BOM

Embassy of the Kingdom of the Netherlands

Netherlands Enterprise Agency

BCI Global

Sector Study

Opportunities in the Malaysian Advanced Manufacturing Sector for Dutch Advanced Manufacturing

Nijmegen, June 2025

Executive Summary

Executive summary

This sector study, commissioned by the Embassy of the Netherlands and the Netherlands Enterprise Agency, examines strategic opportunities for Dutch advanced manufacturing and systems engineering firms within Malaysia's rapidly expanding semiconductor and advanced manufacturing ecosystem.

It is aimed at identifying actionable pathways for investment, collaboration, and technological contribution. Malaysia has established itself as a key player in the global advanced manufacturing and semiconductor value chains. The country combines robust infrastructure, a skilled technical workforce, and a pro-innovation policy environment to support high-tech industries, particularly in Penang and the broader Northern Corridor.

With strong connections to regional and global markets, Malaysia offers Dutch firms a cost-competitive, scalable, and innovation-oriented platform for Southeast Asian operations. The findings of this study reveal a range of opportunities where Dutch competencies – especially in mechatronics, precision mechanics, optomechatronics, factory automation, and software development – align directly with Malaysia's sectoral needs and policy objectives.

Malaysia’s Advanced Manufacturing Sector

Strategic overview

- Malaysia has established itself as a regional hub for advanced manufacturing, with a complete semiconductor value chain that spans R&D, design, fabrication, assembly, and testing – making it one of only two countries in Southeast Asia with this capability and offering Dutch companies a unique opportunity to plug into a fully integrated ecosystem.

- The country’s industrial base is supported by strategic manufacturing clusters in Penang, Selangor, and Johor, each specializing in key segments such as semiconductors, electronics, and engineering services, and connected through modern logistics infrastructure that ranks 7th globally, ensuring efficient access to ASEAN’s 600+ million consumers.

- Malaysia’s highly globalized economy (with a trade-to-GDP ratio of 127.9%) and participation in ASEAN, RCEP, and CPTPP grants companies' preferential access to some of the world’s largest and fastest-growing markets, positioning it as a cost-competitive alternative to Singapore and a strategic complement to Vietnam in regional supply chains.

- The country benefits from a strong pipeline of technical talent and a supportive regulatory environment, with 44% of tertiary students in STEM fields, rising government investments in engineering education, and pro-business policies such as 100% foreign ownership, generous tax incentives, and robust intellectual property protection.

- Malaysia’s advanced manufacturing growth is driven by three key sectors – E&E, M&E, and ESI, each contributing significantly to GDP and employment, with the E&E sector alone accounting for over €123 billion in exports and employing nearly half a million people in high-tech manufacturing roles.

Malaysia's Advanced Manufacturing Sector

Dutch opportunities

- Malaysia presents a high-impact entry point for Dutch companies in precision engineering, automation, and sustainable manufacturing, with strong alignment between Dutch industrial capabilities and Malaysia's ambitions under its National Semiconductor Strategy and New Industrial Master Plan (NIMP 2030), particularly in chip design, photonics packaging, and smart manufacturing.

- The country's limited presence in R&D, IC design, and advanced system integration creates tangible gaps for Dutch firms to address, whether through joint development of digital twins, AI/ML-enabled testing systems, or deployment of high-precision robotics and ESG-compliant technologies in Malaysian manufacturing lines.

- Dutch companies have multiple viable pathways to market, including greenfield investments in emerging semiconductor hubs like Batu Kawan and Selangor, partnerships with government-linked R&D institutions such as MIMOS and CREST, or integration into the global supply chains of multinationals like Intel, Infineon, and NXP that already operate in Malaysia.

- Supportive government initiatives provide fiscal, regulatory, and infrastructural incentives, including R&D tax allowances, EDA tool access, and fast-track facilitation through MIDA and state-level agencies like InvestPenang, making it easier for Dutch companies to scale operations and manage cross-border technology deployment.

- Given the scarcity of industrial space and skilled labor in Europe, along with shifting global supply chain dynamics, Malaysia offers Dutch firms a compelling "region-for-region" alternative – combining cost efficiency, market access, and talent availability with the strategic benefits of diversification and supply chain resilience.

Contents

1 Introduction

The advanced manufacturing sector in the Netherlands emphasizes high-tech innovation, precision engineering, and sustainable production, driven by strong R&D and collaboration between academia and industry

The advanced manufacturing sector in Malaysia focuses on integrating cutting-edge technologies such as automation, robotics, and IoT to enhance productivity and competitiveness in key industries like electronics, automotive, and aerospace

- This sector study, initiated by the Embassy of the Kingdom of the Netherlands in Malaysia and the Netherlands Enterprise Agency (RVO), aims to explore opportunities for Dutch companies in Malaysia's advanced manufacturing sector

2 Malaysia from a Regional Perspective

Prime location & global access

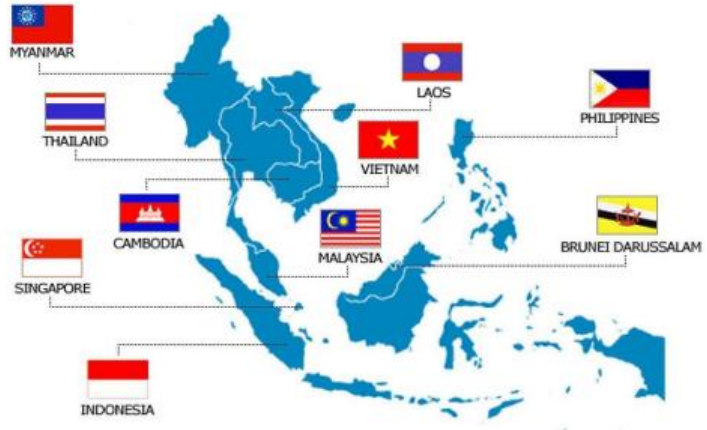
- Trade-to-GDP ratio: 127.9%, highly integrated globally

Robust talent & industrial ecosystem

- Engineering support ecosystem includes 800+ metal fabrication companies

Modern infrastructure & connectivity

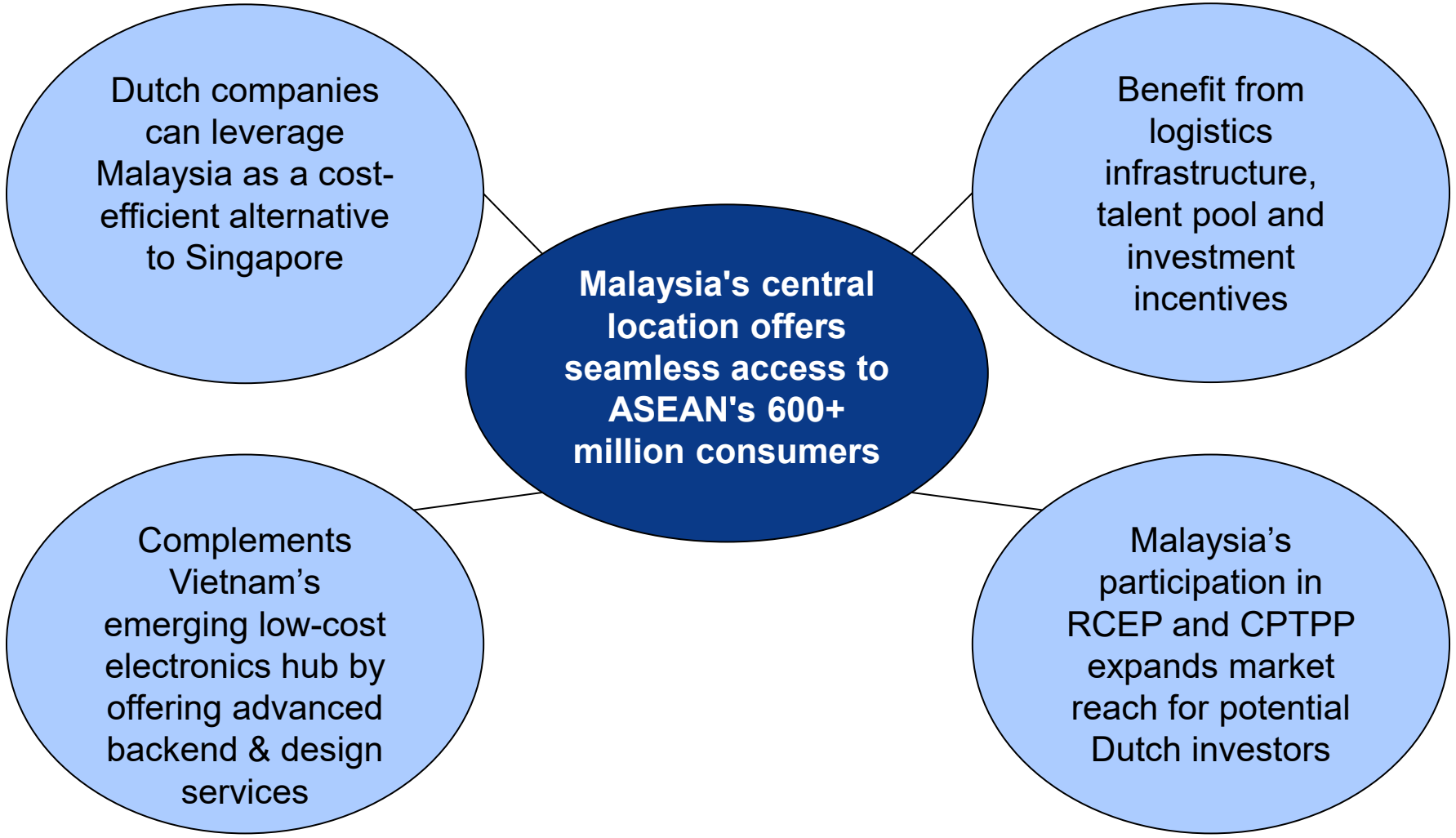
- Advanced logistics network with strong trade connectivity (7th globally; 2nd in SEA)



Pro-business government policies

- 100% foreign ownership, generous tax incentives, strong IP protection, and streamlined processes for expatriates

Leveraging Malaysia in the larger SEA ecosystem



arm

On March 5, Malaysia announced a US$250 million, 10-year deal with UK-based Arm Holdings to acquire semiconductor licenses and technology, aiming to boost its chip industry

Infineon

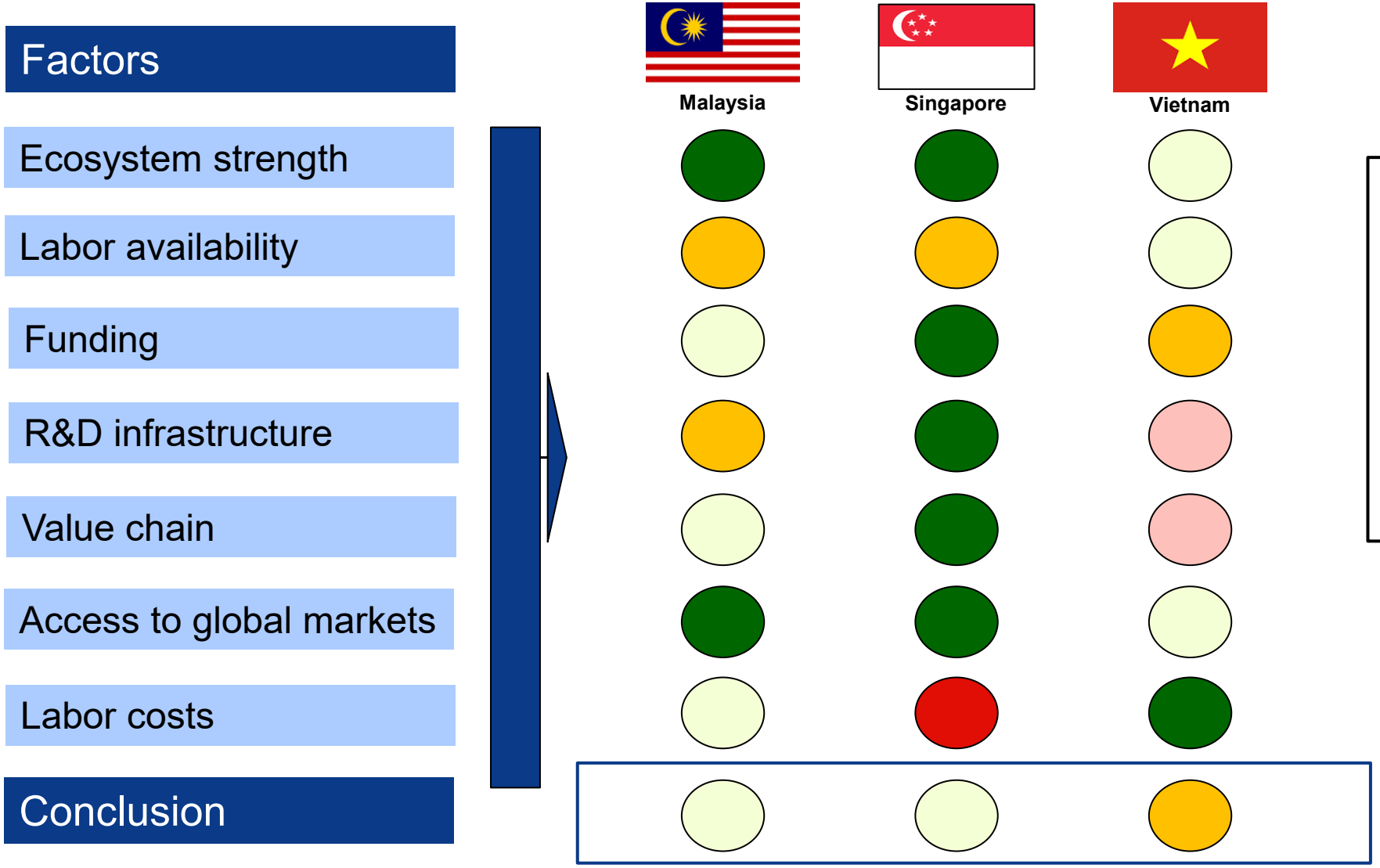
Infineon planning to invest US$5.4 billion over the next five years

Malaysia from a Regional Perspective

Value Chain	Malaysia	Singapore	Vietnam	Philippines	Thailand	Indonesia
R&D/ IC Design						
Equipment/ Material						
Front-end manufacturing						
Back-end manufacturing						

Only Malaysia and Singapore have the complete Semiconductor value chain, while the back-end manufacturing is strong in many Southeast Asian countries

Comparison on key location criteria



- Malaysia is competitively positioned with key strengths in ecosystem strength and access to global markets
- It demonstrates moderate performance in labor availability, R&D infrastructure, and value chain, while remaining neutral in funding and labor costs

Key strength
Strength
Neutral
Weakness
Sign. weakness

3 Malaysian Advanced Manufacturing Ecosystem

Introduction

- Malaysia has positioned itself as a key player in the global semiconductor and advanced manufacturing sectors
- This creates strategic entry points for Dutch firms looking to expand into Southeast Asia

Malaysia has the complete semiconductor value chain from R&D, EMS (Electronic Manufacturing Services) to Assembly and Testing. **However, its expertise is mostly on Assembly, Testing and EMS. Malaysia is still upcoming in the high-end wafer manufacturing**

Geographical landscape

Semiconductor industry

The majority of Malaysia's electronics manufacturing facilities are concentrated in the western region of the country

Penang serves as the primary hub for electronics manufacturing, followed closely by the states of Selangor and Johor

- 80% of Malaysia's global backend semiconductor output
- 5% of worldwide semiconductor sales
- Since the 1970s, Penang has drawn semiconductor-related investments mostly from Japan and China

Talent base in Malaysia

- Malaysia has one of the highest proportions of STEM graduates globally, with 44% of tertiary students completing studies in science, technology, engineering, and mathematics (STEM) fields
- Despite this strong supply, demand for STEM professionals continues to rise across key sectors
- To address future workforce needs, the government has set a target to increase the proportion of STEM students to 60%
- This initiative aims to bolster Malaysia's capacity in science, engineering, and technology, supporting national industrial and economic development goals

A significant number of international educational institutions support the country's STEM base

Sources: MIDA, 2024

Research institutes and academia

These institutions serve as springboards for innovation, prototyping, and commercialization within Malaysia's advanced manufacturing sector

CEDEC
Provides design services and embedded solutions, enabling Dutch semiconductor design houses to collaborate on prototyping and testing

MIMOS
Key R&D partner in sensors, microelectronics, and smart systems; ideal for joint research

IMEN
Offers nanofabrication and MEMS capabilities; potential for academic-industry collaboration

CREST
Facilitates Dutch-Malaysian partnerships in high-impact research and talent development

Certification and authorization bodies

Certification bodies

SIRIM QAS
Supports compliance with international quality standards, essential for export-focused Dutch firms

TUV SUD & SGS
Ensure certification for safety, sustainability, and environmental performance

These bodies streamline the process for Dutch products/services to integrate into Malaysian and global supply chains

Authorization bodies for IP and EDA tools

MyIPO
- Strong IP regime critical for Dutch firms in high-IP sectors such as chip design and software

MIDA
- Facilitates R&D tax incentives and assists with EDA tool licensing – vital for Dutch design & simulation tool vendors

MITI
- Shapes investment policies favorable to foreign tech firms, enabling smoother tech transfer

See Annex 1 for further detailing of MIDAs role as a facilitator and promoter of investment

Policies and initiatives

Strengthening Malaysia's Semiconductor Ecosystem (1/2)

