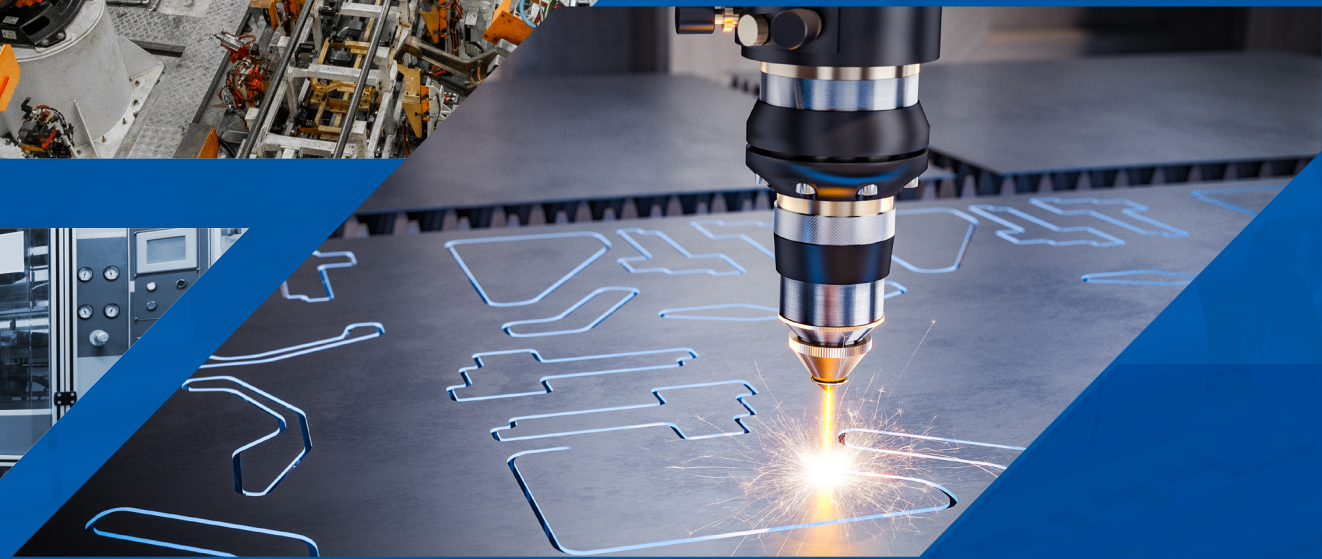




MALAYSIA'S MACHINERY & EQUIPMENT AND ENGINEERING SUPPORTING INDUSTRIES



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MALAYSIA'S MACHINERY & EQUIPMENT (M&E) AND ENGINEERING SUPPORTING INDUSTRIES

From humble beginnings in servicing equipment for the resource and agriculture-based industries in the 1970s, Malaysia's Machinery and Equipment (M&E) industry has grown by leaps and bounds in its short history. Today, the sector is a significant contributor to the country's GDP and stands ready to play a major role in helping to transform the M&E industry within the ASEAN region.

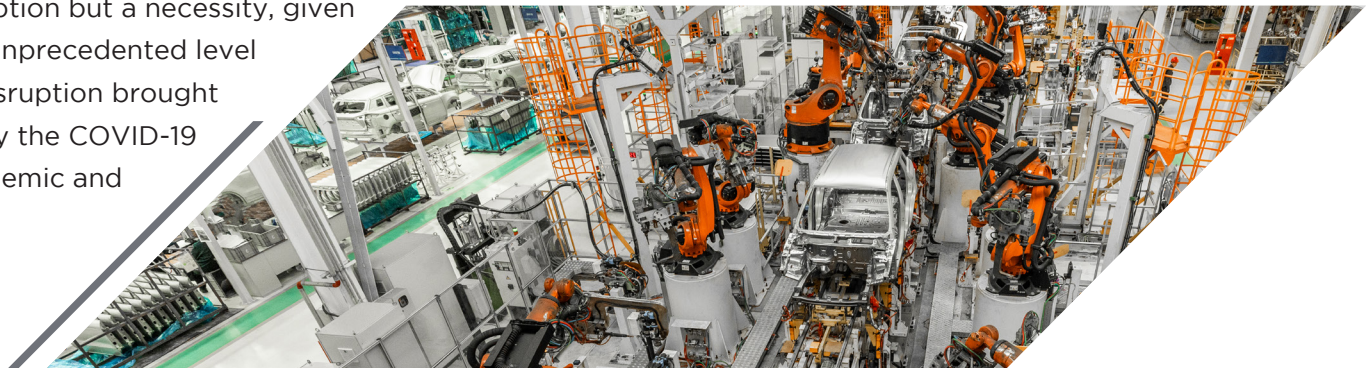
Owing to its linkages to various large-scale economic sectors, such as manufacturing, construction and services, Malaysia's M&E industry has catalysed the country's transition into a high-technology nation that is ready for Industry 4.0 and has enabled the production of a wide range of goods that combine electronics, advanced materials and software integration.

The highly competitive M&E industry is consistently striving to innovate new production systems and provide integrated solutions with the most advanced technologies and automation. Today's industry players are focusing their capabilities on producing high-value-added and high-tech machinery and equipment, with an emphasis on conducting modules manufacturing, research and development (R&D), and design and development (D&D) activities for low-volume, high-complexity and high-mixed products.

Leveraging technology to develop better business practices and approaches has never been more urgent. Automation is no longer an option but a necessity, given the unprecedented level of disruption brought on by the COVID-19 pandemic and

movement restrictions. Malaysia's M&E industry is well-poised to ramp up innovation, automation and smart manufacturing to increase productivity and stay competitive.

Malaysia's capabilities in the robotics and factory automation sub-sectors hold much promise for investors. We are home to approximately 120 major companies that produce advanced, fully automated handling systems that incorporate intelligent robotics and Machine-to-Machine (M2M) communication. Prospective investors are invited to consider financing the research and commercialisation of disruptive technologies related to automation and digitalisation for a much-needed boost for business continuity.



