

A large, blue-tinted image of a cable-stayed bridge spanning a body of water. The bridge has two tall, dark towers with multiple stay cables. The water is a lighter blue, and the sky is a gradient of blue. The image is partially obscured by a white rectangular box on the right side, which has a red border.

MANUFACTURING BEYOND BORDERS

Your Integrated Manufacturing Partner

A short, horizontal blue line with a slight downward curve at the right end.

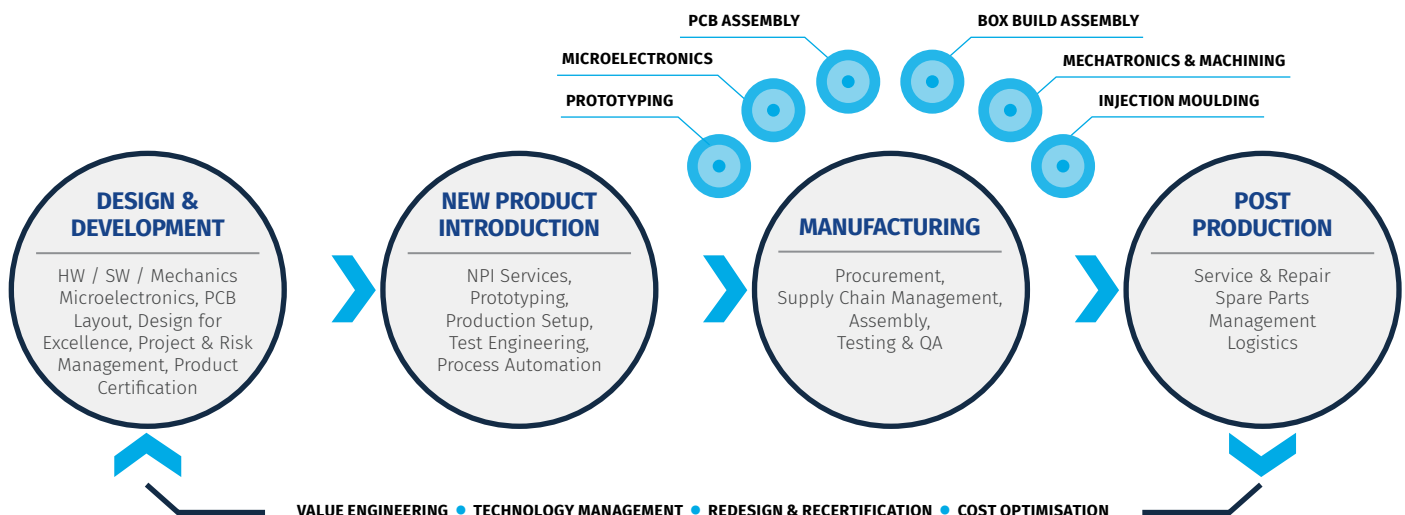
For disruptive Industrial, Medical,
and Transportation OEMs looking to
scale their business by outsourcing
design & manufacturing.

ESCATEC AT A GLANCE

- ✓ Established in 1984
- ✓ Privately owned, family run business
- ✓ Headquartered in Penang, Malaysia
- ✓ 10 production facilities globally
- ✓ 2,000+ employees



Your Integrated Manufacturing Partner





➤ WHY ESCATEC?

- Headquartered in Penang, Malaysia
 - Hub of high-end electronics development and lean manufacturing.
 - Local and international supply chain partners.
 - Zero language barriers (English speaking staff)
- Privately owned, no external financing
- Flat organisational structure leading to quick decisions
- Swiss quality, precision and control with the dynamic energy and capabilities of Asia
- Global manufacturing footprint including NPI and industrialisation hubs in the UK and Europe.
- Dedicated Design & Development innovation hub in Switzerland
- Complete range of design, development, manufacturing, and aftermarket refurbishment solutions.

2

OUR COMPANY

At ESCATEC, we help our customers Innovate, Scale, and Repeat. We make the transition between Design & Development and volume manufacturing seamless. We work closely with world-renowned OEM partners each day to extend the lifetime of their products and support them with the next iteration.

It's a continuous cycle of improvement.

CUSTOMER FOCUS FROM DAY ONE

Ever since ESCATEC first opened in 1984, our focus has been on our customers. Their success is our success. By delivering as we promise, we continuously create trust and build mutually successful long-term relationships.

With this trust, we've grown in expertise, technology, and size to what we are today: a team of 2,000 + employees in Penang and Johor Bahru, Malaysia; in Heerbrugg, Switzerland; Lutterworth, United Kingdom; Chomutov, Czech Republic; and Plovdiv, Bulgaria.

