malaysia) S/B, Purnabina S/B, and Sentienx S/B.
5) Holding company for Perusahaan Getah Asas S/B, Kossan Latex Industries (M) S/B, Ideal Quality S/B, and Wear Safe (Malaysia) S/B.
6) Holding company for Hartalega S/B and Hartalega NGC S/B.
7) Holding company for Supermax Glove Manufacturing S/B, Maxter Glove Manufacturing S/B and Maxwell Glove Manufacturing Berhad.
8) A listed entity on the Singapore Stock Exchange and the holding company for Riverstone Resources S/B, Eco Medi Glove S/B (Malaysia), and Protective Technology Co. Ltd.
9) Holding company for YTY Industry S/B, Green Prospect S/B and Global Surgical Supply S/B.
10) Holding company for Comfort Rubber Glove Industries S/B.
11) Holding company for Latexx Manufacturing S/B.
12) Holding company for Careplus (M) S/B, Rubbercare Protection Products S/B, and Careglove Global S/B.
13) Holding company for Rubberex (M) S/B, Diamond Grip (M) S/B and Rubberex Alliance S/B.
14) Holding company for GX Corporation S/B, Platinum Glove Industries S/B and Sigma Glove Industries S/B. Excluded Smart Glove Corporation S/B which has been deconsolidated in FYE 30 September 2019.

- The "top four Malaysian manufacturers" (Top Glove, Hartalega, Kossan and Supermax) increased their collective installed capacity by a CAGR of 15.0% from 108 billion gloves in 2016 to 189 billion gloves in 2020. HARPS' installed capacity increased by a CAGR of 57.5% from 1.3 billion gloves in 2016 to 8.0 billion gloves in 2020. In 2020, the top four Malaysian manufacturers were estimated to account for 71% of the country's total volume of glove exports and 46% of the world's total volume of glove exports.

Fig 11: Installed capacity of top 4 Malaysian manufacturers and HARPS



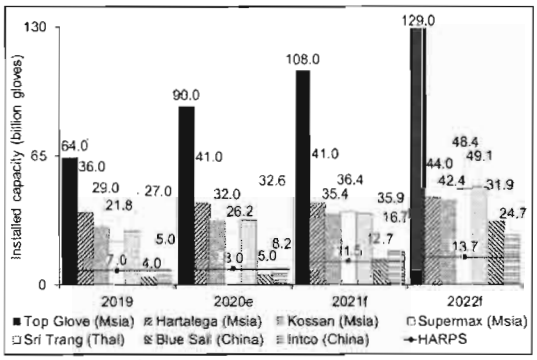
e = estimates. Sources: Annual reports and company briefings; HARPS; Vital Factor analysis. (Note that production output is normally lower than installed capacity.)

- The top four Malaysian manufacturers are expected to increase their collective installed capacity by a CAGR of 18.1% between 2020 and 2022 to reach a collective total of 264 billion gloves in 2022. HARPS' installed capacity is expected to increase by a CAGR of 30.9% between 2020 and 2022 to reach 13.7 billion gloves in 2022.

Competition from Foreign Countries

- Glove manufacturers in Malaysia face competition from manufacturers in other countries. Thailand, the largest producer of NR, is the second largest exporter of gloves after Malaysia. Sri Trang Gloves (Thailand) Public Company Ltd (Sri Trang) is the largest glove manufacturer in Thailand, with an installed capacity of 32.6 billion gloves in 2020 and is expected to reach 49.1 billion gloves by 2022. While Thailand has the comparative advantage of being the world's largest producer of NR, the trend is fast moving towards nitrile gloves, therefore Thailand's comparative advantage has eroded from this perspective.

Fig 12: Malaysia, Thailand and China manufacturers



e = estimates; f = forecast. Sources: Annual reports and company briefings of PLC; HARPS; Vital Factor analysis. The installed capacity of Blue Sail and Intco are for manufacturing of nitrile gloves only.