AREAS OF OPPORTUNITY

The United Nations Standard International Trade Classification categorises the M&E industry into four main sub-sectors, each offering investors invaluable prospects for growth, both in Malaysia and by extension, within ASEAN:



Specialised machinery or equipment for specific industry



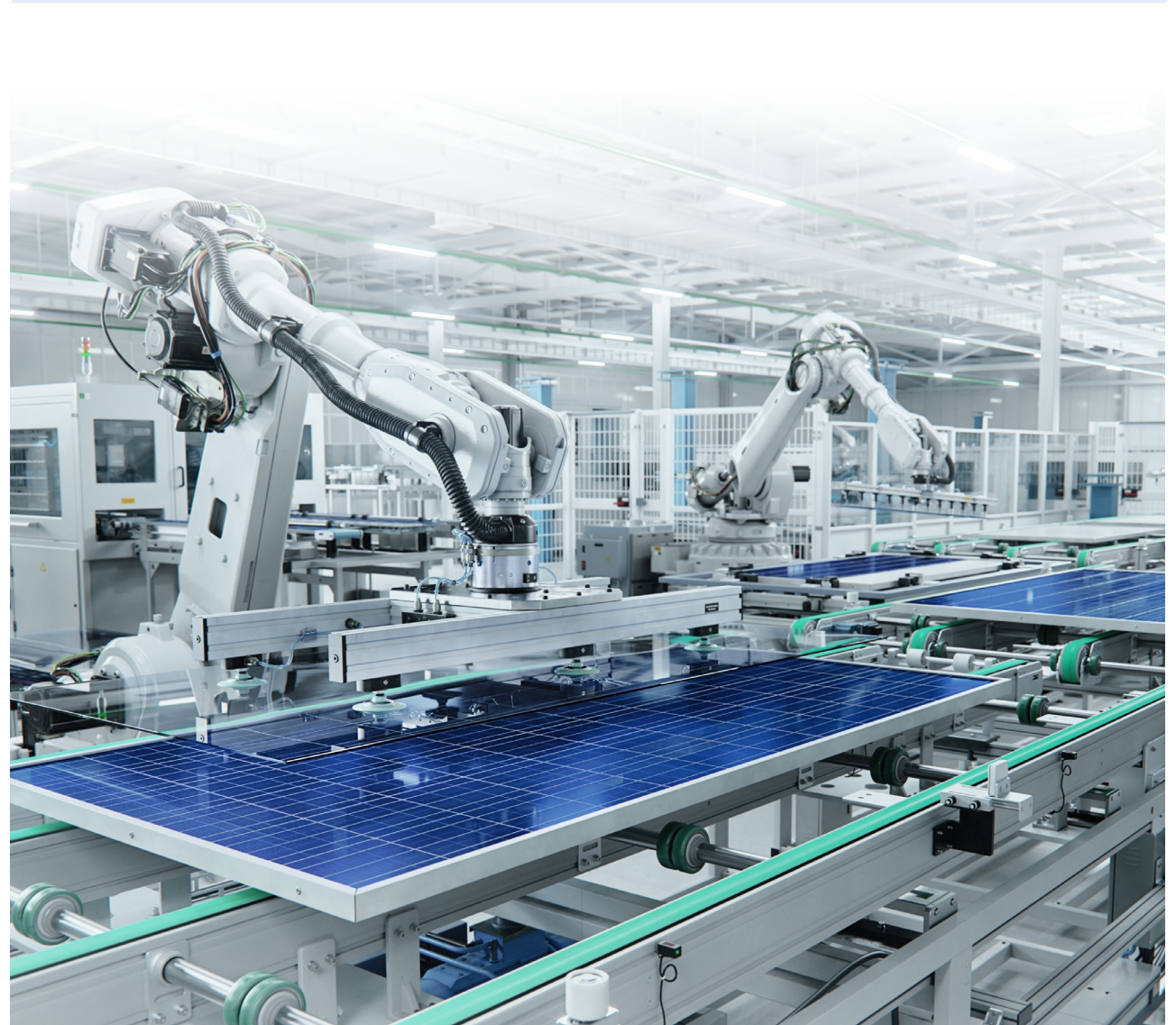
Metal working machinery and equipment



Power generating machinery and equipment



General industrial machinery and equipment, components and parts



SPECIALISED MACHINERY OR EQUIPMENT FOR SPECIFIC INDUSTRY

This sub-sector focuses on machinery or equipment that is specially designed and customised for use in a specific sector or process. Targeted industries include semiconductor, electrical and electronics (E&E), solar/photovoltaic, oil and gas, automotive, packaging, plastic extrusion and injection, and agriculture. This sub-sector has attracted top global and capable local manufacturers, providing vast opportunities for growth.

- ▶ Malaysia has attracted some of the world's leading companies in the front-end semiconductor sector such as LAM Research, Ultra Clean Technology (UCT) and COMET.
- ▶ Malaysian M&E manufacturers have the advantage of producing high quality customised machinery with competitive pricing to meet international standards.

- ▶ In the packaging sector, there is an increased demand from the pharmaceutical and medical devices industries for automated specialised packaging machines. To meet the medical industry's needs, a well-designed packaging machine in a cleanroom environment would provide effective sealing against bacteria and facilitate the aseptic requirements of the packaged product. Local manufacturers have the capacity to provide various industrial packaging solutions for liquid, powder and other industrial products, including bottling, sealing, filling, wrapping, boxing, cartoning and shrink-wrapping machines.



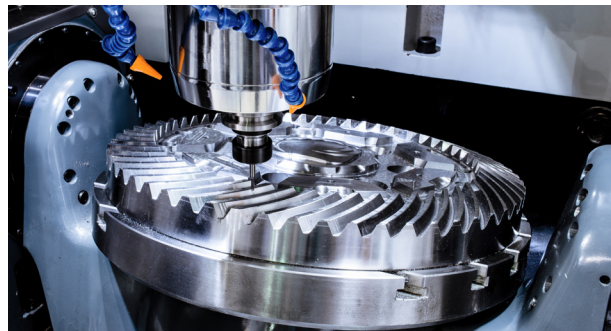
- ▶ The increasing mechanisation of the agriculture sector has created vast investment opportunities for local M&E manufacturers. Agricultural M&E manufactured or assembled by local companies include rotavators, rotaslashers, fertilizer spreaders, tractors, mulchers, poultry rearing and processing equipment, and egg cleaning, grading and packing machines.