Malaysia launched the National Semiconductor Strategy (NSS) in 2024 to position itself as a global semiconductor hub, targeting €100 billion in investments over three phases

- Phase 1: Strengthen existing IC packaging and fabrication capabilities
- Phase 2: Advance local design and integration in cutting-edge manufacturing
- Phase 3: Foster globally competitive local semiconductor firms

Key Opportunities for Dutch Firms

Skilled Talent Pipeline:

- 60,000 engineers to be trained
- Penang STEM Talent Blueprint supports long-term workforce development

Strategic Locations:

- Penang and Selangor as regional semiconductor hubs
- Klang Valley Semiconductor Corridor to host ~40 IC firms

Government Incentives:

- €5.3 billion in fiscal support
- Incentives for IC design, advanced packaging, and equipment manufacturing

Strategic Fit for Dutch Industry

- Access to growing talent and supply chains
- Strong policy backing and regional integration
- Opportunity to co-develop technologies and manufacturing systems in high-value segments

Policies and initiatives

Strengthening Malaysia’s Semiconductor Ecosystem (2/2)

National E&E Roadmap (E&E 2.0)

- Launched as part of the Economic Transformation Program, the roadmap seeks to transition Malaysia's E&E industry from labor-intensive operations to high-value, knowledge-based activities
- **Strategic Focus Areas:** Development of photovoltaic (PV) systems and modules, expansion of the embedded systems industry, manufacturing of electric vehicle components, support for regional rail maintenance, and the advancement in nanotechnology applications
- **Goals:** Enhance Malaysia's position in the global semiconductor value chain, encourage innovation and technological adoption among local enterprises, and to attract foreign and domestic investments in high-tech sectors

Electrical & Electronics (E&E) Productivity Nexus

- Established in 2017 under the Malaysia Productivity Blueprint, the E&E Productivity Nexus (EEPN) aims to enhance productivity in the E&E sector through public-private partnerships
- **Key objectives:** Foster collaboration between industry players and government agencies, address challenges such as limited R&D investment, digital infrastructure gaps, and talent shortages, and promote the adoption of advanced technologies and best practices.
- **Recent initiatives:** The National E&E Forum 2024, organized by the Malaysia Semiconductor Industry Association (MSIA) and supported by EEPN, featured discussions on IC design, AI innovation, and advanced packaging

4 Malaysian Advanced Manufacturing Sectors

Malaysia is a regional hub for advanced manufacturing, driven by three core industries

Electrical & Electronics (E&E)

- Largest manufacturing contributor to Malaysia's exports and GDP
- Focus areas: semiconductors, integrated circuits, sensors, and consumer electronics
- Strong ecosystem with multinational corporations and R&D facilities

Machinery & Equipment (M&E)

- Supports automation, robotics, and smart manufacturing technologies
- Key supplier for E&E, automotive, aerospace, and oil & gas industries
- Strong emphasis on precision engineering and custom solutions

Engineering Support Industry (ESI)

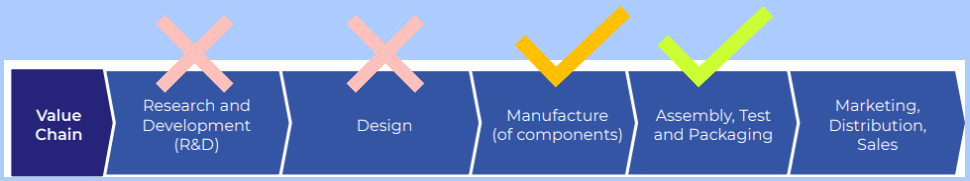
- Provides critical support services: tooling, metal stamping, surface treatment, and fabrication
- Backbone for the M&E and E&E sectors
- Rapidly adopting Industry 4.0 technologies and capabilities

Industry Snapshots

Electrical and Electronics (E&E)

E&E Focus

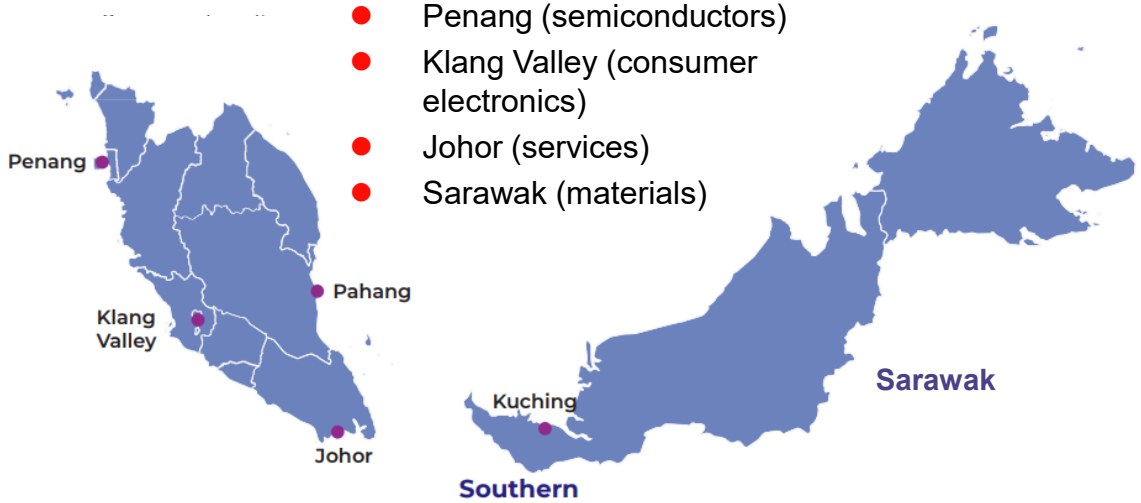
- **4 sub-sectors**: electronic components, consumer/industrial electronics, and electrical products
- **Strong in ATP** (assembly, testing, packaging); weak in R&D and design
- **Value Chain Focus**: R&D, design, component manufacturing, assembly, testing, and packaging



- **Industry Structure**: Dominated by SMEs (89% of companies); majority focused on low-value segments (ATP).

Major clusters:

- Penang (semiconductors)
- Klang Valley (consumer electronics)
- Johor (services)
- Sarawak (materials)



Supporting Ecosystem

- Strong industry associations (FMM, MSIA) and active government agencies (MITI, MIDA, MATRADE)

Policy Landscape

- Guided by RMKe-12, Industry4WRD, and E&E Roadmap

Sources: MITI, 2025

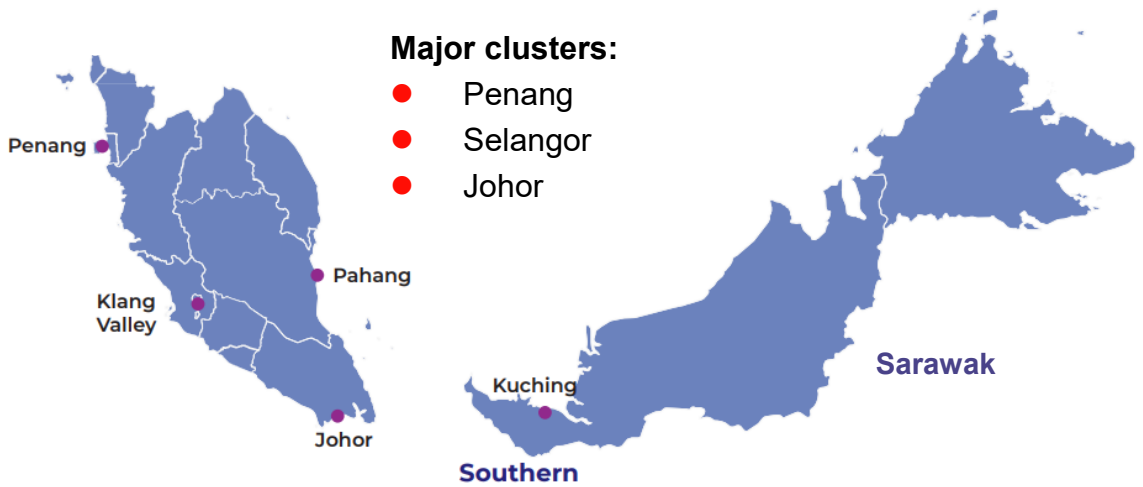
Industry Snapshots

Machinery and Equipment (M&E)

M&E Focus

- **4 sub-sectors:** general, specialized, power generation, and metalworking machinery
- **Supported by 8 sub-sectors** under Engineering Supporting Industries (ESI)
- **Medium or low presence** across most industry verticals
- Covers R&D, sourcing, manufacturing, integration, distribution, and after-sales services

Value Chain	R&D Activities	Raw Materials	Parts & Products Manufacturing	Builder/ System Integration	Sales & Distributions	Services
Services within M&E	Design and development	Sourcing	Manufacturing	Assembly and integration	Marketing	Aftersales services
			Engineering Support Services	Quality assurance	Packaging	MRO
					Inventory	Provision of software
					Warehousing	
					Supply chain and logistics	



Major clusters:

- Penang
- Selangor
- Johor

Industry structure

- Over 2,500 companies; majority are SMEs

Industry associations

- Many industry associations (i.e., MSTMA, MISIF)

Sources: MITI, 2025

Performance snapshot

Growth drivers

E&E Focus

- Contributed 6.8% of GDP (€19.9B in 2020).
- Investments: €36.7B in just 2021–2022 with 55,434 jobs created

Exports

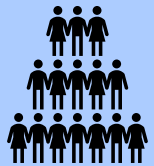
€123B in 2022

- 38.3% of national exports
- Semiconductor products dominate (65.2%).

Imports

€81.6B in 2022

- Driven by semiconductor related products



- 469,035 jobs (2022)
- Labor productivity grew at 7.1% CAGR (2019–2022).

M&E Focus

- GDP contribution grew from ~€1M (2006) to €3.3B (2022); CAGR 7.9%.
- Investments: €2.5B in 2021–2022 with 12,676 jobs created

Exports

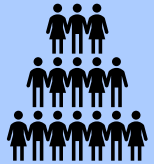
€12.5B in 2022

- Key products include semiconductor machinery and pumps

Imports

€18.5B in 2022

- Mainly advanced tech equipment



- 96,289 (2022)
- Labor productivity grew at 2.6% CAGR (2019–2022).

Sources: MITI, 2025

Trends and opportunities

Future growth pillars

Key opportunities

E&E

- Global semiconductor market to double by 2030
- Shift from ATP to R&D, IC design, wafer fabrication
- **SME role in outsourced manufacturing and advanced packaging**

M&E

- High growth forecast in power (8.7%), general M&E (8.0%), and metalworking (7.3%)
- Expansion in machine tools for high-tech industries
- Potential in predictive maintenance, smart manufacturing, system integration

The E&E industry's high capital requirements create entry barriers for SMEs

- SMEs can overcome these barriers by partnering with outsourced or contract manufacturers
- This approach allows SMEs to focus on core competencies (e.g., product design, marketing)
- Outsourcing helps reduce production costs and provides access to specialized, scalable manufacturing capabilities
- Industry collaboration between SMEs, local service providers, and ODMs should be encouraged
- Such cooperation can enhance SME participation in high value-added activities and boost Malaysian-made product output

Sources: MITI, 2025

Challenges

Structural and strategic barriers

SME Limitations

- E&E: SMEs contribute only ~9% to value-add despite 89% market share
- M&E: SMEs struggle with technology access and R&D capacity

R&D Gaps

- E&E: Disconnect between academia's basic research and industry needs
- M&E: Limited local R&D investment; MTC and innovation centers offer some support

Talent Mismatch

- E&E: High reliance on low-skilled labor; need for upskilling via AI, automation
- M&E: Graduates lack practical, 4IR-aligned skills; open-source platforms proposed for training

Common needs include stronger university-industry collaboration; more inclusive policies to integrate SMEs into GVCs and emphasis on automation and digital readiness

Sources: MITI, 2025

SWOT analysis – Malaysian Advanced Manufacturing

BCI Global

Strengths

- Complete semiconductor value chain (front-end to ATP)
- Competitive labor costs with strong STEM graduate pipeline
- Modern infrastructure, connectivity, and trade access
- Pro-business policies (100% foreign ownership, tax incentives, IP regime)
- Strong support ecosystem

Weaknesses

- Limited domestic R&D and IC design capabilities
- Heavy reliance on low/mid-skill labor in manufacturing
- Fragmented SME participation in high-value segments
- Limited funding channels for tech commercialization
- Gaps in industry-academia collaboration and practical training

Opportunities

- Rising demand for automation, AI, and precision engineering
- Dutch expertise fits key gaps: design, mechatronics, simulation tools
- ESG focus opens doors for Dutch green tech and cleanroom innovations
- Partnerships with local players for market access and R&D co-development

Threats

- Regional competition from Vietnam, Thailand, and Indonesia
- Global semiconductor supply chain volatility and decoupling trends
- Talent brain drain and retention challenges in high-tech fields
- Overdependence on foreign firms for front-end semiconductor technology

5 Unlocking Opportunities for Dutch Companies in Malaysia

Malaysia is a resilient and innovation-driven hub in Southeast Asia

- Dutch strengths in mechatronics, automation, AI, and sustainable manufacturing align well with Malaysia's ambitions under NIMP 2030 and the National Semiconductor Strategy
- Major gaps in R&D, system integration, and design offer tangible entry points for Dutch technology leaders
- Strong policy support, talent base, and regional connectivity make Malaysia ideal for Dutch investment, joint ventures, and R&D collaborations

General areas of opportunity

(1) LABOR-DRIVEN

Competitive labor costs in Malaysia

- Average production worker salaries in the EU are over 150% higher compared to those in Malaysia

Skilled labor force in Malaysia

- Malaysia demonstrates a strong talent pipeline with a high proportion of STEM graduates; UNESCO data indicates that 43.5% of tertiary students in Malaysia graduate in STEM fields, the highest globally

(2) RISK-DRIVEN

Political neutrality of Malaysia

- Provides a strategic advantage for companies seeking to diversify supply chains amid rising geopolitical tensions, such as the US-China trade conflict/tariffs
- Geopolitical competition has impacted third-party countries; for instance, Taiwan has halted supply to Huawei in compliance with U.S. restrictions

(3) ECOSYSTEM-DRIVEN

Malaysia offers a robust and integrated ecosystem for advanced manufacturing, particularly in M&E and E&E

- Strong industrial clusters, a deep supplier base, and government support enable end-to-end capabilities
- Only Malaysia (and Singapore) in Southeast Asia have the complete Semiconductor value chain: from R&D to front-end and back-end manufacturing

(4) MARKET-DRIVEN

Malaysia has market access to 3 large free trade groups

- The ASEAN, the 3rd largest market in the world with 622 million people (only behind China and India)
- The RCEP, the world's largest free trade agreement
- The CPTPP will add new markets of Canada, Mexico, Peru, and Chile with combined market of 217 million

Identifying high-potential specialist fields

To ensure a strategic focus, an initial high-level assessment was conducted across a wide array of specialist fields within the semiconductor and advanced manufacturing landscape.

Step 1: High-Level Filtering of Specialist Fields

This step was designed to align global market dynamics with Dutch industrial strengths and narrow the scope to the most promising segments

The filtering process involved three key stages:

1. **Filter 1: Alignment with Dutch Competencies**

Focused on identifying fields that match the core technological and innovation strengths of Dutch companies

2. **Filter 2: Industry Segment Attractiveness**

Assessed the global size and relevance of each industry segment to prioritize areas with substantial market potential

3. **Filter 3: Growth Trajectory**

Evaluated the pace of growth across segments to highlight those experiencing the most dynamic expansion

Step 2: In-Depth Segment Assessment

Segments that passed the high-level filtering were then examined in greater detail to identify concrete business opportunities:

Mapping of Key Players

Relevant local and international companies operating in each promising segment were identified.