- China was the third largest exporter of rubber gloves in the world in 2019. Given the rising demand for rubber gloves, two large glove manufacturers in China, namely Blue Sail Medical Co., Ltd (Blue Sail) and Shandong Intco Medical Technology Co Ltd (Intco), are embarking on an

expansion of their nitrile glove installed capacity. The collective installed capacity of these two large manufacturers of nitrile gloves was estimated at 13.2 billion gloves in 2020 and is expected to reach 56.6 billion gloves by 2022, equivalent to a CAGR of 107% between 2020 and 2022.

- Over the last five years, there has been a gradual switch from the production of NR gloves to nitrile gloves. The production of nitrile gloves of the top four Malaysian manufacturers increased from approximately 53% in 2016 to 67% of their total production collectively in 2020. Besides, Blue Sail and Intco who are predominantly focused on vinyl gloves are also expanding their nitrile glove production capacities.

5 BARRIERS TO ENTRY, RISKS, THREATS AND CHALLENGES

- The key barriers to entry into the glove industry are as follows:

  - **Start-up costs:** In Malaysia, the estimated cost of entry is approximately RM120 million for a manufacturing plant with an output of one billion gloves per annum. This comprises the cost of construction of building, installation of production lines, as well as land and working capital. For a new entrant, the time required to construct a new facility would take approximately one to 1.5 years, the variable being the time required to obtain all the necessary environmental, construction, building and operational permits, licences and approvals. For an existing player with approved land, it would take approximately nine months to one year from commencement of planning to production.

  - **Technical skills and knowledge:** The manufacture of gloves requires technical expertise to meet the needs of the specific industry, customers' specifications and requirements, and regulatory compliance for product certification and registration. Some of the key technical skills and knowledge include the formulation of raw materials and additives, and production processes to achieve different properties and characteristics of gloves such as thickness, elongation, modulus of elasticity, tensile strength, break force, and resistance to puncture, chemicals, abrasion and high temperature.

  - **Product certification and registration:** The quality of gloves especially medical grade gloves also serve as a barrier to entry in meeting foreign regulatory requirements. As gloves are classified as medical devices, there is a need to obtain product certification and registration in destination countries of export. This would form a barrier to new entrants as they will need to undergo product development to meet the criteria for product certification and registration of the countries of intended export.

  - **Market entry:** Networks of resellers, distributors or sales centres in various foreign countries will also form a barrier to entry as gloves are commonly sold across several countries in large volumes.

- While the above constitute barriers to entry, they are not overly onerous and as such, barriers to entry for the manufacture of gloves is moderate. This is supported by the observation that 57 glove manufacturers in Malaysia were registered with MARGMA in 2020.

- Some of the industry risks, threats and challenges facing Malaysian glove manufacturers include competitive intensity, shortage of labour and dependency on foreign workers, fluctuations in exchange rates, import bans by foreign countries, temporary suspension of operation at manufacturing facilities due to COVID-19 outbreak, and excess capacity of glove manufacturing in the medium to long term. In addition, the shortage of raw materials and increasing prices of raw materials are also risks faced by Malaysian and foreign glove manufacturers, particularly in the short to medium term.

6 GOVERNMENT REGULATIONS, PRODUCT CERTIFICATION AND REGISTRATION

- According to the Malaysian Rubber Board (Licensing and Permit) Regulations 2014, manufacturers of rubber gloves are required to obtain a licence to buy and store rubber for the manufacture of rubber products as well as an export licence for the export of rubber gloves. Medical gloves including exam and surgical gloves are classified as medical devices and are therefore subject to various foreign standards and government regulations, certifications, registrations and licences of importing countries including, among others, the FDA, European Union Medical Devices, Ministry of Health, Labour and Welfare of Japan, Health Canada, Australian Therapeutic Goods Administration, and China's National Medical Products Administration.