METALWORKING MACHINERY AND EQUIPMENT

This sub-sector offers opportunities in the manufacture of laser cutting machines, machining centres, electro-discharge machines (EDM), milling machines, drilling machines, lathes, shearing machines, bending rolls, stamping machines, press brakes, forging machines and presses. The Government is also placing emphasis on the manufacture of high technology, numerical control (NC) and computer numerical control (CNC) machines, as well as encouraging companies in the metalworking machinery sub-sector to set up training, reconditioning, upgrading, sales and distribution centres to support their customers in this region.

- ▶ A number of Malaysian and Malaysian/foreign joint-venture companies are currently undertaking the manufacturing of metalworking machinery for various industrial users such as those in the automotive, E&E as well as other engineering supporting sectors.
- ▶ Local company, Sunfluid Engineering manufactures various types of hydraulic machines, with a press capacity ranging from 20 to 3,000 tonnes for the local market and for export to ASEAN countries, Saudi Arabia and Japan.



- ▶ AIDA, a world-renowned Japanese metal forming system builder, manufactures high-precision, single- and double-crank mechanical and servo presses from 80 to 300 tonnes. It exports 90 per cent of its products to Asia Pacific, North and South America and Europe.



POWER GENERATING MACHINERY AND EQUIPMENT

This sub-sector mainly focuses on boilers, condensers, electric generating sets, turbines, and engines. While most boilers are manufactured for local demand, they are also exported to neighbouring countries such as Indonesia, Philippines, Thailand, and Cambodia. There is also room for growth for local players in the reconditioning or refurbishing of power generating equipment such as industrial turbines and generators.

► Malaysia is currently the largest manufacturing hub for boilers in Southeast Asia. Boilers are manufactured for various industries such as oil and gas, oleochemicals, petrochemicals, food and beverage, palm oil, rubber, wood, textile and hospitals.

- Local producers have the capabilities to manufacture internationally acclaimed products and supply industrial boilers such as utility boilers, water tube boilers, fire tube boilers, package boilers and combination boilers.
- Generating sets are also being produced for power plants, refineries, exploration platforms, petrochemical plants and commercial buildings and are exported to countries such as Singapore, Cambodia and Korea.



- The power generating M&E sector in Malaysia is projected to be among the fastest growing, driven by increasing energy demands from the expansion of facilities and operations across various industries.



GENERAL INDUSTRIAL MACHINERY AND EQUIPMENT, COMPONENTS AND PARTS

This largest M&E sub-sector, with over 500 local and foreign companies, covers a broad category of products such as air-conditioning plants, cold room equipment, elevators, cranes, conveyor systems, pumps, compressors, welding machines, fans and blowers, heat exchangers, pressure vessels, filtering equipment, valves, bearings, gears and actuators.

▶ Malaysia is recognised as a major supplier of high-speed heavy lifting tower cranes, oil and gas pedestal cranes, process automation systems and heating, ventilation and air conditioning (HVAC) units. It is also currently one of the largest exporters of air conditioning equipment.

▶ Within this sub-sector, automated material handling equipment (AMHE) and factory automation are gaining traction as the manufacturing sector moves towards Industry 4.0 and smart manufacturing. AMHE and factory automation are critical factors in the adoption of smart manufacturing to help increase workflow efficiency and enhance product quality.



M&E INDUSTRY EXPORTS AND IMPORTS

The value of Malaysia's M&E exports increased from RM37.7 billion in 2016 to RM60.45 billion in 2022, showcasing the industry's robust growth that was anchored by companies focusing on high-tech products such as semiconductors, intelligent machines, advanced metrology and analytical laboratory equipment, robotics and autonomous guided (self-driving) vehicles. Export destinations included Singapore, the USA and Japan.

The majority of M&E imports were advanced, high-tech machines and some general machinery and equipment that were not available locally. Top import sources for Malaysia's M&E industry were China, Japan, USA, Germany and Singapore.

The growth of Malaysia's M&E industry is driven by the continuous inflow of both foreign direct investments and domestic direct investments in various sectors, with the semiconductor, E&E, automotive, oil and gas, aerospace, medical and food processing among the major ones. The need for high-technology machinery and equipment in these sectors is key to their survival in a highly competitive global environment.

Data provider IHS Markit forecasts Malaysia's M&E industry to grow at 10.1 per cent per annum between 2018 and 2027. Not only will M&E production continue to be a field of interest for foreign investment, other areas of the value chain also provide opportunities for profitable investment. Alongside maintenance, repair and overhaul (MRO), service is also expected to be in high demand due to the high density of plants and M&E installations in this region.

SUB-SECTORS	2022 EXPORTS RM BIL (US\$ BIL)**	MAJOR DESTINATIONS	2022 IMPORTS RM BIL (US\$ BIL)**	MAJOR SOURCES
POWER GENERATING M&E	3.0 (0.68)	Singapore, USA, Japan, Germany, UK	13.9 (3.15)	USA, Japan, Singapore, China, Thailand
SPECIALISED MACHINERY OR EQUIPMENT FOR SPECIFIC INDUSTRY	29.4 (6.66)	Singapore, USA, Japan, Indonesia, Thailand	32.4 (7.34)	Japan, Germany, USA, Taiwan, Singapore
METALWORKING MACHINERY AND EQUIPMENT	2.0 (0.45)	Singapore, Hong Kong, Japan, USA	5.1 (1.15)	Japan, Germany, USA, Taiwan, Singapore
GENERAL INDUSTRIAL M&E, COMPONENTS AND PARTS	25.9 (5.87)	Singapore, Hong Kong, Japan, USA, Australia	37.8 (8.57)	Japan, USA, Germany, Singapore, Taiwan
TOTAL	60.4 (13.6)		89.3 (20.2)	

**US\$1=RM4.41 | USD Billions | Source: <https://metsonline.dosm.gov.my/>

INCENTIVES

To enhance growth and encourage investments in the M&E industry, the Government offers:

NORMAL TAX INCENTIVES

- Pioneer Status with a tax exemption of 70% on statutory income for a period of five years, or
- Investment Tax Allowance (ITA) of 60% on qualifying capital expenditure incurred within a period of five years. This allowance can be offset against 70% of the statutory income for each year of assessment.