Opportunity Analysis

Detailed insights were gathered on these companies to assess specific partnership, investment, or business development prospects for Dutch firms

Identifying high-potential specialist fields

The following specialist fields emerged as the most promising for Dutch companies after a structured filtering based on strategic alignment, market size, and growth potential

#	Specialist Field	Sub-Category
1	Automation Systems	Optical modules
2	Wafer foundry, OSAT, and IDM	Silicon-based devices
3	IC design	IC design
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules
7	Precision Mechanical Systems	High-precision mechanics
8	Surface treatments	Surface treatments
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification
16	Software	Activities – Services
17		Functions – System software
18		Functions – Software for hardware modules

Relevant companies in Malaysia in each of the specialist fields are illustrated on the following slides

More detailed information per company can be found in the annex

Overview of key companies (1/2)

Optical modules

SCHOTT glass made of ideas
Edmund optics | worldwide
amax PRECISION OPTIC
Canon
OHARA

Silicon-based devices

SILTERRA
unisem
ANALOG DEVICES
nexperia
NXP
life.augmented
Globetronics Technology Bhd.
xfab
onsemi

IC design

Elterra
LATTICE SEMICONDUCTOR
SKYECHIP Accelerating Computing
OPPSTAR
INFINECS Innovate Frontier Together
MICROCHIP
xperior
MaiStorage
Synkom
SYMMID
TECH mahindra
KEYASIC
Capgemini engineering
ICmic IC MICROSYSTEMS

Mechatronic modules & precision assemblies

VITrox
TTVISION
KOBAY TECHNOLOGY BHD
neways
SFP
Aemulus
CNERGENZ
QES Assuring you our best, always!
ESTEK AUTOMATION
Mi Equipment
MMSV
CORTEX ROBOTICS

With EFEM capabilities

GREATECH
PENTAMASTER

Automation modules

XTS Technologies
mks
Veeco
SMIF AUTOMATION

*Please refer to **Annex 4 – Companies in Malaysia** for more information on all companies listed here*

Overview of key companies (2/2)

Precision mechanical systems

Surface treatments

Software

In-house software

3rd party software vendors

Machine conditioning

*Please refer to **Annex 4 – Companies in Malaysia** for more information on all companies listed here*

Levels of opportunity for Dutch companies

(A) Industry-specific opportunities

Malaysia has a supply/partner base

- Dutch companies can partner with relevant companies that are already present in the Malaysian ecosystem (contract manufacturing, development, etc.)
- Dutch companies can source from specialized suppliers in Malaysia

Malaysia as a market

- Malaysia offers market potential for Dutch companies: selling materials/components/ services to companies that are located in Malaysia

(B) Malaysia as a potential new location

- Malaysia offers a good investment climate for semiconductor related investments, e.g., into new manufacturing sites

A Industry-specific opportunities

E&E industry

Presence of Industry Players along the Value Chain of E&E Industry

Sub-Sectors	Value Chain	Research and Development (R&D)	Design	Manufacture (of components)	Assembly, Test and Packaging
	Electronic Components	Low Presence	Medium Presence	Low Presence	High Presence
	Consumer Electronics	Low Presence	Low Presence	Low Presence	High Presence
Industrial	Computer Equipment	No Presence	Low Presence	Low Presence	High Presence
Industrial	Communication Equipment	No Presence	No Presence	High Presence	Medium Presence
	Electrical	Low Presence	Medium Presence	High Presence	High Presence

Source: NIP

Key opportunity signals

- **Low or no presence in R&D and Design** across most subsectors
- **High presence in Assembly, Test and Packaging** – existing demand for automation and inspection solutions

Implications

- High potential for Dutch design and software vendors (EDA, AI/ML for testing) to partner with Malaysian fabs
- Advanced equipment providers (e.g., robotics, precision tools, cleanroom tech) can scale manufacturing impact
- High opportunity in chip design, embedded systems, simulation tools
- Dutch firms can partner with CEDEC, MIMOS to fill this design gap

A Industry-specific opportunities

M&E industry

Presence of Industry Players along the Value Chain of M&E Industry

Sub-Sectors	Value Chain	R&D Activities	Raw Materials	Parts & Products Manufacturing	Builder/ System Integration	Sales and Distributions	Services
	General Industrial M&E, Components and Parts	Medium Presence	Low Presence	Medium Presence	No Presence	Medium Presence	Medium Presence
	Specialised M&E for Specific Industries	Medium Presence	Low Presence	Medium Presence	Medium Presence	Medium Presence	Medium Presence
	Power Generating M&E	Medium Presence	Low Presence	Medium Presence	Medium Presence	Medium Presence	Medium Presence
	Machine Tools and Metal-working M&E	Low Presence	Low Presence	Medium Presence	Low Presence	Medium Presence	Medium Presence

Source: MIDA

Key opportunity signals

- **No presence in builder/system integration** for general industrial M&E
- **Low/medium presence in R&D** across all M&E sub-sectors
- Medium presence in (parts & products) manufacturing and services indicate a stable base for upgrading

Implications

- Dutch firms can address integration gaps through factory automation, predictive maintenance and turnkey system architecture
- Opportunity for technology transfer and training programs in advanced mechatronics and smart tools

A Industry-specific opportunities

High-potential fields for Dutch entry (M&E + E&E)

Example opportunities for Dutch companies to enter specific segments in the advanced manufacturing sector

Segment	Rationale	Example Dutch Firms
Mechatronic Systems	Precision & automation in assembly	VDL, Technobis
Optomechatronics	Photonics packaging, AI cameras	Philips, SmartPhotonics
Software & simulation	EDA, digital twins	Sioux, TNO
Machine conditioning	Predictive maintenance	Ultimaker, BrainCreators
Surface treatments	ESG compliance, chip packaging	Ionbond, Maan Group

A Industry-specific opportunities

Engineering support industry (ESI)

Malaysia is strengthening its position in high-tech manufacturing, especially in semiconductors and advanced engineering

ESI sub-sectors show strong baseline capabilities but face clear gaps in ultra-precision, automation, and sustainability

Dutch firms have unique strengths in precision machining, mechatronics, software, and ESG-compliant technologies

Strategic fit aligns with Malaysia's New Industrial Master Plan (NIMP 2030) and National Semiconductor Strategy (NSS)

ESI Sub-sectors	Existing Capabilities	Opportunities
I Mold & dies	• Precision specifications by international semiconductor industry requirements for end-user industry e.g., automotive, E&E, etc.	• High precision mold and dies for E&E industry • Large molds (> 10mt) for automotive, plastic industries)
II Machining	• Free-form machining • Precision level up to 5 micron • Large format machining >5 meter	• Ultra-precision machining • Exotic materials machining • Laser beam machining • Machining for high-tech industries
III Metal casting	• Mass production of high-pressure and low-pressure die casting • End-user industry: automotive, telecommunications, etc.	• Large component casting • Custom-made sand casting
IV Surface engineering	• Electroplating • Electroless electroplating and anodizing • Hard chroming • High precision physical vapor deposition, plasma-enhanced chemical vapor deposition and chemical vapor deposition • High precision powder and spray painting	• Specialized coating for high-end industry • Thermal spray coating • Specialty metal coatings • Ceramic coatings
V Heat treatment	• Carburizing, nitriding, vacuum handling, quenching, annealing, normalizing, and tempering	• Specialty heat treatment • Process for high-tech industries
VI Metal forging	• Small (<10mt) parts • Hot and cold forging	• Large forging for high-tech industries • Open forging
VII Metal stamping	• High precision stamping • Progressive stamping • Mechanical press machines ranging from 30 – 1,300 mt	• Processes for improvement to cater for latest demand/industry technology requirement
VIII Metal fabrication	• Large sheet metals processing	• Specialty fabrication for high-tech industries

Source: MIDA

A Industry-specific opportunities

I Mold & dies

ESI Sub-sectors	Existing Capabilities	Opportunities
A Mold & dies	• Precision specifications by international semiconductor industry requirements for end-user industry e.g., automotive, E&E, etc.	• High precision mold and dies for E&E industry • Large molds (> 10mt) for automotive, plastic industries)

Current capabilities

- 446 companies
- Precision specifications by international semiconductor industry requirements
- End-user industry: Automotive, E&E

Opportunities for Dutch companies

- Supply large precision molds (>10mT) for plastic and automotive sectors
- Partner with Malaysian firms for E&E industry-compliant high-spec molds
- Introduce smart die-monitoring systems with Dutch predictive maintenance tools

Potential Dutch players

- VDL Groep
- Vero Software (Hexagon)
- Boschman

Not exhaustive list

A Industry-specific opportunities

II Machining

ESI Sub-sectors	Existing Capabilities	Opportunities
B Machining	• Free-form machining • Precision level up to 5 micron • Large format machining >5 meter	• Ultra-precision machining • Exotic materials machining • Laser beam machining • Machining for high-tech industries

Current capabilities

- 325 companies
- Precision up to 1p and size up to 2 mtr.
- End-user industry: Semiconductor, E&E, Aerospace, Oil & Gas

Opportunities for Dutch companies

- Offer ultra-precision machining for photonics and medical components
- Transfer technology in exotic materials machining (e.g., ceramics, silicon carbide)
- Provide laser beam machining & CNC upgrades

Potential Dutch players

- Hembrug
- Mikron
- Demcon

Not exhaustive list

A Industry-specific opportunities

III Metal casting

ESI Sub-sectors	Existing Capabilities	Opportunities
C Metal casting	• Mass production of high-pressure and low-pressure die casting • End-user industry: automotive, telecommunications, etc.	• Large component casting • Custom-made sand casting

Current capabilities

- 95 foundries
- Mass production high-pressure and low-pressure die casting
- End-user industry: Automotive, Telecommunication

Opportunities for Dutch companies

- Supply technology for customized sand casting for aerospace/EV parts
- Collaborate on large component casting automation
- Support with casting simulation software for design optimization

Potential Dutch players

- Sioux Technologies
- Vostermans Alu Foundries

Not exhaustive list

A Industry-specific opportunities

IV Surface engineering

ESI Sub-sectors	Existing Capabilities	Opportunities
D Surface engineering	• Electroplating • Electroless electroplating and anodizing • Hard chroming • High precision physical vapor deposition, plasma-enhanced chemical vapor deposition and chemical vapor deposition • High precision powder and spray painting	• Specialized coating for high-end industry • Thermal spray coating • Specialty metal coatings • Ceramic coatings

Current capabilities

- 125 companies
- 85% are foreign owned/JV
- Electroplating, Phosphating, Anodizing
- End-user industry: Semiconductor, E&E, Automotive

Surface engineering is a core competency of Dutch companies, presenting a strategic opportunity to contribute in Malaysia, where local expertise in this area remains limited

Opportunities for Dutch companies

- Provide specialized coatings for medical, aerospace, photonics
- Deploy ceramic and thermal spray coatings for high-temp environments
- Partner for ESG-compliant coating systems

Potential Dutch players
- Ionbond
- Maan Group
- Holst Centre

Not exhaustive list

A Industry-specific opportunities

V Heat treatment

ESI Sub-sectors	Existing Capabilities	Opportunities
E Heat treatment	• Carburizing, nitriding, vacuum handling, quenching, annealing, normalizing, and tempering	• Specialty heat treatment • Process for high-tech industries

Current capabilities

- 17 companies
- Carburizing, nitriding, vacuum handling, quenching, annealing, normalizing, tempering
- End-user industry: Automotive, Shipyard, Cement, Aluminum Extrusion

Opportunities for Dutch companies

- Supply specialty heat treatment systems for advanced alloys
- Integrate smart heat treatment monitoring and control software
- Establish JV for automated heat treatment lines

Potential Dutch players

- Nitrex
- ALD Vacuum Technologies

Not exhaustive list

A Industry-specific opportunities

VI Metal forging

ESI Sub-sectors	Existing Capabilities	Opportunities
F Metal forging	• Small (<10mt) parts • Hot and cold forging	• Large forging for high-tech industries • Open forging

Current capabilities

- 8 companies
- Mostly small parts (less than 10MT)
- Open, drop, press, roll and cold forging
- End-user industry: Automotive, E&E

Opportunities for Dutch companies

- Provide open die forging solutions for aerospace/defense
- Scale up with large forging capacity using Dutch automation expertise
- Develop sensor-integrated forging processes

Potential Dutch players

- Morssinkhof Rymoplast
- Schuler Group

Not exhaustive list

A Industry-specific opportunities

VII Metal stamping

ESI Sub-sectors	Existing Capabilities	Opportunities
G Metal stamping	• High precision stamping • Progressive stamping • Mechanical press machines ranging from 30 – 1,300 mt	• Processes for improvement to cater for latest demand/industry technology requirement

Current capabilities

- 148 companies
- Precision tolerances less than 1u, presses capacity up to 600 tons
- End-user industry: E&E, Automotive

Opportunities for Dutch companies

- Introduce progressive die technologies and servo presses
- Partner for process automation and digital stamping lines
- Localize tooling design services using Dutch software platforms

Potential Dutch players

- AAE
- GNS Technology
- Philips Engineering

Not exhaustive list

A Industry-specific opportunities

VIII Metal fabrication

ESI Sub-sectors	Existing Capabilities	Opportunities
H Metal fabrication	• Large sheet metals processing	• Specialty fabrication for high-tech industries

Current capabilities

- 800 companies
- Simple household items to steel structure for skyscrapers and offshore oil drilling platform

Opportunities for Dutch companies

- Supply specialized sheet fabrication for high-reliability sectors
- Transfer expertise in Industry 4.0-integrated fabrication lines
- Launch green fabrication solutions with low-energy footprint

Potential Dutch players

- TNO
- LVD Group
- Trumpf Netherlands

Not exhaustive list

A Industry-specific opportunities

Engineering support industry (ESI), strategic business models

Model		Implementation example
Contract Manufacturing	→	Outsource photonics machining to Malaysian ESI players
Joint Ventures	→	Co-develop coating systems with MIMOS/IMEN
Supplier Integration	→	Supply precision dies/machining to Intel or STMicro
M&A	→	Acquire forging/stamping SMEs in Penang cluster
Greenfield Investment	→	Establish R&D center in Batu Kawan for tool development

B Malaysia as a potential new location

Malaysia offers a good investment climate for semiconductor related investments, e.g., into new manufacturing sites

- Scarcity of space / capacity / labor in the Netherlands
- Trend towards decentralizing / de-risking end-to-end supply chains
- China +1 strategy
- Region for region supply chain strategies
- Decarbonization; e.g., reducing freight distances inbound and outbound

Classification of opportunities

Type	Opportunity	R&D / Design	Equipment / Material	Front end mfg	Back end mfg	Indication of opportunity scale	Remarks / examples
A. Supply & Partnerships							
A1	Collaborate with Malaysia's industrial base		✓	✓	✓	●	• Partner with ESI suppliers for coatings, stamping, machining • Provide automation to local contract manufacturers
A2	Engage with Malaysian R&D ecosystem	✓	✓			◑	• Joint R&D with CEDEC, MIMOS • Co-develop smart mechatronic systems
B. Market Development							
B1	Sell high-tech products & services	✓	✓	✓	✓	◕	• Predictive maintenance, simulation software, factory automation • Robotics, cleanroom tools, AI testing systems
B2	Use Malaysia as ASEAN/RCEP hub	✓	✓	✓	✓	◑	• Offer smart systems and design services via regional clusters • Serve regional demand for precision and automation
C. Investment & Expansion							
C1	Establish R&D/design presence	✓				◑	• R&D centers for chip design, embedded systems • Localize software & simulation capabilities
C2	Open production or assembly sites		✓	✓	✓	◕	• Precision machining for photonics • Greenfield plants for smart tools, forging, packaging
D. Tech Transfer & Specialization							
D1	Upgrade Malaysian industrial capabilities	✓	✓	✓		◑	• ESG-compliant coatings, smart heat treatment • Advanced machining (ceramics, SiC), automation tooling
D2	Develop niche tech partnerships	✓	✓		✓	◔	• Photonics packaging, optomechatronics • Local AI cameras, digital twins, simulation tools

6 Key Take Aways

Developing value chain in the region	• Malaysia and Singapore are the only SEA nations with a complete semiconductor value chain • Strong capabilities in Assembly, Test & Packaging activities and engineering support industry segments • National initiatives aim to elevate Malaysia's role in R&D, design, and high-value manufacturing
Strategic investment hub	• Central location with preferential access to ASEAN, RCEP, and CPTPP markets • Well-developed industrial ecosystem, infrastructure, and talent pipeline • Competitive operating costs and attractive fiscal and regulatory incentives
Targeted opportunities for Dutch companies	• Demand for Dutch expertise in design, precision engineering, and surface engineering segments (and more) • Strong fit in high-tech sectors including mechatronics, simulation, and advanced tooling • Viable models for market entry include partnerships, contract manufacturing, and R&D ventures

Annex

Annex 1 – MIDAs Role in Investment

Role of MIDA (1/3)

The Malaysian Investment Development Authority (MIDA) plays a crucial role in promoting and facilitating investments in Malaysia, including supporting Research & Development (R&D) activities and Electronic Design Automation (EDA) tool access

R&D Tax Incentives

Pioneer Status and Investment Tax Allowance (ITA) for R&D

- Pioneer Status (PS): Grants companies a 70% tax exemption on statutory income for 5 years for undertaking promoted R&D activities
- Investment Tax Allowance (ITA): Companies can opt for an allowance of 50% of qualifying capital expenditure incurred within 10 years, which can be offset against 70% of statutory income

Contract R&D Company Incentive

- Companies providing R&D services to third parties can apply for: 100% tax exemption of statutory income for 5 to 10 years, or ITA of 50% of qualifying capital expenditure for 10 years

In-House R&D Incentive

- Companies carrying out R&D for their own business purposes may qualify for: 100% tax exemption of statutory income for 5 to 10 years, or ITA of 50% on qualifying expenditures

Double Deduction for R&D Expenditures

- Approved R&D projects may be eligible for double deduction on approved R&D expenses, including wages, utilities, and materials

Role of MIDA (2/3)

Facilitation of EDA Tool Licensing

MIDA works with government-linked initiatives and ecosystem development programs to assist companies, especially SMEs and startups, in accessing advanced semiconductor and electronics design tools. These initiatives include:

National E&E Roadmap / Strategic Initiatives

- MIDA collaborates with the Malaysia Digital Economy Corporation (MDEC) on facilitating access to EDA tools as part of the national strategy to develop the Electrical & Electronics (E&E) ecosystem

Public-Private Collaborations

- MIDA may co-fund or endorse technology centers or incubators that provide shared access to expensive EDA tools.
- Examples: Collaborations with global EDA providers (e.g., Cadence, Synopsys) to license tools to Malaysian universities and design houses at subsidized rates

Smart Automation Grant (SAG) / Industry4WRD

- Though not directly EDA-focused, these grants can support digital transformation, including the adoption of advanced design and simulation tools
- Companies using EDA tools to improve product design and reduce time-to-market can potentially benefit under these schemes

Role of MIDA (3/3)

Additional Support Mechanisms

- **R&D Status Application:** MIDA is the approving authority for companies seeking to obtain "R&D company" status, a prerequisite for many of the incentives
- **One-stop Facilitation:** MIDA offers advisory services, helps navigate incentive applications, and connects companies to funding sources or technical partners
- **Collaboration with MOSTI and MITI:** MIDA often works with the Ministry of Science, Technology and Innovation (MOSTI) and the Ministry of Investment, Trade and Industry (MITI) for funding alignment and policy support