- In addition to the requirement for continuous product registration, some of the foreign countries have alert systems, such as the US, where imports of gloves may be placed on an alert list due to quality or other issues. Products on the alert list are either forbidden to enter the country or are subject to the increased number of non-violative shipments before entry is allowed into the country. Nevertheless, such manufactures may make good any faults and can be taken off the alert list once their products comply with the requirements of the authorities or resolution of the original issue. Some of the reasons for products to be placed on the alert list include unacceptable product quality, poor labour practices and welfare of workers, and operations that harm the environment.

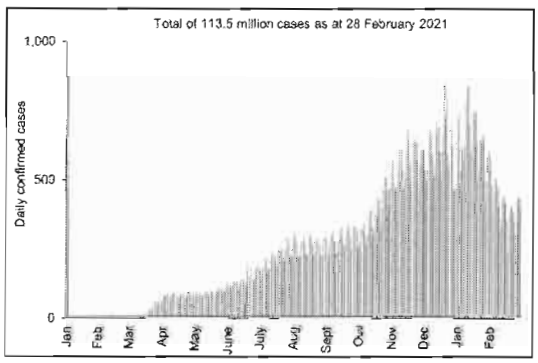
7 DRIVERS AND IMPEDIMENTS TO GROWTH

- The key **drivers of growth** in demand for gloves include the following:

  - The global export volume of gloves grew at a CAGR of 5.7% between 2000 and 2019 before the COVID-19 pandemic. This was contributed by the following factors, which will also continue to sustain growth in the longer-term:
    (a) continuing increase in the usage of gloves as a protective barrier in the healthcare sector;
    (b) growing global and ageing population which increase the demand for healthcare services;
    (c) increase in hygiene awareness in non-healthcare sectors such as hospitality, food services and personal care;
    (d) Increase usage of gloves in industries such as pharmaceutical, biotechnology, semiconductor and other manufacturing sectors; and
    (e) outbreaks of virulent diseases such as SARS, H1N1 and Bird Flu.

  - **The continuing COVID-19 pandemic** is expected to further drive the demand for gloves at least in the short term. As of 28 February 2021, COVID-19 was estimated to have affected 113.5 million people in 237 countries with 2.5 million fatalities globally *(Source: WHO)*. The pandemic is expected to continue to be a global health issue in 2021 and possibly 2022, even though vaccines have begun to be rolled out at the end of 2020. As of 15 February 2021, at least seven vaccines have been rolled out and 175.3 million doses have been administered *(Source: WHO)*. In 2020, global demand for gloves was estimated to exceed supply by 120% primarily contributed by the COVID-19 pandemic. It is expected that the level of unmet demand will sustain growth in the production of gloves up to 2023. *(Refer to Section 8 of this report for more details.)*

Fig 13: Global daily confirmed cases of COVID-19



Source: WHO

  - **Growth opportunities from low glove consumption per capita countries.** In 2019, the collective population of the selected low glove consumption per capita countries (Brazil, China, Egypt, Mexico, India and Pakistan) was approximately three billion people with a collective average consumption of 14 gloves per capita. In contrast, the collective population of the selected high consumption countries (US, UK, Germany, Italy, Japan and France) was 0.7 billion people with a collective average consumption of 188 gloves per capita in 2019. *(Refer to Fig 4 for more details.)*

  - **Increased consumption from additional user industries** including hotels, airlines, food services, personal care and beauty, and many other industries due to COVID-19. It is envisaged that demand for gloves will be moderated post-COVID-19, however, production output will not drop to pre-COVID-19 levels. This is mainly due to the increase in hygiene awareness for many consumers and industries. The current COVID-19 pandemic has also caused many organisations to mandate the use of gloves as a standard operating procedure. This assumption is supported by Malaysia's experience in its exports of gloves during the outbreaks of SARS, H1N1 and Bird Flu. *(Refer to Fig 7 for more details.)*

- **Stockpiling of critical medical supplies** including gloves in several countries such as the UK, Canada and the US (Strategic National Stockpile) is expected to be a driver of growth for some time. A significant proportion of these countries' stockpile of gloves would have been depleted by the current COVID-19 pandemic. The replenishment and continuing emphasis on stockpiling will help to sustain the demand for gloves.