REINVESTMENT ALLOWANCE

60% on qualifying capital expenditure for 15 years



IMPORT DUTY EXEMPTION

For machinery and equipment, raw materials and components



SUB-SECTORS TARGETED FOR SPECIAL INCENTIVES

- Machine tools
- Material handling equipment
- Robotics and factory automation equipment
- Packaging machinery
- Specialised process machinery or equipment for specific industry
- Modules and components of the above



SPECIAL TAX INCENTIVES

- Pioneer Status with a tax exemption of 100% on statutory income for a period of 10 years, or
- Investment Tax Allowance (ITA) of 100% on qualifying capital expenditure incurred within a period of five years. This allowance can be offset against 100% of the statutory income for each year of assessment.



INDUSTRY LEADERS

Malaysia's M&E industry is among the largest and strongest in ASEAN, providing customised products such as end-to-end manufacturing and total solutions, from design to logistics, to meet strong demand from both domestic and international manufacturing industries. An estimated of 120 major companies are capable of producing state-of-the-art machinery and equipment integrated with Industry 4.0 technologies for various industries.

In 2010, there were 25 local automation and technology equipment companies in Malaysia, with a total market value of RM234 million. In 2022, more than 50 automation companies were in operation, with the top 10 companies having a total market capitalisation of more than RM27 billion.

The M&E industry, with its high-technology manufacturing and modern services sectors, requires high-skilled talents who command wages between RM3,000 to RM5,000. This industry is centred on R&D/D&D and high integration and customisation, which are highly dependent on skilled manpower. Generally, M&E projects provide more than 70% of employment opportunities at managerial, supervisory and technical levels. As such, it is generally not a capital-intensive industry.

Malaysia hosts world-renowned, advanced and sophisticated M&E manufacturers such as AIDA (Japan), VAT (Switzerland), COHU (USA), SKF (Sweden), Bromma (Sweden), Besi (the Netherlands), Lam Research (USA), Bruker (USA), Towam (Japan) and ASM (Singapore).

Malaysian-owned companies have also grown and established themselves as internationally recognised providers of advanced machinery and equipment. These include ViTrox, Pentamaster, ACM, Greotech Integration, Genetec Technology, Cheng Hua Engineering Works, TXMR, Vepro Group and XTS Technologies. These companies offer total integrated solutions in material handling and automation.

SUCCESS STORIES



SUCCESS STORIES

LAM RESEARCH



A global leader in semiconductor manufacturing, this US Fortune 500 company announced an investment to build a high-tech manufacturing factory in Penang, Malaysia, adding to its existing global production footprint with locations in the United States of America, South Korea and Austria. LAM's products are used to make microchips found in electronic devices such as cell phones, laptops, digital cameras, and cars. Today, nearly every advanced microchip in the world is built using LAM technology. LAM Research is the first semiconductor front end processing equipment company to set up its manufacturing facility in Penang, Malaysia.

BRUKER



Listed on NASDAQ, this US company is a global developer, manufacturer and distributor of high-performance scientific instruments and analytical and diagnostic solutions. Bruker's expansion of its Malaysian operations is central to its strategy to deliver best-cost, state-of-the-art products from Southeast Asia. The company's product portfolio enables scientists and engineers to explore life and materials at the molecular, cellular and nanoscale levels. These analytical scientific instruments are instrumental in customer innovation, productivity and breakthrough discoveries in applied and pharmaceutical applications, microscopy and nanoanalysis, and industrial applications.

CHENG HUA ENGINEERING WORKS SDN BHD



Specialises in providing total integrated engineering solutions for material handling and conveyor systems. Backed by a respectable legacy spanning over four decades in automated material handling system design, manufacture, installation and software solutions, Cheng Hua's capacity for reliability and cost-effectiveness has allowed it to maintain a strong market position as a "system integrator" and partner of choice with key customers in automotive, tyre manufacturing and logistics industries.

UWC GROUP



Evolving from a trading company in Penang to a large local company (LLC) with six manufacturing plants all over the world, UWC shifted from its initial focus on the vertical transport industry (i.e. elevators) and industrial fabrication to producing parts, components and full turnkey assembly for high-applications in semiconductor, telecommunications, life sciences, medical and heavy-duty machinery. The company is also focusing on contract manufacturing and will equip themselves with state-of-the-art machines and equipment to cater for the demand of MNCs from all over the world.

OERLIKON BALZERS COATING MALAYSIA SDN. BHD.



This Liechtenstein-based company is the world's leading supplier of surface technologies. Through its coating centre in Johor, Malaysia, one of the 109 coating centres around the world, the company currently serves various customers in the ASEAN region, from automotive and aerospace to medical and engineering industries in Malaysia and Singapore. Oerlikon Balzers uses Physical Vapour Deposition (PVD), Plasma-Assisted Chemical Vapour Deposition (PACVD), heat treatment and nitriding processes in a vacuum condition to enable the deposition of thin films with defined compositions and specific characteristics.

Through its PVD- and PACVD-based coating solutions, Oerlikon Balzers is able to provide low-friction, wear-resistant, and chemically inert thin film coatings of between 0.5 μm and 14 μm . The full strength of Oerlikon Balzers' high-end surface treatments is especially apparent for stringent client requirement i.e. when process-acceleration is required, difficult materials must be cut, or when high-grade optics are important.