Our customers, many of which are now long-term partners, rely on us to provide world class customer service and zero-defect products so they can concentrate on what they do best – staying one step ahead in a fast-paced world.

“WE’RE HAPPY TO HAVE FOUND SUCH A HIGHLY PROFESSIONAL PRODUCTION PARTNER IN ESCATEC”.

**Chief Executive Officer,
Medical Sector**



CORE VALUES

Our values define who we are and how we operate. They set our standards, are integrated into all our business processes and are the key to mutual success with our customers.



CUSTOMER SATISFACTION

We recognize our customers' ever-changing requirements and respond to them quickly. We consistently deliver the best possible service, expertise, quality, lead times, and cost efficiency.



COMMITTED PERSONNEL

Initiative, sharing of ideas, empowerment, accountability, and responsibility form the basis for the entrepreneurial spirit that is valued at ESCATEC.



ETHICAL CONDUCT OF BUSINESS

We conduct our business with uncompromising integrity, providing a safe, clean, and ethical workplace, taking care of the environment under our influence and contributing to our community.



CONTINUOUS IMPROVEMENT

We invest in developing our personnel and are committed to continuously implementing improved methods and systems.

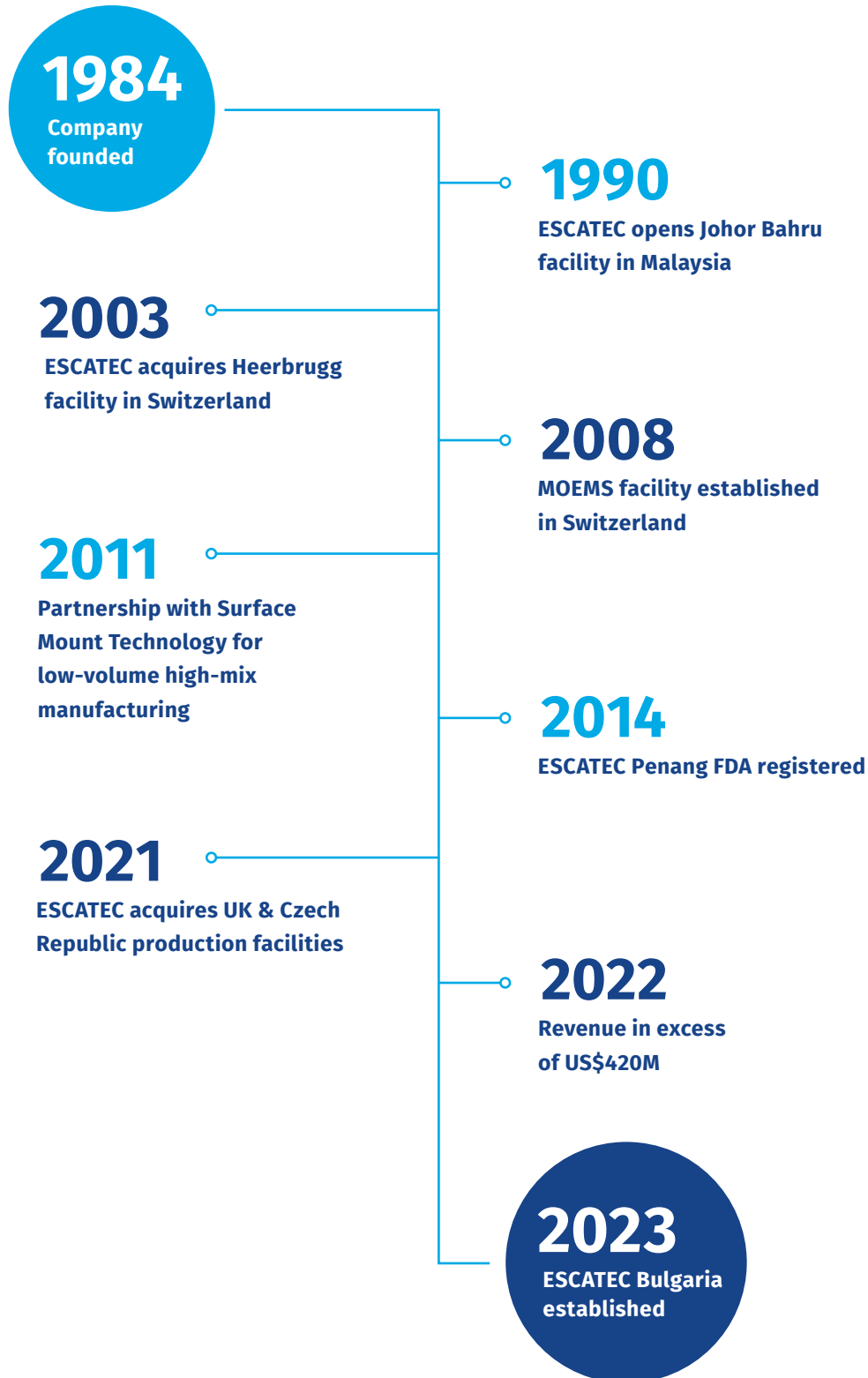


RESULTS ORIENTATED

We are committed to our goals of managed revenue growth and consistent profitability of the Group through prudent and successful business practices.