- The key drivers of growth in **ASP** of gloves include the current unmet demand, lack of substitutes for gloves as an essential medical device, and increase in the price of raw materials due to the current raw material shortage. In December 2020, the ASP of gloves in Malaysia grew by 176% compared to January 2020, which translates to a compound monthly growth rate of 9.7% within this period. *(Refer to Fig 6 for more details)*

- Some of the factors that will **moderate** growth in demand and ASP include the following:

  - In the longer term, the wide availability and use of effective vaccines and treatments for COVID-19 will moderate growth in glove production and ASP.

  - The increase in capacity for gloves and raw materials will drive down the ASP of gloves, thus moderating the market size in monetary terms.

  - Increased awareness of environmental concerns relating to single-use glove. NR and nitrile gloves take many years to disintegrate and fill up landfills. Gloves also use a significant amount of energy to manufacture, which contributes to greenhouse effects.

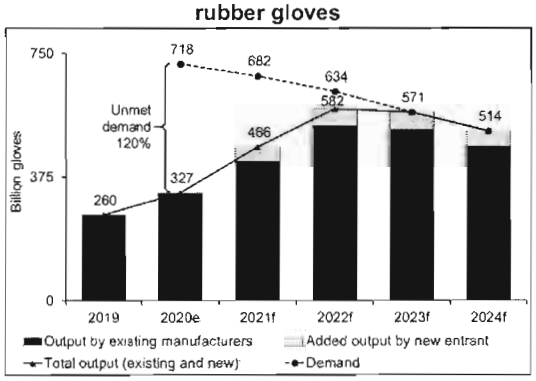
  - The increasing ASP of gloves may create affordability issues particularly in the non-healthcare sectors where this may consequentially reduce the use of gloves or users may seek other affordable alternatives such as vinyl gloves.

8 FORECAST DEMAND AND SUPPLY

- Between 2020 and 2023, the global supply of gloves is forecasted to grow at a CAGR of 20%, from 327 billion gloves to 571 billion gloves by 2023. This is significantly higher compared to pre-COVID-19 period with a CAGR of 5.7% in global export volume between 2000 and 2019.

- In 2020, the global supply of gloves is estimated at 327 billion gloves, a growth of 26% compared to the previous year. The increase in global supply in 2020 was mainly contributed by the increase in demand arising from the COVID-19 pandemic supported by an increase in installed capacity and higher utilisation rate of capacity from manufacturers.

Fig 14: Forecast global supply and demand of rubber gloves



e = estimates; f = forecast. Supply is based on production output. Source: Vital Factor analysis.

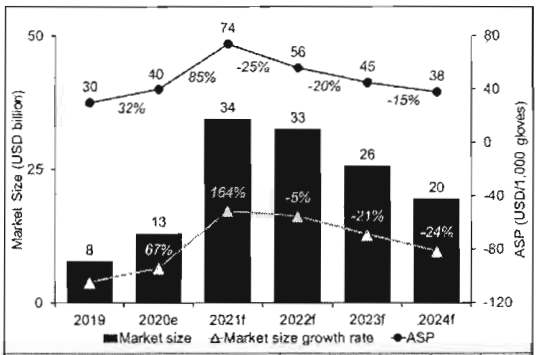
- In 2021, global supply is forecasted to grow by 43%, driven mainly by existing manufacturers, and new entrants coming onstream. The output from the top four Malaysian manufacturers is expected to grow by 32%, while output from Thailand's largest manufacturer, Sri Trang and China's two large manufacturers, Blue Sail and Intco (herein referred to as "three large foreign manufacturers") is forecasted to collectively grow by 60% in 2021. In 2022, global supply is forecasted to grow by 25%. This will be driven by the increase in the collective output of the three large foreign manufacturers by 62%, while the top four Malaysian manufacturers are forecasted to increase their collective output by 19% compared to 2021. The collective output of the top four Malaysian manufacturers and the three large foreign manufacturers is forecasted to represent 41% and 16% of the total global supply respectively in 2022. By 2023, it is forecasted that there will be a surplus in production capacity exceeding demand by 18%, followed by a 49% surplus in production capacity by 2024.