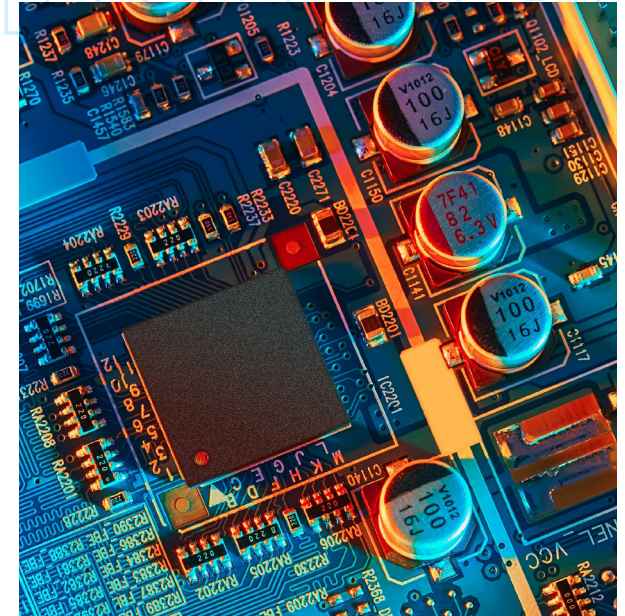
SUCCESS STORIES

PENTAMASTER CORPORATION BERHAD

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This company is another Penang success story that is now a world-class automation and technology solutions provider, serving MNCs from various parts of the globe, including the United States of America, Europe, Africa, Asia Pacific and ASEAN countries. All of its products, including semiconductor test handlers, hospital equipment and material handling systems, are equipped with smart manufacturing technology, such as smart sensors and big data analytics.

Backed by over 25 years of experience in providing integrated and customised solutions for semiconductor, automotive, E&E, pharmaceutical, medical devices, food and beverage and general manufacturing companies, Pentamaster's core competencies include mechanical engineering design, software programming technologies, control engineering, imaging vision and instrumentation design. Pentamaster also provides Smart Solutions such as shop floor management, warehousing management, computerised management and smart control management systems.



GREATECH INTEGRATION

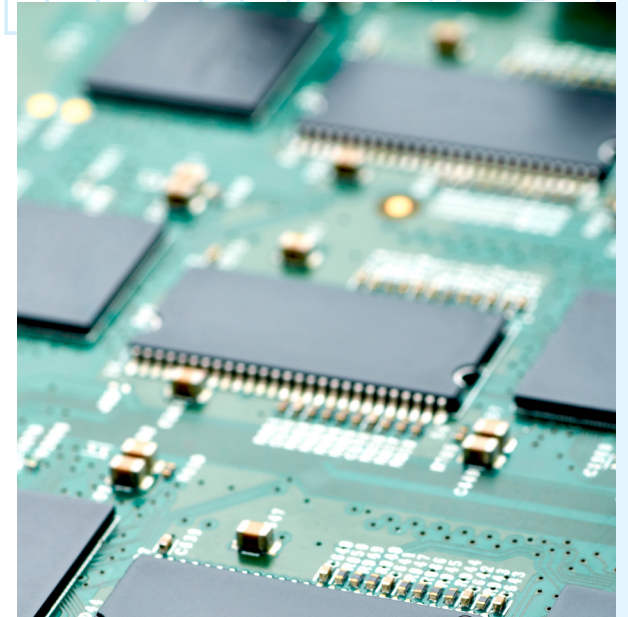


This Malaysian company is one of the world's leading providers of factory automation solutions for various industries, particularly solar, smart devices, semiconductor, energy storage, life sciences, consumer goods and automotive industries. The company boasts a fully capable in-house manufacturing facility complete with a precision machine shop, sheet metal fabrication, assembly, commissioning and world-class service support. They are positioned to serve Fortune 500 companies with innovative and cost-effective solutions and support services.

SUNFLUID ENGINEERING SDN. BHD.



Since its inception in 1988, this company has stood as a pioneer in Malaysia's sheet-metal working machinery sector. It has been steadfast in producing reliable and high-quality hydraulic shears, hydraulic press brakes, bending machines and other custom-built machinery. Sunfluid's range of products also includes factory automation development and trading of machine tools.



SUCCESS STORIES

VITROX TECHNOLOGIES SDN. BHD.

Operating out of Penang, ViTrox specialises in high-speed vision inspection systems for the semiconductor industry. The company provides innovative 3D digital vision inspection solutions to a broad range of semiconductor integrated circuit (IC) packages for major semiconductor manufacturers in Malaysia, Thailand, the Philippines, China, Taiwan, Japan, Korea, India, Europe and the United States of America. ViTrox provides a complete range of inspection systems and a highly customisable one-stop platform that offers data-driven decisions in manufacturing by allowing stakeholders to be remote and to visualise, monitor, control and implement condition-based alerts to reduce downtime and increase throughput.

ViTrox provides a complete range of inspection systems namely Machine Vision

System (MVS) which provides reliable, high speed and cost effective inspection solutions to detect semiconductor and optoelectronic components' dimensional and visual defects, Automated Board Inspection (ABI) which can provide superior Advanced X-ray Inspection (AXI) and Advanced Optical Inspection (AOI) solutions for SMT and PCBA lines and the V2000 AOI for flex and PCB bare boards and Electronic Communication System (ECS) for high speed, reliable and cost effective I/O and motion embedded solutions for the automation industries. ViTrox has invested in a Center of Excellence (CoE) for machine vision which will create innovative communities and develop integrated supply chains via the sharing and collaborative concept among automation system integrators, MNCs and Institutes of Higher Learning.



AMERIX METAL MACHINING TECHNOLOGY SDN. BHD.



This wholly owned Malaysian company transitioned from the fabrication of tooling parts to a technology-driven operation by adopting sophisticated, high-precision manufacturing concepts in Computer Integrated Manufacturing (CIM) and process tracking models in a customised Enhanced Resource Planning (ERP) system. Amerix transformed from producing moulds, tools, dies, jigs and fixtures, to making automatic electro-mechanical servo reel-to-reel moulding systems for the back-end semiconductor industry. The machines serve to carry-out the encapsulation of integrated circuits (ICs), the process of which involves coating ICs with an epoxy moulding compound (EMC), a type of plastic widely used in the semiconductor industry.

ENG TEKNOLOGI SDN. BHD.



Founded in Penang, this regional manufacturing powerhouse specialising in precision casting and machining has commenced the switch from its labour-intensive operations to smart manufacturing processes. This modernisation effort is to reduce its unskilled foreign staff, increase its local technical and highly skilled workers, and enable the production of new high-end products for use in autonomous (“self-driving”) vehicles, semiconductor and optics. The project will focus on production automation via digital shop floor management and automation, smart quality assurance and smart warehousing. Existing local manpower will also be upskilled to facilitate for the adoption of Industry 4.0 technologies such as machine-to-machine (M2M) communication, predictive maintenance, supply chain management and data management.