Annex 2 – Market Trends, Strategies and Policy Feedback

Market trends, strategies and policy feedback

New Industrial Master Plan (NIMP 2030) emphasizes advanced manufacturing, digitalization, and ESG

1. Green manufacturing and carbon-reduction technology alignment
2. Regulatory feedback from Dutch stakeholders
3. Role of Malaysian investment promotion agencies

See the following slides for details on the points listed above

Market trends, strategies and policy feedback

1. Green manufacturing and carbon-reduction technology alignment

What's happening

Malaysia's NIMP 2030 emphasizes ESG compliance, promoting advanced manufacturing practices with a strong focus on green technology and decarbonization

What this means for Dutch firms

- Companies with expertise in energy-efficient chip design, cleanroom sustainability, and green supply chains will find strong alignment with national goals
- Dutch firms can differentiate themselves through ESG capabilities – especially in packaging, materials recycling, or low-emission fab processes
- Opportunity to partner with Malaysian firms or MIDA-supported ESG projects to co-develop green solutions

Market trends, strategies and policy feedback

2. Regulatory feedback from Dutch stakeholders

What's happening

Dutch firms entering Malaysia have provided feedback emphasizing the need for:

- Stronger intellectual property enforcement
- Access to skilled technical labor
- Greater regulatory clarity and transparency

What this means for Dutch firms

- Companies should seek proactive engagement with local regulators through industry associations or chambers (e.g., EuroCham Malaysia)
- IP-heavy firms (e.g., EDA tool developers, advanced IC design houses) may want to structure operations with safeguards (e.g., licensing vs. full tech transfer)
- Potential to partner with universities or TVET institutions to shape curriculum around niche skill needs (e.g., RF design, IC testing, photonics)

Market trends, strategies and policy feedback

3. Role of Malaysian investment promotion agencies

What's happening

- Malaysia Investment Promotion Authority (MIDA) is the principal agency in Malaysia that oversees and drives investment into the Advanced Manufacturing and services sectors within the country
- Investment Promotion Agencies (IPA) like InvestSelangor, InvestJohor, and InvestPenang, and the Digital Investment Office (DIO) provide a full spectrum of support for foreign firms entering the market

What this means for Dutch firms

- Dutch companies can fast-track site selection, permits, and tax incentives with these agencies acting as a one-stop shop
- InvestPenang, InvestJohor, and InvestSelangor facilitates connections within the various clusters, ideal for firms in back-end semiconductor processes or R&D
- DIO can assist with digital infrastructure or semiconductor SaaS platforms deployment

Annex 3 – Potential Technological Advancements

Potential technological advancements

Global perspective

Adoption of IoT, sensors, and digital twins enables smarter factories

Increased robotics and automation in production lines

AI/ML applications in semiconductor design and process optimization

Blockchain is emerging for traceability in high-value component supply chains

Strong potential for Dutch-Malaysian collaboration in circular electronics and green manufacturing

The following slides provide more details for each of the points listed above

Potential technological advancements

Smarter factories through IoT, sensors, and digital twins

The integration of IoT, advanced sensors, and digital twins enables real-time monitoring, predictive maintenance, and simulation-based process optimization in semiconductor

Relevance to Malaysia

Malaysia is investing in smart manufacturing under its Industry 4WRD policy, with semiconductor clusters (e.g., Penang, Kulim) ready to adopt advanced digital tools

Opportunities for Dutch companies

- IoT platforms & system integration: Companies like ASML, NXP, or Philips can provide smart fab connectivity solutions
- Digital twin technology providers: Dutch firms with capabilities in simulation and modeling (e.g., Sioux Technologies) can partner with Malaysian fabs
- Collaborative R&D with Malaysian research institutes (e.g., SIRIM, MIMOS) to localize solutions for Southeast Asian fabs

Potential technological advancements

Robotics and automation in production lines

Automation in cleanroom environments is expanding rapidly, with robotics, automated material handling systems and intelligent transport systems enhancing efficiency and reducing contamination risk

Relevance to Malaysia

Malaysian fabs are upgrading to meet global quality standards and reduce dependence on manual labor amid rising wage pressure and talent shortages

Opportunities for Dutch companies

- High-precision robotics providers (e.g., VDL, Demcon) can supply and customize solutions for Malaysian fabs
- Joint ventures with local automation integrators to serve Malaysian and ASEAN markets
- Workforce upskilling programs co-developed with Dutch firms to support the transition to smart automation

Potential technological advancements

AI/ML in design and process optimization

AI and machine learning are revolutionizing semiconductor design, defect detection, yield enhancement, and process control

Relevance to Malaysia

The country is expanding its backend packaging and testing capabilities, where AI/ML can significantly boost quality control and predictive analytics

Opportunities for Dutch companies

- EDA tools and AI frameworks: Collaboration with Malaysian universities and startups to adapt AI tools for local design centers
- Cloud-based analytics platforms developed by Dutch AI firms tailored for process optimization in test & assembly
- Partnering with Malaysian government agencies on AI talent development linked to semiconductor R&D

Potential technological advancements

Blockchain for supply chain traceability

Blockchain provides immutable, transparent tracking of high-value semiconductor components, improving trust, compliance, and counterfeit prevention

Relevance to Malaysia

Malaysia is a global hub for semiconductor packaging and testing, where traceability is critical to maintain client trust in global value chains

Opportunities for Dutch companies

- Blockchain supply chain platforms (e.g., Dutch scale-ups like Circularise) can pilot traceability solutions in Malaysian facilities
- Joint innovation pilots with Malaysian MNC subsidiaries (Infineon, Intel, etc.) using blockchain for ESG and provenance tracking
- Support local implementation of EU supply chain compliance requirements (e.g., CBAM, eco-design directives) through transparent digital ledgers

Potential technological advancements

Circular electronics and green manufacturing

Sustainability is becoming central to semiconductor production. The focus is on resource efficiency, waste reduction, and eco-design

Relevance to Malaysia

Malaysia is aligning with international ESG expectations and aims to position itself as a sustainable electronics manufacturing hub

Opportunities for Dutch companies

- Co-develop circular economy solutions (e.g., take-back schemes, materials recovery) for end-of-life electronics with Malaysian partners
- Supply energy-efficient equipment or green chemicals for semiconductor production
- Lead EU–ASEAN green manufacturing consortia, with Dutch firms offering expertise in circularity and sustainability audits

Annex 4 – Companies in Malaysia

Assessment per segment

#	Specialist Field	Sub-Category
1	Automation Systems	Optical modules

Automation systems (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
SCHOTT	Germany	• SCHOTT is a leading international technology group in the fields of specialty glass and glass-ceramics. SCHOTT Penang was established in 1974 and is a key facility in Asia	• Manufacturing of molded optical blanks for lenses and prisms, glass wafers and structured glass wafers • Process a wide-range of glass products for various applications including industrial, health, datacom and semicon • Specialize in structured glass wafers and packaging **Future strategy** • Long-standing presence in Penang and recently completed a new production facility in Kulim. This indicates a clear strategy for growth and increasing its manufacturing capacity in the region • Emphasizes develop of novel materials and products for future technologies and the Malaysian expansion aims to enhance the processing capabilities for augmented reality optics	1
Ohara Optical Sdn Bhd	Japan	• Ohara has a long-standing global reputation as an optical glass producer • Founded in Malasia in 1991	• Production and sales of optical lens blanks, including reheat press blanks, roller press and rounding & slicing (RS) blanks, long bar blanks, rough ball blanks, and curve generator (CG) blanks • Offer polished lens content inspection and cold process blanks **Future strategy** • Ohara maintains a leading share in the optical glass market and will likely continue to focus on producing high-quality lens blanks for various optical instruments and digital devices (parent company, global) • Ohara aims to supply innovative materials to the global market, including optical and electronics fields. The Malaysian plant likely plays a role in this global supply chain	**1**
Amax Precision Optic Sdn Bhd	Malaysia	• Manufacturer of precision optical components	• Manufacturing of prisms, windows, mirrors, filters, wedges, penta prisms, retroreflectors, and roof prisms • They offer optical fabrication, polishing, and grinding services • Handles mainly small batch quantities **Future strategy** • Their association with Myamax in Malaysia as a partnering manufacturing hub is a key strategic element, providing expanded machining, assembly, and treatment services, as well as access to a talent pool	**1**
Edmund Optics	USA	• A leading global manufacturer and supplier of optical components, imaging lenses, and optomechanical assemblies	• Manufacturing of a wide array of optical components including lenses (spherical, aspherical), prisms, mirrors, beamsplitters, filters, and windows • Their Malaysia facility supports volume production of spherical lenses and prisms	1

Assessment per segment

#	Specialist Field	Sub-Category
1	Automation Systems	Optical modules

Automation systems (2/2)

Company	HQ	Profile	Capabilities	Sub-categories
Canon Opto	Japan	• Canon Opto (Malaysia) Sdn. Bhd. is a pivotal player in Malaysia's semiconductor optics sector, operating as a key manufacturing hub within the global Canon Group. Established in 1988 and located in Shah Alam, Selangor, the facility spans 131,600 square meters and employs over 2,200 personnel	• Canon Opto Malaysia specializes in the production of high-precision optical components, notably EF and EF-M lenses for Canon's EOS camera systems • Spherical Lenses - Utilizing advanced grinding and polishing techniques to achieve submicron precision. • Penta Prisms and Porro Prisms - Essential for image reflection in SLR cameras and binoculars, produced with stringent quality controls • EF and EF-M Lenses - Incorporating technologies like Ultrasonic Motors (USM) for silent autofocus and Image Stabilization (IS) to correct handheld motion	1

Assessment per segment

#	Specialist Field	Sub-Category
2	Wafer foundry, OSAT, and IDM	Silicon-based devices

Wafer foundry, OSAT, and IDM (1/3)

Company	HQ	Profile	Capabilities	Sub-categories
SilTerra Malaysia Sdn Bhd	Malaysia	▪ A pure-play wafer foundry offering various CMOS technologies	• Provides MEMS foundry services, including unique and patented MEMS-on-CMOS technologies. They assist customers from proof of concept to high-volume manufacturing of MEMS devices • Manufacturing of silicon wafers using various CMOS technologies (from 180nm to 110nm nodes). They cater to a wide range of applications, including IoT, power management, consumer electronics, medical, and communication products **Future strategy** • SilTerra's future strategy involves increasing its production capacity and technological capabilities. They invested RM645 million to increase annual capacity by 20% by early 2023 • The company aims to move beyond being just an assembler and become a more significant player in the semiconductor value chain, potentially requiring more capital and ambition for further expansion and technological upgrades	2
Unisem Berhad	Malaysia	• A global provider of semiconductor assembly and test (AT) services	• Offers MEMS packaging solutions, including laminate packages (FBGA/LGA, MCM/SIP, Stacked Die BGA), lead frame packages, leadless packages (SLP, Stacked Die SLP), and specialized MEMS packaging (LGA-FLP, LGA-MCP, LGA-MLP) • They have experience in packaging MEMS for applications like microphones, pressure sensors, and accelerometers **Future strategy** • Unisem anticipates growth in 2025, driven by strong demand for AI-related semiconductors, data centers, and the automotive sector, further supported by the rollout of 5G networks. Their strategy includes focusing on these high-growth areas • They also face challenges such as lower profit margins due to product mix changes and increased operating costs, as well as potential softness in certain market segments • They are also expanding operations in Chengdu, which is expected to contribute to higher volume loading	**2**
Analog Devices	USA	• Analog Devices operates a manufacturing facility in Penang, Malaysia. This site specializes in the assembly and testing of semiconductor components, supporting the company's global supply chain.	• Assembly and Testing: The Penang facility focuses on the final stages of semiconductor manufacturing, including the assembly of integrated circuits and rigorous testing to ensure product quality • Support for Various Products: While specific product lines are not publicly detailed, the facility supports a range of Analog Devices' offerings, potentially including MEMS sensors and other silicon-based components	2

Assessment per segment

#	Specialist Field	Sub-Category
2	Wafer foundry, OSAT, and IDM	Silicon-based devices

Wafer foundry, OSAT, and IDM (2/3)

Company	HQ	Profile	Capabilities	Sub-categories
Nexperia	Netherlands	• A global semiconductor company, formerly part of NXP Semiconductors • They focus on essential semiconductors, logic, MOSFETs, diodes, and protection devices	• Nexperia has manufacturing facilities in Asia, and while they do have operations in Malaysia, the specific details about wafer fabrication versus assembly and test are not explicitly stated • They are a significant player in the semiconductor supply chain and handle silicon wafers as part of their processes **Future strategy** • They recently opened a new global R&D center in Penang, Malaysia, and are enhancing test and assembly capabilities at their Seremban facility, including advanced automation and system-in-package (SIP) capabilities • A significant investment in Malaysia was announced in 2021 to ramp up chip production with a new facility in Negeri Sembilan, aiming to meet growing demand for essential power products, particularly for the automotive industry. Their overall goal is to become a $10 billion company by 2030 through expansion and technological advancements	2
NXP Semiconductors	Netherlands	• A global semiconductor company providing high-performance mixed-signal and standard product solutions	• Similar to Nexperia (from which it partially originated), NXP has a presence in Malaysia • While their primary wafer fabrication might be elsewhere, their Malaysian operations are likely involved in assembly, test, and potentially some level of wafer processing or handling as part of the semiconductor manufacturing lifecycle	2
STMicroelectronics	Switzerland	• A global leader in semiconductor technology with significant operations in Malaysia	• While they have a broad portfolio of standard image sensors, STMicroelectronics also offers custom design services for key customers, including custom sensors, ISPs (Image Signal Processors), and imaging modules • Their focus in Malaysia is on assembly, test and packaging within the semiconductor industry **Future strategy** • STMicroelectronics is strongly focused on achieving carbon neutrality in its operations (Scope 1 and 2 emissions, and partially Scope 3) by 2027, including sourcing 100% renewable energy • In Malaysia, where they have a large-volume test and assembly site in Muar, Johor, they have signed a 21-year Power Purchase Agreement with ENGIE to supply approximately 50 GWh of renewable energy annually from a new solar farm, starting in 2025	2
Onsemi	USA	• A leading supplier of power and sensing technologies with operations in Malaysia	• Offers a wide range of standard image sensors and photodetectors • They also have capabilities in ASIC (Application-Specific Integrated Circuit) technology, which can be leveraged for custom sensor or detector solutions, although their direct custom image sensor design and manufacturing in Malaysia specifically isn't detailed in the initial search **Future strategy** • Onsemi's future strategy involves focusing on long-term opportunities in automotive electrification, industrial energy management, and AI, while streamlining its portfolio by divesting volatile business segments • They are also implementing a restructuring plan involving job cuts globally to improve efficiency. Despite these cost-cutting measures, they intend to continue investing in R&D and are progressing with 200-millimeter silicon carbide wafer production	2

Assessment per segment

#	Specialist Field	Sub-Category
2	Wafer foundry, OSAT, and IDM	Silicon-based devices

Wafer foundry, OSAT, and IDM (3/3)

Company	HQ	Profile	Capabilities	Sub-categories
Globetronics	Malaysia	• As a homegrown company, Globetronics operates multiple facilities in Penang, focusing on semiconductor assembly, testing, and sensor manufacturing	• Sensor Manufacturing: Globetronics has invested in the production of smart sensors for applications in telecommunications and healthcare, such as wearable devices for monitoring diabetic patients and sensors for automotive lighting • Advanced Packaging: The company is expanding into advanced packaging solutions to meet the growing demand for AI-supportive semiconductor chips • Strategic Partnerships: Globetronics has partnered with Taiwan's ChipMOS Technologies Inc to enhance its integrated circuit services, including dicing, packaging, and testing	2
X-Fab	Germany	• X-FAB Sarawak Sdn. Bhd., located in Kuching, Sarawak, is a key manufacturing site within the X-FAB group • The facility specializes in the production of 8-inch silicon wafers using CMOS and HV-SOI technologies	• Wafer Fabrication: The Kuching facility manufactures 8-inch wafers, supporting various processes including 350 nm to 130 nm CMOS logic and mixed-signal technologies • MEMS Production: X-FAB offers MEMS foundry services, including the fabrication of inertial sensors like accelerometers and gyroscopes • Custom Sensors: The company provides manufacturing services for custom image sensors and detectors, such as avalanche photodiodes (APDs) and single-photon avalanche diodes (SPADs)	2