MILESTONES



INDUSTRY LEADING REGULATORY AND COMPLIANCE

Excellent quality is essential to what we do and the basis for our customers' trust. The quality we deliver complies to standards and regulations recognised all over the world.

We make no compromises and continuously challenge ourselves to improve, ensuring we all do our part to reach the goal of zero defects. Our customers grow and prosper through our dedication to highly ethical and sustainable business practices. Our core values protect customer brands and their reputations.



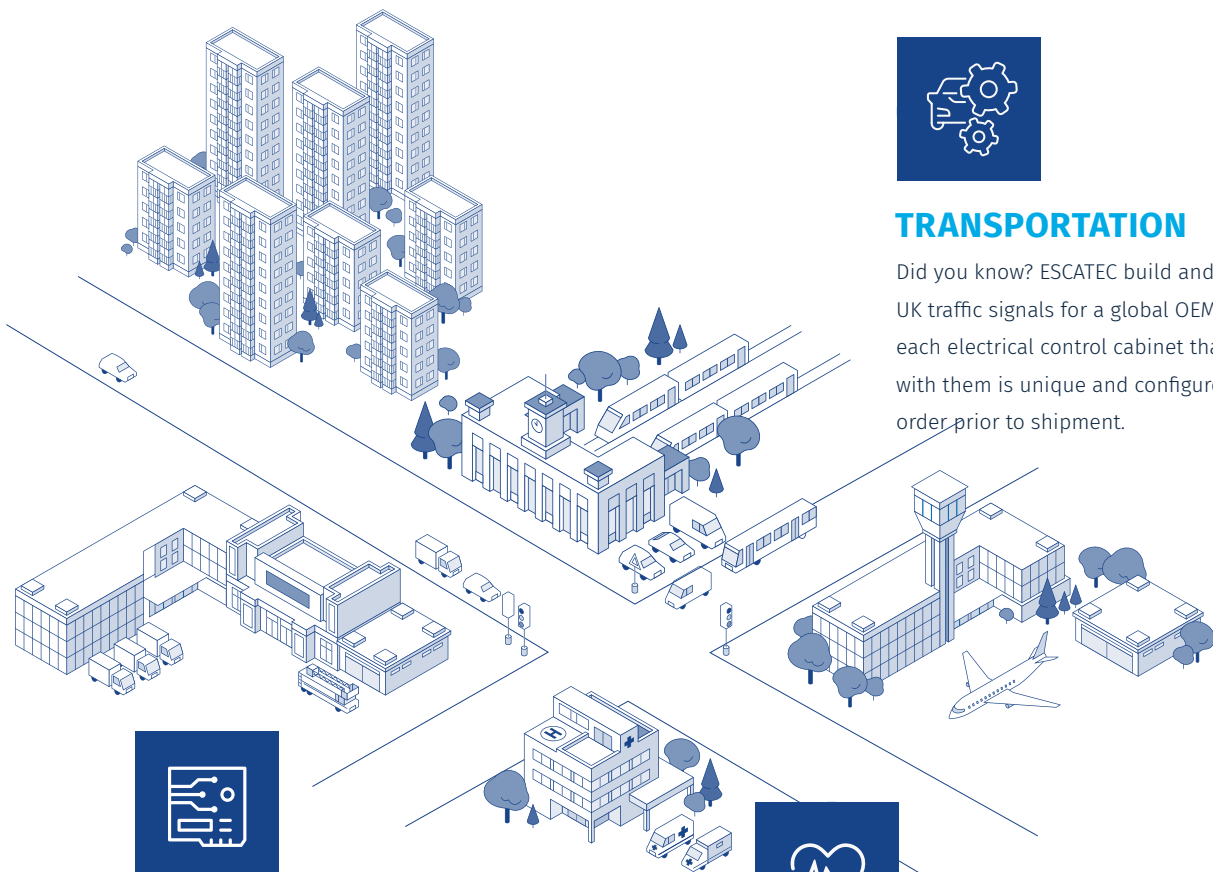
“OUR COMMITMENT TO COMPLIANCE AND GOVERNANCE NOT ONLY MINIMISES RISKS BUT ALSO GIVES ESCATEC CUSTOMERS THE ASSURANCE THAT THEIR BRANDS ARE SAFE WITH US.”