PENANG AUTOMATION CLUSTER (PAC)



This joint venture (JV) consisting of three local companies have undertaken a small and medium enterprises (SMEs) cluster project to produce factory automation machines, related modules and components. The cluster will build and manage the local supply chain ecosystem, supporting large local companies (LLCs) and MNCs with regard to advanced, innovative and cost-effective engineering of sheet metal fabrication, tooling, machining, and metal finishing services. The cluster will use Industry 4.0 technology to enable clients to track and monitor their orders in real time, as well as in its production process to increase efficiency and traceability. The JV company will provide training and assistance to the SME cluster to develop and elevate local SME capabilities.

CONDUCTIVE INVESTMENT CLIMATE

Malaysia's sound infrastructure, attractive incentives, skilled workforce, laws and pro-business policies form a conducive environment for investment and have earned plaudits from industry players, both local and international.

“Malaysia offers investors a dynamic and vibrant business environment with the ideal prerequisites for growth and profits. Malaysia's key strengths include a well-developed infrastructure and a productive workforce. A politically stable country with a well-developed legal system, Malaysia also provides attractive incentives for investors through its collaboration with ministries, agencies and stakeholders.”

- Oerlikon Balzers Coating Malaysia Sdn. Bhd.

“Relative to its global and regional peers, Malaysia is highly rated for its open market-oriented economy. With supportive government policies such as, its liberal investment policies and tax incentives, coupled with a sound and stable financial system, Malaysia's conducive environment has enabled companies like us to grow by leaps and bounds. A special thanks to MIDA for its support, and we are heartened to witness our success in delivering high technology and quality solutions through our sustained R&D effort.”

- Pentamaster Corporation Berhad

“The Penang Automation Cluster (PAC) is the first-of-its-kind, state-of-the-art integrated high precision parts and fabrication cluster set up by three LLCs in Penang, namely ViTrox, Pentamaster and Walta Engineering. It is showcasing a one-stop local supply chain ecosystem supporting LLCs and MNCs on advanced, innovative and cost-effective precision parts and fabrication. PAC is equipped with Smart Manufacturing V-One system for real-time monitoring and triggering control of machines utilisation, machines capacity and advance data analysis. PAC has continuously enjoyed pro-business government policies, the well-developed infrastructure and vibrant business environment in Malaysia.”

- Penang Automation Cluster (PAC)

“Malaysia’s market-oriented economy, supportive government policies and a large local business community that is ready to do business with international corporations have made Malaysia an attractive export-based manufacturing hub in the region.”

- Cheng Hua Engineering Works Sdn. Bhd.

“Malaysia’s industry-friendly incentives and stable economic policies allow companies tapping into the global market to remain competitive with countries like Korea, Taiwan, Japan and the EU.”

- Sunfluid Engineering Sdn. Bhd.

“Malaysia is ideal for equipment design and development. It also has strong supporting industries to facilitate equipment manufacturing.”

- ViTrox Technologies Sdn. Bhd.

“With more than 40 years of industrial experience and trained by global industry leaders, Malaysia has one of the strongest supply chains in the region, making Malaysia the preferred investment destination.”

- UWC Group

“Malaysia’s industry-support incentives, economically driven policies as well as a well-educated and reliable workforce have enabled Mühlbauer to remain competitive in an increasingly price-driven global market.”

- Mühlbauer Technologies Sdn. Bhd.

“Malaysia is an attractive destination for investors as the Malaysian government is business friendly, supported by ministries, agencies and stakeholders. Its strategic geographical location in the middle of ASEAN further strengthens Malaysia’s position in attracting international corporations, with access to worldwide airports and ports across the country. Furthermore, Malaysia more than 40 years of industry experience has cultivated effective and efficient supply chains with well-developed local suppliers, vendors and supporting industries. The Malaysian government also plays a significant role in enhancing and developing skills-based education and training to develop workforce capability across the industry for a better quality talent pool.”

- Greotech Integration

ENGINEERING SUPPORTING INDUSTRY (ESI)

Malaysia's M&E industry is heavily supported by the engineering supporting industry (ESI). In fact, ESI has become a driving force for not just the M&E industry but also for every other industry. Malaysia's ESI has earned international recognition for its world-class manufacturing standards, with the industry possessing the expertise and experience to supply products and services that are globally competitive in quality, value and delivery time.

There are over 1,000 engineering support and services companies in Malaysia, which include integrated or total solution providers. These companies have advanced themselves to supply low volume and high mix products as well as types of parts and modules to cater for the outsourcing and procurement needs of high-technology industries.

ONE-STOP-CENTRE

With non-equity mode of investment currently on the rise, Malaysia's ESI has positioned itself as a "One-Stop-Centre" that offers total solutions to customers, made possible by upgrading facilities and acquiring technologies to meet the stringent requirements of Original Equipment Manufacturers (OEMs) for parts and components and precision engineering services. These centres offer integrated services ranging from product conception, including design and prototyping, to serial production and managing the entire process flow, including procurement, logistics, packaging, testing and certification.

ESI SUB-SECTORS

Malaysia's ESI encompasses eight activities that provide vital support to the manufacturing and services sectors inclusive of mould, tools and dies, machining, metal casting, metal stamping, surface engineering, heat treatment, forging, and metal fabrication.

MOULD, TOOLS AND DIES

- Recognised as a leading sub-sector of ESI.
- In Malaysia, this sub-sector has the capability of manufacturing most types of moulds, dies and tools to complement the needs of the manufacturing sector.
- There are more than 350 companies in operation, including Sum Hing Engineering Works, Miyazu (M), Ingress Katayama, HL Engineering, HH Precision Mould, Fuji Dies Kogyo, Zeno Tech and HPMT industries.
- Opportunities and large market potential exist for large mould and dies that are more than 10 MT and for high-precision moulds and dies for the E&E industry.