Assessment per segment

#	Specialist Field	Sub-Category
3	IC design	IC design

IC design (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
First Elterra Malaysia Sdn Bhd	Malaysia	▪ A fabless semiconductor company focused on niche industries, including MEMS, analog, mixed-signal, and high-frequency chips	• Design of MEMS devices and other integrated circuits. They collaborate with research institutes and universities in Malaysia and internationally for their development efforts • First Elterra is a semiconductor company, mainly focusing on IC design. In this segment as it is most relevant segment included in the report. • Could also be considered alongside fabless companies including Oppstar, Skyechip, Infinecs, Efinix, and Lattice Semiconductor **Future strategy** • Companies like First Elterra, involved in engineering supplies and services, may find opportunities in supporting the national drive towards higher-value semiconductor activities, including potential involvement in training the targeted 10,000 engineers	**3**
Lattice Semiconductor	USA	• Founded in 1983, Lattice Semiconductor is a publicly traded American company specializing in low-power, small form-factor field-programmable gate arrays (FPGAs) • Their products are utilized across various sectors, including industrial, automotive, communications, computing, and consumer electronics	• Lattice focuses on the design and development of low-power FPGAs and associated software tools • While they are not a traditional IC design house, their expertise lies in programmable logic devices and the development of solution stacks for applications such as machine vision, security, and automotive systems	3
Oppstar	Malaysia	• Established in 2014, Oppstar is a Malaysian company operating in the front end of the semiconductor industry • They offer a comprehensive range of IC design services and have been involved in designing chips used in telecommunications, consumer electronics, industrial electronics, and automotive industries	• Oppstar provides a full spectrum of IC design services, including front-end design, back-end design, and complete turnkey solutions • They have experience with advanced process nodes ranging from 28nm to 3nm and offer services like IP turnkey design and full-product turnkey design	3
Skyechip	Malaysia	• Founded in 2019 by a group of experienced IC designers from multinational corporations, SkyeChip is dedicated to delivering cutting-edge IP and IC solutions for artificial intelligence (AI) and high-performance computing	• SkyeChip specializes in advanced ASIC development, including 6nm and 7nm designs • Their expertise encompasses the development of standard and programmable IPs, system-optimized networks-on-chip (NoC), and high-volume manufacturing enablement	3

Assessment per segment

#	Specialist Field	Sub-Category
3	IC design	IC design

IC design (2/2)

Company	HQ	Profile	Capabilities	Sub-categories
Infinecs	Malaysia	• Established in 2016, Infinecs Systems has become a prominent player in electronic design services, offering comprehensive and innovative IC/SoC design solutions to meet the evolving needs of various industries	• Infinecs provides end-to-end IC/SoC design services, from front-end (RTL) to physical design (GDSII), including specification to RTL, static timing analysis, functional verification, logic synthesis, floor planning, and physical design • They have experience with advanced semiconductor manufacturing nodes, including sub-10nm finFET technologies at both 7nm and 5nm.	3
MaiStorage	Malaysia	• Established in June 2024, MaiStorage is a new IC startup company and a member of the Phison group, the world's leading independent supplier of NAND controller ICs and storage solutions	• MaiStorage focuses on NAND flash controller design and is involved in developing storage technology solutions • Their work includes integrating artificial intelligence (AI) technologies into their IC designs, aiming to make AI accessible to a broader audience in Malaysia	3
Experior	Malaysia	• Experior provides turnkey semiconductor test services for new product introductions and existing products • Their services include test design and development, probe card/load board design and fabrication, and socket/pin solutions for engineering samples to high-volume or high-mix testing	• While Experior primarily focuses on semiconductor testing services, they are a key technology collaborator in initiatives aimed at advancing Malaysia's position in the global IC design and AI sectors	3

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (1/3)

Company	HQ	Profile	Capabilities	Sub-categories
Vitrox Corp. Bhd	Malaysia	▪ A leading global manufacturer of automated vision inspection systems for the semiconductor and electronics industries	• Designs and manufactures complex mechatronic modules that integrate mechanical, electrical, electronic, control engineering, and computer science elements • These modules are core to their vision inspection systems, including motion control stages, robotic handling systems, and integrated sensor modules. They have strong capabilities in precision motion control, image acquisition, and automated material handling • Possesses strong capabilities in assembling highly precise mechanical and electronic components into their vision inspection systems. This involves intricate alignment and integration of optical, mechanical, and electrical elements to achieve high accuracy and reliability • Also specializes in mechatronics automation equipment **Future strategy** • Their emphasis on R&D and global market expansion will likely drive their activities in Malaysia, where they have significant manufacturing and development operations	4,5
Pentamaster Corp. Bhd	Malaysia	▪ Provides factory automation and equipment manufacturing solutions, serving industries such as semiconductor, automotive, medical devices, and consumer electronics	• Designs and manufactures various mechatronic modules as part of their automated equipment. This includes robotic arms, automated assembly modules, material handling systems, and testing modules that integrate sensors, actuators, and control systems • Specializes in the assembly of complex automated equipment, requiring high precision in the integration of mechanical parts, electronic components, and control systems • Also specializes in mechatronics automation equipment and EFEMs **Future strategy** • Their operations in Malaysia serve as a crucial hub for manufacturing and development, and their strategy includes strengthening their capabilities in providing integrated automation systems and expanding their global reach • They are also focusing on innovation to offer more sophisticated and customized automation solutions	4,5,6
Greatech Technology Bhd	Malaysia	▪ A leading industrial automation solutions provider, specializing in the design, manufacturing, and installation of automated equipment	• Develops and produces a range of mechatronic modules for their automation systems. These include robotic systems, automated guided vehicles (AGVs), precision dispensing units, and integrated inspection modules. Their expertise lies in combining mechanical structures with sophisticated control and software systems • Excels in the assembly of large-scale automation systems that demand high precision in the alignment and integration of various modules, including robotic arms, conveyors, and processing units • Greatech designs and manufactures EFEMs, wafer handlers, and other high-precision automation equipment • Their in-house facilities include precision machining, sheet metal fabrication, and system assembly, enabling them to deliver integrated automation solutions • Also specializes in mechatronics automation equipment and EFEMs	4,5,6

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (2/3)

Company	HQ	Profile	Capabilities	Sub-categories
TT Vision Technologies Sdn Bhd	Malaysia	• Designs and manufactures machine vision equipment and solutions for various industries, including solar, LED, and electronics	• Their machine vision systems incorporate complex mechatronic modules, such as precision motion stages for camera positioning and part handling, integrated lighting and sensor modules, and automated inspection units • They focus on high-speed and high-accuracy inspection • Also specializes in mechatronics automation equipment	4,5
Kobay Technology Bhd	Malaysia	• A diversified group involved in precision engineering, manufacturing of automated test equipment, and property development	• Within their precision engineering and automated test equipment divisions, they design and manufacture various mechatronic modules • This includes precision machining of components, assembly of electro-mechanical systems, and integration of sensors and control systems into their test equipment **Future strategy** • For their technology-related activities in Malaysia, their strategy likely involves leveraging their precision engineering capabilities to serve the semiconductor and other high-tech industries • They may focus on expanding their automation solutions and potentially exploring opportunities in niche technology areas	4,5
Neways Electronics	Netherlands	• A global innovator in mission-critical technology for leading semicon, connectivity, and smart mobility companies	• Neways is establishing a new high-tech manufacturing facility in Klang (Selangor), Malaysia • This facility will focus on developing and producing advanced modules and cabinets for the semiconductor sector, indicating involvement in mechatronic modules **Future strategy** • In Malaysia, where they are building a new semiconductor plant in Klang expected to commence production in early 2025, their strategy includes increasing manufacturing capacity to support the growing demand in the semiconductor industry • This new facility will focus on producing advanced modules and cabinets	4,5
SFP Technology	Malaysia	• Established in 2012, SFP Technology began as a sheet metal fabrication company with minor assembly services for the electrical and electronic industry. Over the years, it has expanded its service offerings to include CNC precision machining and mechanical assembly, catering to both local and foreign customers	• Design and Development: The company is involved in the design and development of integrated factory and automated equipment solutions, which are essential in the semiconductor manufacturing process • Precision Machining: Utilizing CNC precision machining, SFP Technology produces high-precision components required for complex mechatronic systems. • Mechanical and Modular Assembly: The company offers mechanical modular assembly services, including equipment and machinery contract manufacturing, which are crucial for building mechatronic modules and precision assemblies	4,5

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (3/3)

Company	HQ	Profile	Capabilities	Sub-categories
SMIF Automation Sdn Bhd	Malaysia	• SMIF Automation is associated with Fortrend, a Taiwanese company specializing in semiconductor automation equipment • SMIF operates within Malaysia's semiconductor ecosystem, providing advanced automation solutions	• SMIF Automation offers EFEMs designed for automated wafer loading and unloading across various wafer sizes • Their products include dual-arm SCARA robots and customizable EFEM systems tailored to specific semiconductor manufacturing needs	6
XTS Technologies Sdn Bhd	Malaysia	• XTS Technologies is a Malaysian company specializing in factory automation • They offer stand-alone robotic automation equipment for production plants	• While specifically mentioning "Wafer Lifter (EFEM)," this indicates their capability in providing equipment related to wafer handling within the front-end module context for the semiconductor industry in Malaysia • They emphasize high quality and cost-effectiveness in their automation solutions	6
MKS Malaysia Sdn Bhd	USA	• MKS Instruments provides instruments, subsystems, and process control solutions for semiconductor manufacturing	• Their Malaysia branch supports sales, service, and component assembly for EFEM-related equipment. • Gas and vacuum handling modules for EFEMs • Control and monitoring systems • Components for wafer handling and environmental control in fabs	6
Veeco Malaysia	USA	• Veeco is known for providing equipment for semiconductor and advanced materials manufacturing, including epitaxy and metrology	• Their Malaysian operations include assembly and technical support for EFEM-related equipment • Semiconductor process tools and subsystems • Precision wafer handling • Metrology and inspection equipment integration	6

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (1/4)

Company	HQ	Profile	Capabilities	Sub-categories
Wong Engineering Corp. Bhd	Malaysia	▪ A leading manufacturer of high-precision component parts in Malaysia since 1982 ▪ They offer a one-stop value-added mechanical solution encompassing the entire supply chain until final assembly	• Precision CNC machining (turning and milling), sheet metal fabrication, surface treatment and finishing, semi-modular and final assembly • They serve diverse industries including electrical & electronic, semiconductor, biotechnology, oil & gas, aerospace, telecommunication, test instruments, automotive, and medical devices **Future strategy** • Their strategy appears to be focused on maintaining their current operations in precision engineering, construction, property development, and investment holding within Malaysia and internationally	7
E-CEN Precision Engineering Sdn Bhd	Malaysia	▪ Providing precision engineering services since 1994, focusing on high quality and cost-effective manufacturing	• CNC milling and turning, vertical milling, lathe machining, surface grinding, jig and fixture manufacturing, pneumatic assembly and automation, and general hardware supply • They have a range of CNC and conventional machines and CMM for quality control **Future strategy** • They aim to enhance manufacturing processes through precision jigs and fixtures, advanced machinery, and comprehensive automation systems • They are also planning to establish production in the Philippines by the end of 2024 or earlier, indicating a regional growth strategy	7
Setsu Precision Engineering	Malaysia	▪ A precision engineering company offering global CNC machining services with a focus on low tolerance parts and complex technical specifications	• Precision CNC milling, turning, wire-cut, cylindrical grinding, and surface grinding with tight tolerances (e.g., ±2-5µm for CNC Wire-Cut). They also design machines and fixtures	7
Impression Edge Group Berhad	Malaysia	• Involved in the manufacturing of high-precision tooling & machining, fabricated parts, jigs and fixtures, and equipment engineering	• High-precision CNC machining, fabrication, design and development, reverse engineering. They serve industries like electronics/semiconductor, solar, plastic and rubber, aerospace, and medical **Future strategy** • They are heavily investing in research and development and expanding their global footprint	7
NSEC Sdn Bhd	Malaysia	• A total precision fabrication and machining solutions provider specializing in high mix, low/mid volume orders since 1986	• High-precision CNC milling and turning, jig and fixture design and fabrication, and strategic alliances for various production processes • They are ISO 9001 certified and serve diverse multinational companies	7

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (2/4)

Company	HQ	Profile	Capabilities	Sub-categories
Arex Precision Manufacturing Malaysia	Japan	• Part of AKITA CO. LTD., Japan • Established in 1995 to manage high-volume production parts, with a large CNC machining facility	• Extensive CNC machining capabilities (milling, turning, etc.) with over 200 machines, capable of handling complex parts with tight tolerances (±0.00X mm). • They offer personalized engineering, process design, and manufacturing solutions **Future strategy** • Their future strategy involves enhancing production capabilities in cleanroom architectural products through advanced automation in their new facility • This expansion aims to cater to high-value manufacturing sectors like semiconductors, electric vehicles, and medical technologies, aligning with Malaysia's industrial growth strategy	7
Tonasco Smart Factory	Malaysia	• A leading precision machining company with a focus on Industry 4.0 technologies for high precision and efficiency	• High-precision CNC machining (milling, turning, grinding), CAM simulation, IoT-enabled tooling, robotic automation, and advanced quality control • They serve various industries and have achieved tight tolerance capabilities (± 0.002mm)	7
Ares Precision Machinery Technology	Malaysia	▪ Established in 2023, specializing in ODM/OEM production with integrated machining, assembly, and testing	• CNC machining (milling, turning, grinding, EDM, laser cutting) for metal and plastic components with precision up to ±0.02mm, die casting, 3D printing, and custom assembly • They serve industries like life sciences, medical technology, optics, and aerospace **Future strategy** • Their strategy focuses on being a reliable partner in precision manufacturing, specializing in ODM/OEM production for industries like life sciences, medical equipment, and aerospace	7
SSW Precision Engineering Sdn Bhd	Malaysia	▪ An engineering support company offering precision engineering and CNC machining services since 2009	• Precision engineering design, CNC machining (milling, turning), automation parts manufacturing, and jig and fixture fabrication • They serve aerospace, medical, automation, and semiconductor industries	7
Microntech Technology Sdn Bhd	USA	▪ Specializes in precision machining services with a focus on quick turnaround for high-mix low-volume components	• Precision CNC milling (3, 4 & 3+2 axis), CNC turning, CNC wire-cut, CNC EDM, and precision surface grinding • They offer material certification and have CMM for quality inspection	7

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (3/4)

Company	HQ	Profile	Capabilities	Sub-categories
Coraza Systems	Malaysia	• Established in 2001, Coraza is a vertically integrated engineering solutions provider offering services from design and development to product delivery • The company specializes in high-precision sheet metal fabrication, precision machining, and electromechanical assembly, serving industries such as semiconductors, aerospace, and medical devices	• Coraza provides precision-machined components using CNC milling, turning, and turn-milling processes • They also offer finishing services like powder coating, anodizing, and laser marking, supporting high-mix, low-volume production for semiconductor application	7
KW Precision	Malaysia	• Founded in 2004, KW Precision Engineering is a Malaysian-based precision component manufacturer • The company offers high-quality precision machining, sheet metal fabrication, welding, and parts assembly services to various industries, including electronics, oil and gas, and data storage	• KW Precision provides CNC precision machining services, including CNC milling, turning, and auto lathe operations • Their facilities can handle various material types and thicknesses, supporting both prototyping and full production runs	7
Northeast Group Bhd	Malaysia	▪ Founded in 2004, Northeast Group specializes in manufacturing precision engineering components for industries such as photonics, semiconductors, and telecommunications ▪ The company offers services including process engineering, precision machining, surface finishing, sheet metal fabrication, and mechanical sub-assembly	• Northeast Group provides in-house precision machining and surface finishing services, catering to both local and international clients in the semiconductor industry	7
Kemikon	Malaysia	▪ Kemikon is a specialized contract manufacturer for the semiconductor and high-tech equipment industry ▪ The company focuses on producing machine frame structures, sheet metal parts, and mechanical and electrical assemblies	• Kemikon has developed core competencies in frame structure welding and powder coating, essential for manufacturing capital equipment for the semiconductor industry • Their expertise supports the production of complex mechanical assemblies	7
KW Precision	Malaysia	▪ KW Precision Engineering is a Malaysian company based in Penang ▪ They specialize in high-quality precision machining and sheet metal fabrication services for various industries, including the Electronics and Electrical (E&E) sector	• KW Precision's core capabilities lie in precision machining and fabrication. This suggests they can manufacture high-precision components that might be used in various machine conditioning systems within semiconductor manufacturing equipment. However, they are likely a component supplier rather than a direct manufacturer of complete machine conditioning modules • Their capabilities could contribute to: Layout products: They can fabricate precise metal structures and components that form part of the layout and framework of machine conditioning systems • Pneumatic and vacuum components: Their machining expertise could be used to manufacture parts for pneumatic and vacuum systems integrated into semiconductor equipment • Fluid power components: Similarly, they might produce components for fluid power systems	7

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (4/4)

Company	HQ	Profile	Capabilities	Sub-categories
Virtue Technologies	Malaysia	▪ Founded by Dutch engineers, Virtue Technology operates high-precision CNC tool shops in Asia, specializing in product development and manufacturing for European and American companies	• Virtue Technology manufactures precision parts, spares, jigs, and fixtures, handling volumes ranging from single pieces to over 1,000 units • They also design, assemble, and debug complete tool sets and systems, catering to the semiconductor industry's high-precision requirements	7
UWC Group Bhd	Malaysia	• UWC Berhad is a leading precision engineering company specializing in CNC machining, sheet metal fabrication, and assembly services • The company serves critical sectors, including semiconductors, life sciences, and telecommunications	• UWC offers high-speed CNC precision laser cutting and machining services, processing custom sheet metal jobs quickly and accurately • Their advanced CNC laser systems enable precision quality cutting of various metals, supporting the semiconductor industry's stringent requirements	7
Prodelcon	Malaysia	• Prodelcon specializes in high-precision machining and assembly of RF microwave parts, surgical instruments, and photonics components • The company also designs and manufactures customized integrated automation equipment and precision semiconductor molds and die sets	• Prodelcon offers high-speed CNC machining with full 5-axis milling centers, capable of handling hard-to-machine materials • Their experienced team ensures that all parts meet stringent finish and accuracy requirements, supporting the semiconductor industry's high-precision needs	7
Benchmark Electronics	USA	• Part of Benchmark Electronics, USA • Offers precision machining and large-scale electro-mechanical assembly services, particularly for the semiconductor capital equipment industry	• Precision CNC 5-axis milling and turning, advanced metal joining (MIG & TIG), full sheet metal fabrication and assembly, and complex electro-mechanical assembly in cleanroom environments • They hold various certifications including ISO 9001, ISO 13485, and AS9100 **Future strategy** • Their future strategy involves expanding their presence in Penang, Malaysia, with a fifth facility. This expansion aims to enhance their capacity to serve customers in high-growth industries such as aerospace, semiconductor capital equipment, and medical technologies	7
Alpha Precision Turning and Engineering Sdn Bhd	Malaysia	• Alpha Precision Turning & Engineering Sdn Bhd is a leading Malaysian precision machining specialist based in Kulim Industrial Estate, Kedah, founded in 1985	• Extensive CNC Capacity: Over 200 centers with 3-9 axis machining enabling intricate component production • Exotic Material Expertise: Proficiency in machining difficult alloys like Inconel, Titanium, Monel for critical industrial applications • End-to-End Processing: In-house and outsourced secondary processes ensure high-quality finishes and assembly-ready outputs • Sector Breadth: Serves high-demand industries including aerospace, oil & gas, semiconductor, E&E, and medical, requiring precision and reliability	7