Haidar Othman Muhammad –
Section Head – Corporate Compliance

MARKET SECTORS

ESCATEC partners with major OEM brands across a wide range of market segments. We have helped OEMs in a variety of sectors such as Industrial, Medical & Transportation.

“Our contributions in these sectors and more are visible in your life, whether you see them or not!”



TRANSPORTATION

Did you know? ESCATEC build and deliver UK traffic signals for a global OEM and each electrical control cabinet that ships with them is unique and configured-to-order prior to shipment.



INDUSTRIAL

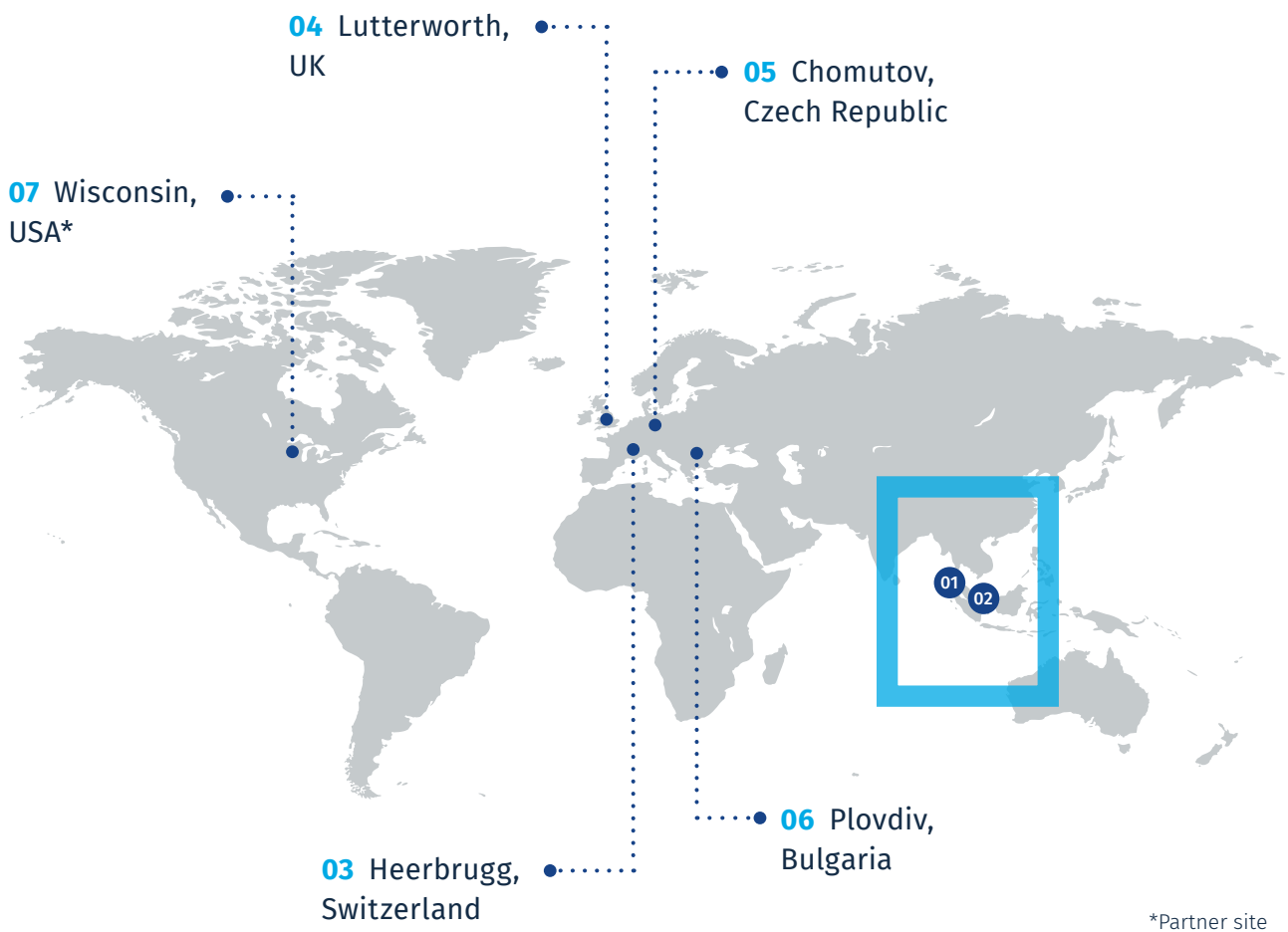
Did you know? ESCATEC build over 3 million gas and water meters each year on behalf of several leading flow measurement OEM's. And each ecommerce mechatronic platform we assemble for a global player consists of over 18,000 individual parts!