METAL CASTING

- Over the last 50 years, Malaysia's foundry industry has attained a significant level of technological expertise in serving the traditional industries of tin, rubber, and palm oil.
- More than 70 companies are currently in operation, making castings for engineering spare parts, quality machinery spare parts, pumps

MACHINING

- The local machining industry is able to meet most of the country's machining needs and provide total machining solutions to the manufacturing sector. More than 250 companies are undertaking specialised precision services and general supporting machining services.
- Companies have high levels of technological capabilities and utilise state-of-the-art computer numerical control (CNC) machine tools for most of their operations. They are able to undertake high-precision multi-axes, large format and free-form machining activities.
- A number of companies have diversified into the design and manufacturing of modules, particularly for the semiconductor and E&E industries. They have also moved up the value chain from making standard parts (high volume, low mix) to more complex and precise parts (low volume, high mix) using exotic materials, especially for the oil and gas, aerospace, and medical industries.
- Opportunities and large market potential exist for specialised machining services for selected industries, i.e. the oil and gas, aerospace and medical sectors.

and pump parts, palm oil mill machinery parts, automotive components, elevator parts and other machinery parts.

- Opportunities and large market potential exist for larger custom-made sand casting and component casting for selected industries, i.e. oil and gas, aerospace and medical industries.

METAL STAMPING

- The metal stamping industry in Malaysia is an established industry supplying stamped parts to a wide range of industries such as E&E, automotive, machinery and equipment, precision measuring and testing equipment.
- Companies in this sub-sector have acquired the capacity and technical capabilities to serve the various market needs of MNCs such as Panasonic, Sony, Hitachi, Toshiba, Dell, Yamaha, Thomson, Philips and Hewlett Packard.



ESI SUB-SECTORS

SURFACE ENGINEERING

- ▶ This sub-sector has the capability and capacity to cater for most of the industry requirements, which include a variety of plating operations such as batch and continuous precision electroplating, electroless plating, cathodic electrodeposit, physical vapor deposition (PVD), chemical vapor deposition (CVD) and plasma-assisted chemical vapor deposition (PACVD).
- ▶ Companies in this sub-sector are currently servicing the needs of notable multinationals in the E&E and automotive industries. Opportunities and large market potential exist for services for the oil and gas, aerospace, medical, LED and solar/ photovoltaic industries.

HEAT TREATMENT

- ▶ This sub-sector offers continuous mesh-belt heat treatment, vacuum hardening, carburising, carbonitriding, nitriding, nitro-carburising, annealing, normalising and tempering for a diverse range of metal products.
- ▶ Heat treatment services for high-carbon steel and alloy steel materials such as moulds and dies, critical parts for bearings and automotive components, are the latest additions to the list of products already serviced, which include bolts, nuts, shafts, gears, pins and springs.

FORGING

- ▶ This sub-sector comprises companies that produce small and medium forged parts for the automotive and general manufacturing sectors. Most of the companies have the capabilities to produce components of up to 200mm in size and 50kg in weight with press machine capability ranging from 16MT to 600MT.
- ▶ The setting up of many global oil and gas M&E manufacturers in Malaysia creates opportunities and a large market potential. All requirements for large forgings are currently imported primarily from, Korea, Italy, Germany, India, and other Eastern European countries.

- ▶ Prospects for growth are available through expansion activities in the mould and dies sub-sector, M&E manufacturing industries, and production of downstream products of iron and steel, secondary products, automotive parts and component manufacturing. Investments in new ventures with state-of-the-art facilities that are also environmentally friendly are encouraged, especially those incorporating the latest vacuum carburising and vacuum hardening technology.

METAL FABRICATION

- ▶ Malaysian companies in this sub-sector have developed world-class capabilities that can be classified into four categories:
 - Fabrication for the offshore/onshore oil and gas industry – Work includes fabrication for offshore oil drilling platforms such as jackets, production modules, decks, accommodation modules, line pipes and spools, and related industrial onshore activities such as petroleum refineries, petrochemical plants, and storage facilities.
 - Fabrication for building and civil construction – Companies fabricate steel superstructures for high-rise buildings, bridges, flyovers, transmission towers and other infrastructural facilities such as ports and airports.
 - Fabrication for processing and manufacturing plants – Companies undertake turnkey projects to build, install and commission processing plants in the country.
 - Fabrication for industrial machinery and equipment structures and components – Many companies have the capability to supply the needs of the local machinery and equipment manufacturing industry.
- ▶ This sub-sector is considered to be fairly established. In the building and construction industry, many local fabrication companies have begun to source for jobs outside Malaysia. As a result, several local fabricators have gained international recognition.

INCENTIVES

To enhance growth and encourage investments in the engineering supporting sector, the Government offers:

TAX INCENTIVES



- Pioneer Status with a tax exemption of 70% on statutory income for a period of five years, or
- Investment Tax Allowance of 60% on qualifying capital expenditure incurred within a period of five years. This allowance can be offset against 70% of the statutory income for each year of assessment.