Assessment per segment

#	Specialist Field	Sub-Category
8	Surface treatments	Surface treatments

Surface treatments (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
UKL Surface Treatment & Finishing	Malaysia	▪ A surface treatment and finishing corporation known for industrial coatings, spray painting, and glass coating projects	• Industrial coatings, spray painting (including precision spraying), and glass coating • They cater to high and low volume production and emphasize high-quality finishes, suggesting they support OEM needs • UKL offers aluminum anodizing services, adhering to MIL-A-8625 military specifications. While their website details their anodizing processes, it does not explicitly mention electrolytic color anodizing	8
Switch Flow	Malaysia	▪ Specializes in providing custom-built metal surface treatment plants and services	• Electroplating (including custom services), anodizing, nickel plating, electrode deposition process, and EN plating • Their focus on custom solutions for various industrial applications indicates involvement in OEM supply chains	8
ULVAC Malaysia Sdn Bhd	Japan	▪ Part of a global corporation, providing various solutions in surface treatment technology for diverse industries	• Abrasive treatment (media blasting), thermal spray (arc, flame, and plasma coatings), chemical treatment, surface blasting, surface coating, and cleanroom processing • Their wide range of services and large facilities suggest they support significant OEM manufacturing • Cleanroom Capabilities: ULVAC Malaysia is equipped with a class-10 cleanroom facility used for process development, customer demonstrations, and manufacturing of semiconductor equipment	8
MCC Coating Sdn Bhd	Malaysia	• Specializes in metal protective coatings and is the sole licensed GEOMET & DACROMET metal coating company in Malaysia	• GEOMET treatment, DACROMET treatment, cathodic electro deposition treatment, and wet spray coating • These specialized coatings are crucial for OEM industries requiring high corrosion resistance	8
Fukar Sdn Bhd	Malaysia	• Provides electroplating, coating, and metal surface finishing services, aiming to be a valued partner to their clients	• Xylan fluoropolymer coatings, phosphating, electroplating, and other metal surface treatments • Their emphasis on consultancy, testing, and quality suggests they integrate into OEM quality control processes • Fukar provides anodizing services for aluminum and its alloys. However, specific details about electrolytic color anodizing are not provided	8

Assessment per segment

#	Specialist Field	Sub-Category
8	Surface treatments	Surface treatments

Surface treatments (2/2)

Company	HQ	Profile	Capabilities	Sub-categories
Landchart Sdn Bhd	Malaysia	• An ISO 9001 and ISO 14001 certified company specializing in electroplating and surface coatings for a broad range of applications	• Plating and coatings for various substrates (ferrous, aluminum, zinc, copper alloys), with a focus on quality, fast turnaround, and cost-efficiency, making them suitable for OEM supply chains	8
Micro Surface Treatments Sdn Bhd	Malaysia	• Provides high-quality rack electroplating services to manufacturers across various industries, certified by ISO 9001 and Nadcap	• Electroless nickel plating, anodizing, gold plating, chemfilm conversion, and powder coating • Their certifications and broad service range indicate support for stringent OEM requirements	8
RSE Technologies Sdn Bhd	Malaysia	• Established in 2019, RSE Technologies Sdn. Bhd. specializes in providing high-quality surface finishing services for aluminum and other metals. With over 20 years of experience in the surface finishing industry, the company serves various sectors, including industrial, automotive, electronics, and engineering	• RSE Technologies offers a comprehensive range of surface treatment services, including: • Electroless Nickel Plating: Provides uniform coating thickness and excellent corrosion resistance, suitable for complex geometries • Trivalent Chromate: An environmentally friendly alternative to hexavalent chromate, offering corrosion protection for aluminum and other metals • E-Coating (Electrophoretic Deposition): Delivers uniform coating coverage, even on intricate parts, enhancing corrosion resistance and aesthetic appeal • Micro-Arc Oxidation (MAO)/Plasma Electrolytic Oxidation (PEO): RSE Technologies established Malaysia's first MAO/PEO production line, providing hard, wear-resistant, and corrosion-resistant ceramic-like coatings on aluminum substrates	8

Assessment per segment

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Machine conditioning (1/4)

Company	HQ	Profile	Capabilities	Sub-categories
CKD Malaysia Sdn Bhd	Japan	▪ Part of CKD Corporation, Japan ▪ A leading manufacturer of automation components, including pneumatic and fluid control equipment	• While primarily known for pneumatics, their range includes gas handling components such as air preparation units (filters, regulators, lubricators), pressure sensors, and flow control valves, which are essential for conditioning compressed air and other gases in automated machinery • Extensive range of pneumatic cylinders, valves (directional control, pressure control, flow control), actuators, air preparation units, fittings, and tubing	9,12
SMC Automation Sdn Bhd	Japan	▪ Part of SMC Corporation, Japan ▪ A global leader in pneumatic and automation technology	• Extensive range of air preparation equipment (filters, regulators, lubricators), dryers, mist separators, and various types of valves and actuators for controlling the flow and pressure of gases used in industrial automation • Comprehensive portfolio of pneumatic cylinders, rotary actuators, grippers, valves (solenoid, air-operated, manual), air preparation equipment, vacuum components, and related accessories • Extensive range of vacuum ejectors, vacuum pumps, vacuum pads, vacuum filters, and vacuum switches for material handling and automation applications	9,12,13
Norgren (IMI Precision Engineering)		▪ A global leader in fluid and motion control technologies	• Offers a wide array of gas handling products, including air preparation units, pressure regulators, proportional valves for gas control, and high-purity gas handling components for specialized applications • Wide range of pneumatic actuators (cylinders, rodless cylinders, rotary actuators), valves, air preparation units, fittings, and pressure switches	9,12
Parker Hannifin Malaysia Sdn Bhd	USA	• Part of Parker Hannifin Corporation, USA • A global leader in motion and control technologies, providing a wide range of products and systems	• Offers various gas handling components, including filters, regulators, flow control valves, and quick couplings for pneumatic and fluid systems • Their products cater to diverse industrial applications requiring conditioned gas • Offers a broad spectrum of pneumatic cylinders, valves, air preparation units, fittings, and tubing for various industrial applications • Comprehensive range of hydraulic pumps, motors, valves (directional, pressure, flow), cylinders, accumulators, filters, hoses, and fittings for hydraulic systems	9,12,13
LAUDA Noah Sdn Bhd	Germany	• A leading manufacturer of constant temperature equipment and systems for industrial, research, and medical applications	• Industrial circulation chillers, process thermostats, heat transfer systems, and cooling systems designed for precise temperature control in machinery and processes	10

Assessment per segment

Machine conditioning (2/4)

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Company	HQ	Profile	Capabilities	Sub-categories
Ultra Clean Technologies (UCT)	USA	▪ UCT has a significant presence in Malaysia with a manufacturing facility in Pulau Pinang. This facility underscores their commitment to business continuity and serving their global customer base, including those in the semiconductor sector in the region ▪ The Malaysia operations include precision machining and chemical & gas delivery system integration	• Capabilities in Malaysia (Machine Conditioning): Based on their global and Malaysian profiles, UCT's capabilities in Malaysia related to machine conditioning likely include: • Gas handling: Integration of ultra-clean gas delivery systems, manifolds, and related components. Their products globally include ultra-clean valves, high-purity connectors, and pneumatic actuators, which are crucial for precise gas control in semiconductor manufacturing equipment • Fluid power components: As they integrate fluid delivery systems, they likely handle related fluid power components in their Malaysian operations • Cleaning & verification: While their cleaning and analytical services might not be explicitly mentioned for the Malaysian facility, UCT is a leading provider globally, suggesting some level of cleaning or integration of cleaned components occurs in Malaysia	9,12,14,15
MKS Instrument	USA	▪ MKS Instruments is significantly expanding its presence in Malaysia. They are building a "Super Center" factory in Penang to support the growing needs of semiconductor equipment for wafer fabrication, both regionally and globally ▪ The groundbreaking ceremony occurred in late 2024, with the first phase of the 500,000 sq ft facility expected to be completed in the first half of 2026. This new plant will enhance their manufacturing capabilities in Malaysia	• While the new facility is still under construction, MKS's global profile indicates they provide foundational technology solutions critical for machine conditioning in semiconductor manufacturing. Once operational, the Malaysian plant will likely support the production of: • Vacuum: MKS is a major global supplier of vacuum technology, including pressure measurement and control devices essential for maintaining vacuum conditions in semiconductor processing equipment • Gas handling: They offer gas delivery systems and components for precise control of process gases. • Power delivery: Their power delivery solutions are crucial for the operation of various components within semiconductor manufacturing equipment • Process control: MKS provides systems for monitoring and controlling various parameters in semiconductor manufacturing processes	9,13,14

Assessment per segment

Machine conditioning (3/4)

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Company	HQ	Profile	Capabilities	Sub-categories
Rose Systemtechnik Sdn Bhd	Germany	• Part of Phoenix Mecano AG, Germany • Specializes in industrial enclosures, profile systems, and suspension systems	• Provides modular aluminum profile systems that can be used to build machine frames, guarding, and workstations, contributing to the physical layout and safety of machinery	11
Festo Sdn Bhd	Germany	▪ Part of Festo SE & Co., Germany ▪ A global supplier of automation technology and a world leader in industrial training and education programs	• Comprehensive range of pneumatic and electric drive technology, including cylinders, valves, valve terminals, air preparation units, fittings, and tubing • Offers various vacuum technology components, including vacuum generators (ejectors), vacuum pumps, suction cups, vacuum switches, and accessories for automation and handling tasks	11,13
Busch Vacuum Solutions	Germany	• One of the largest manufacturers of vacuum pumps, blowers, compressors, and systems worldwide	• A wide range of vacuum pumps for various industrial applications, 20including rough, fine, and high vacuum technologies	13
ULVAC Malaysia Sdn Bhd	Japan	• Part of ULVAC, Inc., Japan • Provides vacuum equipment, thin-film deposition systems, and surface treatment technologies	• Offers a variety of vacuum pumps and vacuum systems used in industrial processes, research, and manufacturing	13
Bosch Rexroth Sdn Bhd	Germany	• A leading global supplier of industrial and mobile hydraulics, electric drives and controls, gear technology, and linear motion and assembly technology	• Extensive portfolio of hydraulic pumps, motors, valves, cylinders, power units, and electronic controls for hydraulic systems	14

Assessment per segment

Machine conditioning (4/4)

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Company	HQ	Profile	Capabilities	Sub-categories
Eaton Hydraulics	USA	• Likely services Malaysia (regional presence) • A global leader in power management, providing hydraulic, electrical, and mechanical power solutions	• Offers a wide range of hydraulic pumps, motors, valves, cylinders, hoses, and fittings for various industrial and mobile applications	14
Hextar Group	Malaysia	• Market leader in specialty cleaning products for institutional, manufacturing, and industrial markets in Malaysia	• Formulates and produces a range of cleaning agents such as detergents, sanitizers, and degreasers for various applications including food & beverage, housekeeping, and industrial machinery	14
Dpstar Group	Malaysia	• Leading provider of calibration services in Malaysia with over 30 years of experience	• Offers a wide range of calibration services to verify various types of measurement equipment and instruments used in industrial settings	15
Sendi Mahir Sdn Bhd	Malaysia	• One of the largest Conformity Assessment Bodies in Malaysia, accredited by SAMM (Laboratory Accreditation Scheme of Malaysia)	• Provides extensive calibration services in dimensional, mass, force, torque, pressure, flow, electrical, temperature & humidity, and optical & photometric measurements • Sendi Mahir specializes in precision engineering and machining, fabricating high-quality parts and components crucial for the advanced manufacturing processes	15
Obsnap Calibration Sdn Bhd	Malaysia	• Offers professional calibration services in Malaysia, accredited to MS ISO/IEC 17025 and ILAC MRA	• Provides calibration services to reduce measuring errors and comply with international standards • Obsnap Calibration offers vital calibration services for a wide array of measuring and test equipment, ensuring the accuracy and reliability necessary for quality control in advanced manufacturing	15
Premier Calibration Malaysia	Malaysia	• ISO accredited third-party independent calibration services provider in Malaysia	• Offers both on-site and off-site calibration services for various instruments, including thermometers, weighing scales, pressure gauges, and more • Premier Calibration provides essential calibration and testing services for industrial equipment, ensuring the precision and quality required in the advanced manufacturing sector	15

Assessment per segment

#	Specialist Field	Sub-Category
16	Software	Activities – Services
17		Functions – System software
18		Functions – Software for hardware modules

Software (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
Infinecs Systems	Malaysia	• Malaysian IC design house offering end-to-end design services for analog, digital, and mixed-signal semiconductors	• Specializes in IC design automation, verification, layout, and software development for chip design tools and methodologies	16
ViTrox Corporation Bhd	Malaysia	• Publicly listed tech company providing automated vision inspection and test systems for semiconductor and electronics	• Develops smart inspection software (e.g., for AOI, AXI, AVI) and the V-ONE platform – an Industry 4.0 manufacturing intelligence system for semiconductor production lines	16
Critical Manufacturing	Malaysia	• Subsidiary of ASMPT, offering next-generation Manufacturing Execution Systems (MES) for high-tech industries	• Provides highly configurable MES software for semiconductor fabs and OSATs (Outsourced Semiconductor Assembly and Test), supporting traceability, automation, and analytics	16
Malaysia Semiconductor IC Design Park	Malaysia	• National initiative fostering innovation and infrastructure for Malaysia's semiconductor design ecosystem	• Hosts and supports software development for IC design, EDA tools integration, simulation platforms, and collaborative R&D in semiconductor software and hardware co-design	16
Siemens Malaysia Sdn Bhd (Digital Industries)	Germany	• A technology powerhouse focused on industry, infrastructure, transport, and healthcare. Their Digital Industries division focuses on automation and digitalization	• Offers a comprehensive suite of software for the digital enterprise in manufacturing and semiconductor, including Teamcenter (PLM), Opcenter (MES/MOM - Manufacturing Operations Management), TIA Portal (Totally Integrated Automation Portal for automation control), and simulation software • Their solutions enable digital twins, virtual commissioning, and end-to-end digitalization of the value chain	16
AVEVA Sdn Bhd	UK	• A global leader in industrial software, driving digital transformation for industrial organizations	• Offers a range of software solutions for engineering & simulation, operations & control (including HMI/SCADA and MES), and asset performance management • Their software is used for process design, plant optimization, real-time operational intelligence, and predictive maintenance in complex manufacturing and semiconductor facilities	16
Applied Materials SEA	USA	• A global leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world	• While primarily a equipment supplier, Applied Materials also provides software and analytics solutions to optimize equipment performance, process control, and yield in semiconductor manufacturing • This includes process control software, fault detection and classification (FDC) systems, and data analytics tools specific to semiconductor fabrication	16
Lam Research International Sdn Bhd	USA	• A global supplier of innovative wafer fabrication equipment and services to the semiconductor industry	• Similar to Applied Materials, Lam Research provides software solutions that interface with their equipment for process control, data monitoring, and equipment diagnostics in semiconductor manufacturing environments	16

Assessment per segment

#	Specialist Field	Sub-Category
16	Software	Activities – Services
17		Functions – System software
18		Functions – Software for hardware modules

Software (2/2)