- The methodology to forecast demand is based on unmet demand or backlog of orders from major producers of gloves in Malaysia, which ranged from 365 days to 516 days in 2020 and extrapolated to the global scenario. *(Source: Vital Factor analysis)* Demand is forecasted to drop between 2021 and 2024 mainly due to the rollout of vaccines at the end of 2020. It is forecasted that production output will meet demand sometime in 2023, and will see a further drop in demand in 2024 causing higher excess production capacity compared to 2023. *(Refer to Fig 14 for further details)*

- The key drivers of growth in ASP of glove include the current unmet demand, lack of substitutes for gloves as an essential medical device, and increase in the price of raw materials due to the current raw material shortage. ASP is forecasted to trend higher in 2021 and gradually reduces due to increases in the production of gloves and the impact of the rollout of COVID-19 vaccines.

- It is envisaged that post-COVID-19 ASP will not fall back to pre-COVID-19 ASP. This is mainly substantiated by observations from the two latest outbreak of virulent diseases namely H1N1 (2009) and Bird Flu (2017) where the ASP grew by 15.5% and 21.5% respectively post-outbreak compared to pre-outbreak levels. The increase in ASP is expected to be higher than H1N1 and Bird Flu as COVID-19 was estimated to have affected 113.5 million people in 237 countries with 2.5 million fatalities globally as of 28 February 2021 *(Source: WHO).*

Fig 15: Forecast global market size and ASP



	2020	2021	2022	2023	2024
Unmet demand *(billion gloves)*	391	216	52	0	0
Excess production capacity *(billion gloves)*	0	0	0	101	254

e = estimates; f = forecast. Source: Vital Factor analysis.

Box 1: The methodology in forecasting supply was based on forecasting installed capacity from existing manufacturers and new entrants up to 2024, as well as increase in utilisation rate of installed capacity. New installed capacity from existing manufacturers was based on information from the top four Malaysian manufacturers and the three large foreign manufacturers, where in 2020 their collectively output amounted to approximately 57% of total global export volume. This was then extrapolated to the global scenario.

The installed capacity from new entrants was based on Malaysian companies planned capacity rollout and extrapolated to the global scenario. New entrants were not expected to contribute to supply till approximately mid-2021 due to the lead time required to build capacity. New entrants were envisaged to contribute less than 10% of total global export volume once they come fully onstream.

Forecasted market size was based on ASP multiplied by production output. Our methodology in forecasting ASP took into consideration the increase in ASP in 2020, rollout of COVID-19 vaccines and forecasted unmet demand and increase in production of gloves.

9 MARKET SIZE, SHARE OF GLOVE MANUFACTURING

- In 2020, HARPS was ranked among the top 10 largest glove manufacturers in Malaysia based on revenue. HARPS' market shares for 2020 were as follows:

Fig 16: Market size and HARPS' market share

	Market size in 2020 (1)			HARPS' market share in 2020 (2)		
	Global total glove	Malaysia total glove	Malaysia nitrile glove	Global total glove	Malaysia total glove	Malaysia nitrile glove
Volume	327 billion gloves	213 billion gloves	142 billion gloves	2%	3%	5%
Value	USD13.0 billion	RM35.3 billion	RM23.0 billion	2%	3%	5%

(1) Market size is based on export value and volume of gloves. (2) In 2020, HARPS' revenue was RM1,218 million (USD294 million) and sales of 7.2 billion gloves. *(Sources: DOSM; HARPS; Vital Factor analysis)*