REINVESTMENT ALLOWANCE

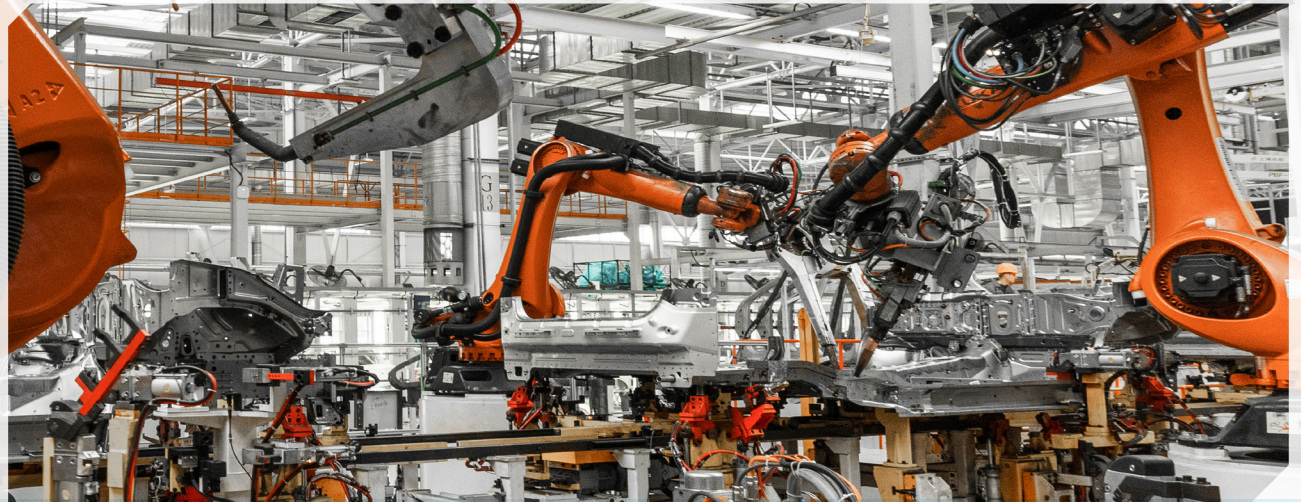


- 60% on qualifying capital expenditure for 15 years

IMPORT DUTY EXEMPTION



- For machinery and equipment, raw materials and components



SMART MANUFACTURING: THE WAY FORWARD

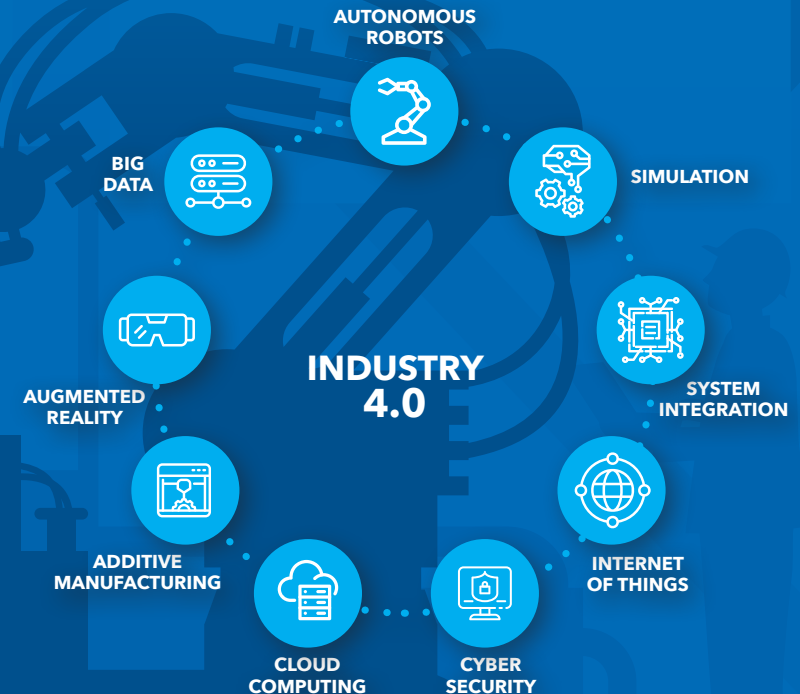
Malaysia embraced Industry 4.0 – the digitisation of manufacturing – with its Industry4WRD policy, with the aim of making the country a strategic partner for global manufacturers and a primary hub for high-tech sectors. Malaysia's M&E sector is a key beneficiary of this policy, with local manufacturers increasingly revolutionising their production processes and benefitting from cutting-edge Industry 4.0 technologies such as the Industrial Internet of Things (IIoT), robotic process automation, artificial intelligence, cloud and edge computing, and big data analytics.

The adoption of additive manufacturing technology in creating parts or prototypes consumes less time, reduces cost and provides more flexibility in creating higher precision products. 4D simulation of machines, production processes or product life cycle through real-time data give engineers more space for testing and development prior to commercialisation. This ensures seamless operations and full design optimisation.

Crucial data obtained from machines spurs new data-driven business such as

providing feedback or alerts for predictive maintenance, results of diagnostic checking, recovery action, remote monitoring and traceability function through accessible dashboards or platforms.

Industry 4.0 solutions help M&E companies improve their operations via smart processes and new business model innovations as well as gain insight into customising designs of the next generation M&E. The rollout of 5G telecommunications in the country by 2023 is also expected to provide fresh momentum to the M&E industry.



Source: Aethon.com

INDUSTRY4WRD

THE VISION

Malaysia's **vision** for manufacturing sector in the next 10 years

Strategic Partner for Smart Manufacturing and related services in Asian Pacific

Primary destination for high-tech industry

Total solutions provider for advanced technology

THE NATIONAL GOALS

Specific **goals** to guide and measure the progress of transformation

Labour Productivity Growth

Manufacturing contribution to economy

Innovation capacity

High-skilled jobs

THE SHIFT FACTORS

A set **shift factors** that need to be optimised in a balanced manner



THE ENABLERS

Specific **enablers** that determine the strategies, policies and action plans



Source: miti.gov.my

MALAYSIA – YOUR LOCATION FOR M&E INVESTMENTS



Highly skilled manpower for research and development, and engineering design activities.



A mature engineering supporting industry for the outsourcing of modules, parts and components, and engineering services.



Attractive and competitive incentives for the manufacture and assembly of high technology and specialised M&E.



A strategic gateway to the ASEAN market, with a population of 664.9 million people in 2021 and projected total GDP of US\$6.7 trillion by 2030.



Well-developed infrastructure which includes excellent land, sea and air connectivity, and integrated telecommunication systems.



Established M&E ecosystems, specifically for high-technology industries such as the semiconductor, palm oil, oil and gas, factory automation and material handling industries.

STRATEGIC PARTNERSHIPS

Malaysia has much to offer companies searching for a strategic and cost-effective engineering supporting outsourcing destination. With its ideal location in the heart of Southeast Asia, a mature and stable economy backed by an integrated infrastructure, it is of little surprise that foreign interest has grown.

The key to considering Malaysia as the region's engineering supporting outsourcing hub of choice is the concept of value and quality. Foreign firms have chosen to remain in Malaysia and many more are looking for joint ventures or seeking to bring business to the country because of the promising rates of return. Malaysia makes for an extremely competitive destination for the regional outsourcing of engineering supporting services and the nation looks forward to welcoming future investors.



Malaysia has signed and implemented 13 free trade agreements (FTAs) which include seven bilateral FTAs with Japan, Pakistan, New Zealand, India, Chile, Australia and Turkey and six regional FTAs through the ASEAN Free Trade Agreement (AFTA) with China, Korea, Japan, Australia-New Zealand, India and Hong Kong.

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