Company	HQ	Profile	Capabilities	Sub-categories
Intel Malaysia Sdn Bhd	USA	• A global leader in semiconductor design and manufacturing. Intel has a significant presence in Malaysia, primarily focused on assembly and test, but also with engineering and design capabilities	• While a major chip manufacturer, Intel's engineering teams in Malaysia are involved in developing and validating firmware, BIOS, and low-level software that directly interacts with their hardware • This includes software for test equipment used in their assembly and test facilities, as well as contributions to broader system-level software for computing platforms used in manufacturing environments	17,18
AMD Global Services Sdn Bhd	USA	• A global semiconductor company that designs and integrates technology for intelligent devices. AMD has a significant design and development center in Malaysia	• AMD's Malaysian teams are involved in the design and development of software and firmware for their processors and GPUs • This includes low-level software that interfaces with hardware modules, as well as drivers and system software that are crucial for the performance and functionality of computing systems used in advanced manufacturing for tasks like simulation, data analysis, and control	17,18
ARM Ltd	UK	• Malaysia Design Center Sdn Bhd • A leading provider of processor IP and related technologies. ARM's designs are at the heart of billions of devices worldwide	• The design center in Malaysia contributes to the development and validation of processor architectures and related system software • This includes firmware, drivers, and software development tools that enable chip manufacturers and system integrators to effectively utilize ARM-based hardware in embedded systems and other applications relevant to advanced manufacturing equipment	17,18
National Instruments (NI) Malaysia Sdn Bdh	USA	• A leading provider of platform-based systems that enable engineers and scientists to solve the world's greatest engineering challenges	• NI develops hardware and software platforms for automated test and measurement, data acquisition, and control. Their software, such as LabVIEW and TestStand, directly interfaces with their modular hardware (e.g., PXI, CompactRIO) and third-party instruments • This is crucial for building custom test systems and control applications in semiconductor manufacturing and advanced manufacturing	17,18
Keysight Technologies Malaysia Sdn Bdh	USA	• A leading technology company that helps enterprises, service providers, and governments accelerate innovation to connect and secure the world	• Keysight provides a wide range of electronic test and measurement equipment • Their Malaysian operations include manufacturing and potentially software development related to their instruments • This includes instrument drivers, control software, and data analysis tools that allow users to interface with and program their hardware for testing semiconductors and electronic components used in advanced manufacturing	17,18
Nexperia	Netherlands	• A global semiconductor company, formerly part of NXP Semiconductors	• As a semiconductor manufacturer, Nexperia develops firmware and software for their devices, which are used in various advanced manufacturing applications. Their Malaysian operations could include some level of software or firmware development, or support related to their products	17,18
NXP Semiconductors	Netherlands	• A global semiconductor company providing high-performance mixed-signal and standard product solutions	• Similar to Nexperia, NXP develops embedded software and firmware for their semiconductor solutions, which are utilized in advanced manufacturing systems. • Their Malaysian presence might involve software-related activities	17,18

Additional information

#	Specialist Field	Sub-Category
16	Software	Activities – Services
17		Functions – System software
18		Functions – Software for hardware modules

Software

Company	Third-party software	Explanation	Embedded systems	Explanation
Applied Materials	*Internal only*	Not a software vendor in the traditional sense. However, their tools are software-driven (e.g., automation, process control), and they develop proprietary software for their own equipment.	*Internal use*	Not a software vendor in the traditional sense. However, their tools are software-driven (e.g., automation, process control), and they develop proprietary software for their own equipment.
Lam Research	*Internal only*	Like Applied Materials, Lam develops internal software for tool control and data analytics.	*Internal use*	Their tools use embedded systems, but again, not sold as standalone products
Intel Malaysia		Intel globally provides software development tools (e.g., Intel OneAPI, compilers, etc.), and firmware for its hardware.		Yes, Intel designs processors for embedded systems (e.g., Atom, Xeon D, etc.). These are used in everything from automotive to IoT.
AMD Global Services		AMD offers drivers, SDKs (like ROCm, FidelityFX), and development tools.		AMD sells embedded processors (e.g., Ryzen Embedded, EPYC Embedded), used in edge computing, industrial, and medical.
Keysight Technologies		They offer a wide range of third-party software tools for test automation, data analysis, and simulation (e.g., PathWave, BenchVue).	*Internal use*	Their test equipment often includes embedded systems, but they don't sell embedded platforms themselves.
Nexperia		Not a software vendor.		They do not provide full embedded systems, but their components (e.g., diodes, MOSFETs) are often used *in* embedded systems.
NXP		NXP provides SDKs, middleware, and development tools.		Their chips (e.g., i.MX, LPC, S32K) power many embedded systems globally.

Yes
No

Annex 5 – Companies in the Netherlands

Assessment per segment

#	Specialist Field	Sub-Category
1	Automation Systems	Optical modules

Automation systems

Company	HQ	Profile	Capabilities	Sub-categories
NTS Optel	Netherlands	• NTS Optel is s a solution provider that develops and assembles complex optical, laser and opto-mechatronic tooling, systems, and modules. • The company was established in 1986 and is located in Nijmegen as part of the NTS Group	• NTS develops, manufactures and assembles customized opto-mechatronic systems, optical measurement and nanostructure testing solutions • NTS houses both development and production capabilities together and partners with OEMs to get a best-fit design and build a working prototype quicker. • For these operations they rely on their domain expertise and state of the art facilities	1
LioniX International	Netherlands	• LioniX International is a leading supplier of microsystem solutions, specializing in integrated photonics and customized MEMS devices • The company was formed in 2016, following the acquisition of SATRAX, XiO Photonics and LioniX	• LioniX International is equipped with high-resolution optical sensors capable of precise yet complex tasks • The company integrates multispectral imaging capabilities, enabling enhanced perception across different light wave lengths, thus improving performance in low-light or visually complex environment	1
Neways	Netherlands	• Reputable actor in design and production services for electronic components and systems • Founded in 1969 in Eindhoven as a spin-off of Philips	• Neways has more than 30 years experience in opto-electronics for sensing and detecting purposes • The company specializes on integrating photonic components and modules into electronics	1
Demcon Group	Netherlands	• A reputable developer and manufacturer of various technology and innovation products for multiple markets often offering “turn-key” solutions • The company was established in 1993 and is headquartered in Enschede with 9 locations across the Netherlands and Germany	• “Demcon focal”, as a division of Demcon Group, specializes in the design, engineering and assembly of custom optomechatronic and vision systems • Through this division, Demcon serves a variety of high-tech markets, such as the semiconductor industry, medical sector, industrial production and aerospace	1
Hittech Group	Netherlands	• Dutch high-tech engineering and precision manufacturing company founded in 2004, with over 700 employees across nine sites in the Netherlands, Germany, and Malaysia • It is a leading integrated systems supplier, delivering highly complex mechanical and mechatronic components and assemblies to blue-chip OEMs in semiconductor, MedTech, robotics, automation, analytical instruments, aerospace, and more	• High-Precision CNC Machining: 3-5 axis milling, turning, tight-tolerance complex parts • Automation & Robotics: Robotic handling and unmanned production for scalability • Advanced Metrology: Climate-controlled QA labs with 3D measurement systems • Systems Integration: End-to-end assembly of complex mechatronic systems • Additive Manufacturing: Titanium AM and near-net-shape production with partners • Aerospace & Semiconductor Ready: AS9100 certification and high-tech sector focus	1

Assessment per segment

#	Specialist Field	Sub-Category
2	Wafer foundry, OSAT, and IDM	Silicon-based devices

Wafer foundry, OSAT, and IDM (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
LioniX International	Netherlands	• LioniX International is a leading supplier of microsystem solutions, specializing in integrated photonics and customized MEMS devices • The company was formed in 2016, following the acquisition of SATRAX, XiO Photonics and LioniX	• LioniX International is presents itself as a MEMS foundry with capabilities for volume fabrication of existing MEMS designs as well as the co-development of novel devices • Their strength lies in the fact that they have strong capacities in developing custom MEMS manufacturing processes, from concept drawings to mask set in order to precisely meet the specifications of their clients	2
XIVER	Netherlands	• XIVER is a leading pure-play MEMS foundry specialized in process development, industrialization, and manufacturing of thin-film and MEMS devices • The company was founded in January 2025 following the acquisition of Philips' MEMS chip factory by Dutch investors	• Utilizing proven process technologies and key-enabling IP-backed platforms, XIVER delivers tailored solutions to its customers active in various markets and applications, including Industrial, Medical, Photonics, and Automotive • Beyond its foundry services, XIVER offers innovative solutions, such as its cutting-edge CMUT ultrasound platform that powers the next generation of interventional, portable point-of-care and wearable ultrasound imaging devices • As many other companies located in the Eindhoven city region, XIVER is leveraging decades of innovation and expertise from its “Philips heritage” by being one of its many spin-offs	2
Smart Photonics	Netherlands	• Smart Photonics is a company acting as an independent, “pure-play” foundry producing high-end photonic integrated circuits (PICs) for their customers • The company was founded in 2012 in Eindhoven	• The company offers the complete production process of PICs from epitaxial growth and re-growth, processing, polishing and dicing of wafers into chips • Being a foundry, they also spined offer single or combined process steps to complete or being a back-up for the production processes of customers • SMART Photonics is one of the first integrated photonics foundries offering 4-inch InP wafer production	2
Besi	Netherlands	• A global leader in the packaging and assembly equipment that turns silicon wafers into high-performance modules • The company was formed in 1995 in Duiven	• Besi designs and manufactures equipment for die attach, packaging and wafer-level processes, crucial for assembling devices like image sensors and advanced detectors • In addition, Besi plays a critical role in wafer-level assembly and integration technologies, including fan-out packaging, chip stacking. and flip-chip bonding	2

Assessment per segment

Wafer foundry, OSAT, and IDM (2/2)

#	Specialist Field	Sub-Category
2	Wafer foundry, OSAT, and IDM	Silicon-based devices

Company	HQ	Profile	Capabilities	Sub-categories
Nearfield Instruments	Netherlands	• A semiconductor metrology equipment producer developing and delivering ground-breaking process control metrology solutions • The company was founded in January 2016 as a spin-off of TNO, the Dutch statutory research organization focusing on applied science	• The company develops non-destructive, high-resolution metrology tools that scan semiconductor wafers during production activities • The technologies of Nearfield Instruments help production facilities optimize their wafer fabrication, especially in EUV lithography, 3D NAND and in advanced logic	2
Amsterdam Scientific Instrument (ASI)	Netherlands	• An emerging leader in the field of hybrid pixel detectors and scientific imaging systems • The company was founded in 2011 in Amsterdam as a spin-off of Nikhef and AMOLF	• ASI designs and produces high-end hybrid pixel detectors and cameras, based on CERN's chip technology, tailored for electron, X-ray, and ion detection in scientific, medical as well as industrial environments • The company integrates custom application-specific integrated circuits and sensor layers bonded at the wafer level, hence allowing them to provide custom image detectors and specialized camera systems	2
Nexperia	Netherlands	• A global leader in discrete components, logic devices, and MOSFETs, focusing on high-volume production with facilities in Europe and Asia • The company was formed in Nijmegen as a spin-off from NXP in 2016 and has five production location spanning Europe and APAC	• Nexperia owns and operates wafer production facilities which are focal parts of many value chains industries and domains related to this domain • The company is also supported by ITEC – its internal division that used to be a packaging semiconductor equipment and automation division of Philips	2
DEMCON	Netherlands	• Manufacturer of precision optical components • The company was established in 1993 and is headquartered in Enschede with 9 locations across the Netherlands and Germany • Demcon specializes in optics through its "Demcon focal" division	• Through the "Demcon focal" division, the company offers strong capabilities in in designing and developing optical systems and metrology solutions. • In addition to that, the mentioned division focuses on imaging and vision technologies, integrating optics, mechanics as well as electronics into comprehensive solutions • The division is also well-versed in lithography lens design which allows them to deliver and qualify precision optical assemblies used in semiconductor manufacturing	2

Assessment per segment

#	Specialist Field	Sub-Category
3	IC design	IC design

IC design

Company	HQ	Profile	Capabilities	Sub-categories
IC Design Services BV	Netherlands	• Specializes in analog modules for ASICs, focusing on low-power and robust IC designs in challenging technologies	• Over 20 years of experience in analog mixed-signal and RF CMOS design, offering consultancy services and expertise in design for manufacturing (DFM)	3
Tegra IC	Netherlands	• A joint venture between ElectraIC and ATEK MIDAS, providing comprehensive IC design services including Analog/RF, Digital IC, and Embedded Software Design	• Offers turnkey solutions from IP core development to full equipment-level solutions, with in-house test laboratories equipped for evaluations up to 40 GHz	3
SystematIC	Netherlands	• Develops analog and mixed-mode integrated circuits, providing design services like feasibility studies, system or IC architecture investigation, circuit design and simulation, and layout generation	• Expertise in sensor interfacing, power conversion, and high-voltage applications, with a strong collaboration with the Technical University of Delft	3
Delft Semiconductor	Netherlands	• Specializes in developing low-power, ultra-precision analog and mixed-signal conditioning ICs, essential in semiconductor applications	• Focuses on precision sensor interfacing, data conversion, and power management solutions, collaborating closely with the Delft University of Technology	3
Axiom IC	Netherlands	• A fabless semiconductor company that develops high-performance CMOS mixed-signal integrated circuits	• Expertise in mixed-signal IC design, catering to various applications requiring high-performance solutions	3
Catena Holding	Netherlands	• Provides integrated circuit (IC) architecture and consultancy, circuit design, and contract research services	• Offers comprehensive IC design services, including architecture development and consultancy for various semiconductor applications	3
Ampleon	Netherlands	• A global semiconductor manufacturer and former RF Power business division of NXP Semiconductors, focusing on LDMOS and GaN-SiC technologies	• Develops high-power RF transistors and amplifiers, including LDMOS and GaN-SiC HEMTs, catering to applications like 5G base stations and avionics	3
GreenPeak Technologies	Netherlands	• A fabless company developing semiconductor products and software for the IEEE 802.15.4 and Zigbee wireless market segment, focusing on Smart Home applications	• Specializes in RF silicon communication controller chips for wireless Smart Home applications and the Internet of Things	3

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (1/3)

Company	HQ	Profile	Capabilities	Sub-categories
ASML	Netherlands	• The world's leading supplier for the semiconductor industry specialized in development and manufacturing of photolithography machines • The company was founded in 1984 in Veldhoven as a division spin-off of Philips	• ASML designs and manufactures mechatronic modules like wafer stages, reticle handlers, and optical systems with extreme precision • The company is integrating a myriad of ultra-complex subassemblies (i.e. from Zeiss and Trumpf) into one of the most complex devices in the semiconductor industry – their lithography machines	2,4,5
NTS Group	Netherlands	▪ NTS Group entails multiple divisions (NTS Mechatronics, Optel, Finish and Norma) that engage in different aspects of mechatronic modules and precision assemblies ▪ The company was established in 1986 and is located in Nijmegen	• NTS Mechatronics - the design, engineering, and production of complex mechatronic systems and modules • NTS Optel - applied optics and opto-mechatronic solutions • NTS Finish - high-end precision parts finishing and cleaning • NTS Norma - ultra-precision machining and component production	4,5
Aalberts	Netherlands	▪ The “Aalberst Advanced Mechatronics” division is focusing on delivering tailor-made technologies to their manufacturing clients ▪ The company was established in 1985 and is headquartered in Eindhoven	• The given subdivision specialized in vibration isolation, ultra-precision frames as well as high-purity fluid and gas systems for the semiconductor industry • The division also aids their high-tech customers to address their technology roadmap and manufacturing challenges from concept design to series production through the expertise that they offer	4,5
MTA Group	Netherlands	• A supplier company specialized in in the development, industrialization and cleanroom production of custom mechatronic systems • The company was established in 2002 and is headquartered in Helmond	• MTA Group specializes in custom mechatronic systems, namely their design and development, offering turnkey solutions that integrate mechanical, electrical and control components • The company is also performing high-end precision assemblies under cleanroom conditions	4,5
KeyTec Netherlands	Netherlands	• A company acting as a contract manufacturing specialized in high-precision assemblies and modular mechatronic solutions for OEMs • The company was formed in Eindhoven as a spin-off of Philips in 1999	• KeyTec specializes in the assembly of fine mechanical and electromechanical components in cleanroom conditions in order to provide final deliveries for medical and industrial sectors amongst others • They also provide custom mechatronic subassemblies, including integration of plastics, metal parts, PCBs, sensors, and actuators, integrating them into complete modules that are ready for system-level integration	5

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (2/3)

Company	HQ	Profile	Capabilities	Sub-categories
Prodrive Technologies	Netherlands	• A leading company specialized in end-to-end design and manufacturing solutions for high-tech electronics, software and mechatronics The company was formed in 1993 as a spin-off of TU/E's Department of Electrical Engineering	• Prodrive is specialized in providing high-quality and cost-efficient assembly of standard and complex systems for high-tech OEMs, with the semiconductor and the medical industry being one of their prime clients • The company also performs high-precision mechanical and electromechanical assemblies in their certified cleanrooms	4,5
Demcon Group	Netherlands	• A reputable developer and manufacturer of various technology and innovation products for multiple markets • The company was established in 1993 and is headquartered in Enschede with 9 locations across the Netherlands and Germany	• "Demcon production", a subdivision of the Demcon group, specialized in the development and production of complex mechatronic systems and precision instruments, often offering turnkey solutions • Through the same division, the company also offers cleanroom assembly services for high-tech products for the semiconductor and the medical industry for instance	4,5
Advanced Automated Equipment (AAE)	Netherlands	• An advanced high-tech engineering firm specializing in precision manufacturing solutions for various industries • The company was founded in 1976 and is headquartered in Helmond	• AAE focuses on engineering and building high-tech printing and assembly automation solutions, either combined in one machine or as stand-alone systems. • The company has a business line called "Ultra-Conditioned Precision Modules" through which the company focuses on the development and manufacture of products requiring high precision, including the semiconductor industry	4,5
Hittech Group	Netherlands	• A key system supplier for high-tech markets, focused on ultra-clean precision assembly • The company was established in 2004 with its headquarters in The Hague	• Hittech Group engages in combining electronics, control systems and precision engineering to create and deliver sophisticated mechatronic modules and systems for high-tech OEMs. • The company performs the given high-precision assembly activities in certified cleanrooms	4,5
Salland Engineering	Netherlands	• A test technology and engineering company specialized in solutions and services that enable semiconductor manufacturers to improve their testing activities • The company was founded in 1992 and is headquartered in Zwolle	• Salland Engineering designs and builds custom test and measurement equipment for high-precision semiconductor testing by combining mechatronic systems with different hardware and software solutions • The company also develops and assembles probe and load boards, as well as high-density interconnects and mechanical fixtures for the testing purposes of the semiconductor industry	4

Assessment per segment

#	Specialist Field	Sub-Category
4	Mechatronic Systems and Precision Automation	Mechatronic modules
5		Precision assemblies
6		Automation modules

Mechatronic systems and precision automation (3/3)

Company	HQ	Profile	Capabilities	Sub-categories
NTS Group	Netherlands	• NTS is a technology-driven engineering company providing high-tech manufacturing and system integration for semiconductor equipment, including EFEM solutions • They work closely with semiconductor OEMs to design, build, and assemble complex automation systems	• Design and assembly of EFEM systems • Precision mechatronics and automation engineering • Wafer handling modules and robotic automation • Prototyping and testing services for semiconductor tools	6
Beneq	Netherlands /Finland	• Beneq specializes in atomic layer deposition (ALD) equipment and thin-film coating technology for semiconductors • Their systems incorporate EFEMs for wafer handling and loading/unloading automation in cleanroom environments	• EFEM and wafer handling modules integrated with ALD tools • Automation for advanced coating and thin-film manufacturing • Cleanroom automation and equipment interfaces	6
Micronit Microtechnologies	Netherlands	• Micronit specializes in microfluidic systems and precision microfabrication, offering wafer handling solutions that integrate with semiconductor and advanced manufacturing tools, including EFEM component	• Wafer-level automation and handling for microfabrication tools • Custom EFEM solutions for microfluidic device manufacturing • Precision automation and integration services	6
ASM International	Netherlands	• ASM International is a global supplier of wafer processing equipment for the semiconductor industry • Their portfolio includes EFEM modules used to automate wafer loading and handling in deposition and etching systems	• EFEM modules as part of wafer processing equipment • Automation for ALD, CVD, and epitaxy tools • Precision wafer handling robotics and control systems	6
Philips Engineering Solutions	Netherlands	• **P**hilips Engineering Solutions focuses on providing engineering and automation solutions, including those for semiconductor manufacturing environments • They provide custom automation, including EFEM-related systems, for advanced manufacturing lines	• Custom EFEM system design and automation integration • Robotics and precision handling solutions • Cleanroom automation and control systems	6

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
ASML	Netherlands	▪ ASML is the world's leading provider of lithography systems for the semiconductor industry. Their machines are critical for manufacturing advanced microchips	• Design, manufacturing, and service of complex lithography machines with extreme precision. This includes advanced optics, mechatronics, and software control systems **Future strategy** • Focus on continuous innovation in lithography technology (including EUV and High-NA EUV), expanding their installed base, and supporting the roadmaps of major semiconductor manufacturers	7
NXP Semiconductors	Netherlands	▪ NXP is a major global semiconductor company providing a wide range of solutions for automotive, industrial & IoT, mobile, and communication infrastructure markets	• Design and manufacturing of mixed-signal and standard product devices • Their capabilities include high-precision manufacturing processes and quality control to meet stringent industry requirements **Future strategy** • Focus on key growth markets like automotive (electrification, ADAS), industrial IoT, and secure connected devices. They emphasize innovation in these areas and strategic partnerships	7
Andra Tech Group	Netherlands	▪ Andra Tech Group comprises independent companies specializing in complex, high-volume, and high-precision mechanical components and assemblies	• Precision machining (CNC turning, milling, grinding), sheet metal processing, surface treatments, assembly, and supply chain management • They cater to various sectors requiring high accuracy **Future strategy** • Likely focused on strengthening their position as a key supplier of precision components through technological advancements in their manufacturing processes, expanding their customer base in existing and new markets, and potentially through strategic acquisitions	7

Assessment per segment

#	Specialist Field	Sub-Category
7	Precision Mechanical Systems	High-precision mechanics

Precision mechanical systems (2/2)

Company	HQ	Profile	Capabilities	Sub-categories
Hittech Group	Netherlands	• Hittech Group serves industries such as medical, semiconductor manufacturing, measurement and analysis, and packaging. They are known for their expertise in high-precision mechanics and complex assemblies	• Ultra-precision machining, cleanroom assembly, surface treatments, vacuum technology, and project management for complex mechatronic systems **Future strategy** • Likely centered around expanding their presence in the high-tech industries they serve, investing in advanced manufacturing technologies, and offering integrated solutions that combine their various capabilities	7
Holland Mechanics	Netherlands	• Holland Mechanics specializes in the design and manufacturing of high-precision machines for bicycle wheel production and bicycle assembly	• Design and production of automated wheel truing machines, wheel building machines, and complete bicycle assembly lines, requiring high precision and reliability **Future strategy** • Focus on expanding their global reach in the bicycle manufacturing industry, developing more advanced and automated solutions, and potentially exploring applications of their precision automation technology in other sectors	7

Assessment per segment

#	Specialist Field	Sub-Category
8	Surface treatments	Surface treatments

Surface treatments

Company	HQ	Profile	Capabilities	Sub-categories
Aalberts Surface Technologies	Netherlands	▪ Aalberts Surface Technologies is a leading global provider of surface treatment and heat treatment services, catering to a wide range of industries including aerospace, automotive, medical, semiconductor, and general manufacturing	• Offers a broad spectrum of surface treatments including: • Heat Treatments: Vacuum hardening, nitriding, nitrocarburizing, brazing (including vacuum and hydrogen brazing), annealing, stress relieving • Thin Layer Processes: Physical Vapor Deposition (PVD) coatings (e.g., TiN), Chemical Vapor Deposition (CVD) coatings (e.g., TiN, TiC, CrC, Si), specialized coatings like Stainihard for stainless steel hardening. • Other Surface Technologies: Hot Isostatic Pressing (HIP), brazing, additive manufacturing (in some locations/divisions), cryogenics treatments, cleaning, helium and overpressure leak testing **Future strategy** • Focuses on being a strategic partner for industries requiring advanced material properties and increased longevity of components	8
Glasbeek BV	Netherlands	▪ Specializes in the development, production, and sale of semi-finished and finished products for the industrial surface treatment industry. They are a supplier of surface treatment equipment rather than a service provider applying the treatments	• Design and manufacturing of pretreatment systems, powder coating equipment, wet painting equipment, ovens and conveyer systems **Future strategy** • Developing more sustainable and reliable surface treatment equipment • Providing high-performance and innovative solutions for industrial coating processes	8
Surface Technology Services (STS) Group	Netherlands	▪ STS Group comprises several companies (FST, EPC, Accentus Medical) focused on thermal spray coating technologies and services. They aim to make thermal spray processes more accessible through collaboration and knowledge sharing	• Flame Spray Technologies (FST): Manufacturing of thermal spray systems, equipment, and consumables. Provides turn-key thermal spray solutions • Engineered Performance Coatings (EPC): Application of thermal spray coatings for industries like aerospace, oil & gas, and renewable energy. Offers a well-equipped laboratory and engineering support • Accentus Medical: Specializes in coating application services for the medical device market, offering clinically proven surface coating and modification technologies	8
Tantec	Benelux	• Tantec is a global company specializing in surface treatment technologies, particularly plasma treatment, for improving adhesion in various industries like automotive, medical, electronics, and packaging	• Supply of: Plasma treaters (PlasmaTEC-X, BottleTEC, CableTEC, SpotTEC) • Solutions for surface activation and cleaning using plasma technology **Future strategy** • Expanding the application of plasma treatment in advanced manufacturing processes	8
Euro-Techniek	Netherlands	• Euro-Techniek is a broad precision machining company serving various sectors. They often manage surface treatments as part of their component manufacturing services	• While their core is CNC machining, they coordinate and manage various surface treatments such as plating, anodizing, and coating through their network of suppliers	8

Assessment per segment

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Machine conditioning (1/2)

Company	HQ	Profile	Capabilities	Sub-categories
Kendrion	Netherlands	▪ Kendrion develops, manufactures, and markets high-quality electromagnetic and mechatronic systems and components. While not solely focused on machine conditioning, their components are crucial for various aspects of it within advanced manufacturing	• Electromagnetic actuators and brakes for precise motion control, solenoids and valves for fluid and gas control, rotary and linear motors, and customized mechatronic solutions **Future strategy** • Kendrion aims to strengthen its position in key markets like automotive, industrial automation, and medical technology by focusing on innovative and sustainable solutions. This includes developing more energy-efficient and intelligent components	9,12,13,14
VSE	Germany	▪ Specialist in industrial plastics, rubber, and related products ▪ They provide solutions for various industries, including advanced manufacturing, with a focus on sealing, fluid handling, and other critical components ▪ As part of the larger Hubner Group group, they have access to a broad range of expertise	• Supply of a wide range of industrial hoses, fittings, and couplings for fluid and gas transfer • Sealing solutions, including O-rings, gaskets, and custom seals • Technical advice and support for material selection and application **Future strategy** • As part of Hubner Group, their strategy likely involves expanding their product portfolio, enhancing their technical expertise, and providing integrated solutions to meet the evolving needs of the advanced manufacturing sector, with a focus on reliability and safety	9,12,13,14
Festo	Germany	▪ Festo is a global leader in automation technology, providing pneumatic and electric drive technology for factory and process automation. They are a significant player in machine conditioning through their extensive product range	• Pneumatic cylinders, valves, and air preparation units • Electric drives, motors, and controllers • Sensors and control systems • Vacuum technology components (ejectors, suction cups) • Fluid control valves for various media **Future strategy** • Festo's strategy focuses on digitalization, energy efficiency, and intelligent automation solutions. They are investing in technologies that enable more flexible, connected, and sustainable manufacturing processes. This includes expanding their range of smart components and digital services	9,12,13,14
Parker Hannifin	USA	• Parker Hannifin is a global leader in motion and control technologies, providing a wide range of products and systems for industrial and mobile markets • Their offerings are highly relevant to machine conditioning in advanced manufacturing	• Hydraulic and pneumatic cylinders, valves, pumps, and motors • Fluid connectors, hoses, and tubing • Filtration and process control systems • Sealing and shielding solutions • Instrumentation products **Future strategy** • They aim to provide integrated solutions that enhance the efficiency and reliability of industrial machinery	9,12,13,14

Assessment per segment

Machine conditioning (2/2)

#	Specialist Field	Sub-Category
9	Machine conditioning	Gas handling
10		Temperature control
11		Layout products
12		Pneumatic
13		Vacuum
14		Fluid power components
15		Cleaning & verification

Company	HQ	Profile	Capabilities	Sub-categories
SMC Pneumatics	Japan	▪ SMC is a global leader in pneumatic technology, providing a vast array of components and systems for industrial automation ▪ They are a major player in machine conditioning through their specialization in pneumatics	• Pneumatic cylinders, valves, actuators, and air preparation units • Fittings, tubing, and quick connectors for pneumatic systems • Sensors and control systems for pneumatic applications • Electric actuators as a growing part of their portfolio **Future strategy** • SMC's strategy focuses on expanding its global presence, developing innovative and energy-efficient pneumatic solutions, and integrating electronics and controls into their pneumatic offerings • They are also increasingly focusing on providing solutions for specific industries within advanced manufacturing	9,12,13

Assessment per segment

#	Specialist Field	Sub-Category
16	Software	Activities – Services
17		Functions – System software
18		Functions – Software for hardware modules

Software

Company	HQ	Profile	Capabilities	Sub-categories
TOPdesk	Netherlands	• TOPdesk develops and provides service management software	• While not exclusively focused on manufacturing, their ITSM (IT Service Management), ESM (Enterprise Service Management), and facility management solutions are crucial for the efficient operation and maintenance of advanced manufacturing facilities and equipment • Incident management, problem management, change management for IT and OT (Operational Technology) systems • Asset management for tracking and managing machinery, tools, and other assets • Service request management for internal and external services **Future strategy** • TOPdesk aims to expand its market share globally by continuously improving its software offerings, focusing on user experience, and providing solutions that integrate IT and OT environments	16
PTC Nederland	USA	• PTC provides software solutions for product lifecycle management (PLM), computer-aided design (CAD), internet of things (IoT), and augmented reality (AR) technologies, all highly relevant to advanced manufacturing	• Windchill for PLM and product data management • Creo for 3D CAD • ThingWorx for industrial IoT platform and connectivity • Vuforia for augmented reality applications in manufacturing (e.g., remote assistance, work instructions)	16
ATS Global	Netherlands	• ATS Global is an independent solution provider for smart digital transformation. They offer a range of services and software solutions focused on manufacturing execution systems (MES), quality management, and industrial automation	• MES implementation and support • Quality management system (QMS) software and services • Industrial automation software integration • Data analytics and reporting for manufacturing intelligence • Overall Equipment Effectiveness (OEE) monitoring and improvement solutions	16
IXON	Netherlands	• IXON develops and provides an industrial IoT platform specifically designed for machine builders and system integrators • Their solutions enable remote access, data monitoring, and predictive maintenance for industrial equipment	• IXON develops and provides an industrial IoT platform specifically designed for machine builders and system integrators • Their solutions enable remote access, data monitoring, and predictive maintenance for industrial equipment	17,18
Tatem BV	Netherlands	• Tatem specializes in industrial automation software and hardware solutions, particularly in the areas of motion control, robotics, and machine vision • They often develop custom software for specific hardware modules and applications	• Development of custom software for PLC and industrial PC-based control systems • Integration of motion control systems (servo drives, stepper motors) • Implementation of robot control software and interfaces • Development of machine vision software for inspection and quality control • Real-time data acquisition and processing. Development of user interfaces and HMI applications	17,18

Assessment per segment

Additional segment: Atomic layer deposition and layering

Company	HQ	Profile	Capabilities
Oxford Instruments	UK	• Oxford Instruments provides advanced etching and deposition equipment for semiconductor and nanotechnology industries • Their plasma etching tools are used in semiconductor fabrication for precise material removal.	• Plasma etching and dry etching equipment • ALD and PECVD (Plasma Enhanced CVD) systems • Process control and diagnostics solutions • Wafer-level precision etching for advanced nodes
Imec	Belgium	• Imec is a world-renowned nanoelectronics R&D center, heavily involved in ALD and etching research for semiconductor manufacturing at advanced technology nodes • They collaborate with Dutch semiconductor companies and institutions	• Research and prototyping of ALD and etching processes for advanced nodes • Development of new materials and process technologies • Integration of deposition and etching tools in advanced fabs • Process monitor and metrology integration
ASM International *(mentioned previously)*	Netherlands	• ASM International is a global leader in wafer processing equipment for the semiconductor industry • They specialize in Atomic Layer Deposition (ALD) and Chemical Vapor Deposition (CVD) equipment, as well as etching technologies • ASM's advanced systems are widely used in leading-edge semiconductor fabs worldwide.	• ALD and CVD systems for thin-film deposition • Plasma etching and surface treatment equipment • Wafer-level process integration and automation • Equipment R&D for next-generation semiconductor materials
Beneq *(mentioned previously)*	Netherlands/ Finland	• Beneq specializes in ALD and thin-film coating technology for semiconductors and other advanced materials • Their systems are designed for precision, uniform coatings at atomic scale, serving semiconductor fabs and R&D labs globally	• ALD equipment for advanced semiconductor manufacturing • Thin-film coating and surface functionalization • Customized solutions for various substrate sizes and materials • Integration of deposition systems with wafer handling automation

Assessment per segment

Additional segment: Metrology

Company	HQ	Dutch Base	Profile	Key Metrology Capabilities
ASML Holding N.V.	NL	Veldhoven	Global leader in lithography systems; also develops in-line metrology tools for semiconductor fabs.	Overlay & focus metrology, EUV metrology, process control, scanner-integrated metrology
Thermo Fisher Scientific (FEI)	US	Eindhoven	Specializes in electron microscopy and nanoscale imaging for semiconductor metrology and failure analysis.	SEM, TEM, FIB, defect analysis, materials characterization
Bruker Nano Surfaces	USA	Netherlands (regional presence)	Offers high-resolution surface analysis tools for semiconductor R&D and manufacturing.	AFM, XRD, surface roughness, 3D topography, thin-film metrology
Nearfield Instruments B.V.	NL	Rotterdam	Dutch startup offering advanced scanning probe metrology for in-line process control.	High-resolution 3D metrology, atomic-scale inspection, EUV/3D NAND support
TNO (Holst Centre / Van Leeuwenhoek)	NL	Eindhoven, Delft	National research institute with dedicated R&D in metrology for semiconductors and flexible electronics.	Optical/X-ray/electron metrology R&D, thin-film analysis, real-time inline sensors
Imec Netherlands (Holst Centre)	BE	Eindhoven (via Holst Centre)	Collaborative R&D focused on thin-film and flexible electronics metrology with semiconductor relevance.	Thin-film quality control, advanced sensor metrology, materials diagnostics
Malvern Panalytical	UK	Almelo	Specializes in materials characterization for semiconductor and advanced manufacturing sectors.	XRF, XRD, thin-film stress/composition, nanomaterials analysis

Contact Information

Contact information

BCI Global

Johan Beukema
Managing Partner
johan.beukema@bciglobal.com

Luc Kremers
VP Asia Pacific
luc.kremers@bciglobal.com

Franziska Scheuermann
Senior Consultant
franziska.scheuermann@bciglobal.com

Tory McFerson
Consultant
tory.mcferson@bciglobal.com

Embassy of the Kingdom of the Netherlands in Malaysia

Ang Kit Sin
Senior Economic Officer, Semiconductor and High-Tech Industry
kitsin.ang@minbuza.nl

Brabant Development Agency (BOM)

Jelmer Hemmes
Project Manager, International Trade – Asia
jhemmes@bom.nl