MEDICAL

Did you know? ESCATEC played a pivotal role during the COVID-'19 pandemic by manufacturing an innovative cold chain monitoring device which helped to safely deliver over 5 billion Pfizer vaccinations in under two years.

THINK GLOBAL BUILD LOCAL



01 Penang Campus

- 2 manufacturing facilities in Penang, Malaysia.
- Located within the Bayan Lepas Industrial Zone
- Vertically integrated: Electronics, Plastics and Assembly
- Footprint: 24,425 m²
- Logistics:
 - 25 minutes from Penang Port
 - 8 Minutes from the Penang International Airport

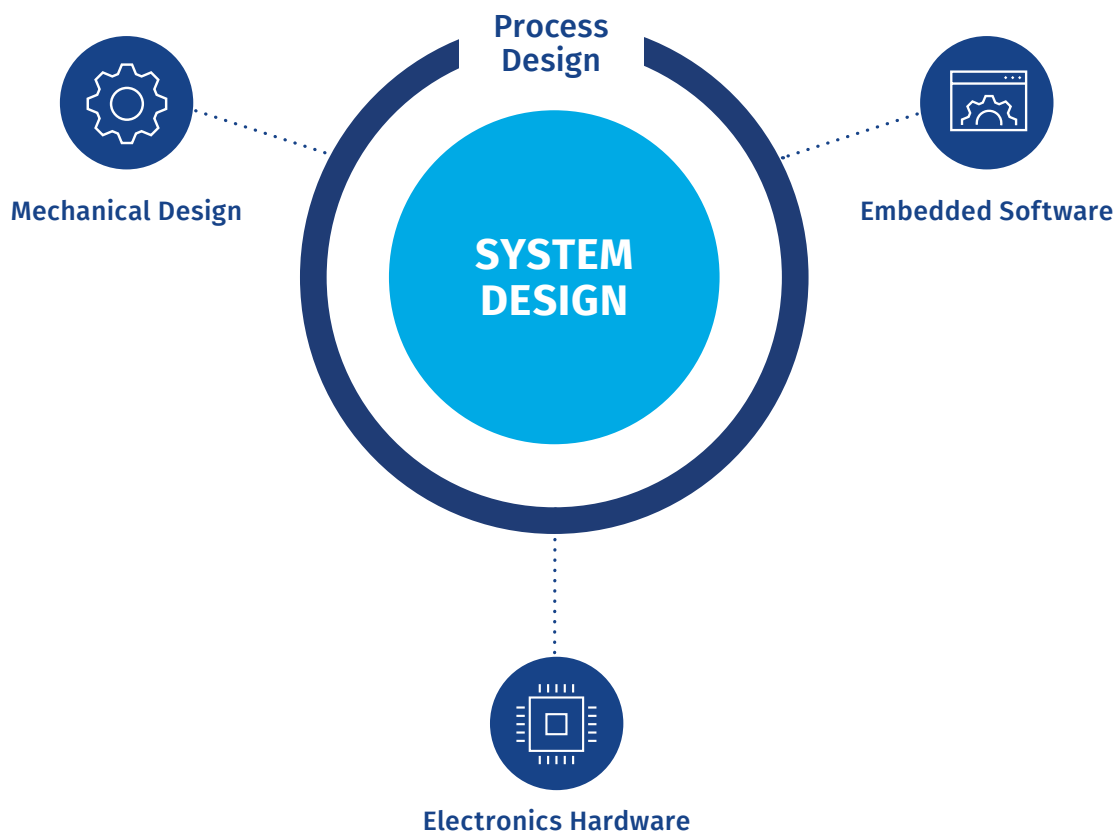
02 Johor Bahru Campus

- 2 manufacturing facilities in Johor Bahru, Malaysia.
- Vertically integrated: Electronics, Plastics and Assembly
- Footprint: 16,890 m²
- Logistics:
 - 48min from Singapore Port
 - 45min from Singapore Changi Airport
 - 25 minutes from Johor Bahru Senai International Airport
 - 25min from Pasir Gudang Port and PTP, Malaysia

DESIGN & DEVELOPMENT CAPABILITIES

A successful product requires a well-thought-out design. ESCATEC takes your idea and transforms it into a fully certified product, ready to manufacture at the lowest cost of ownership.

Working closely with you, our engineers help define the architecture of your product to satisfy your specific requirements. What sets ESCATEC apart from a traditional design house is the strong focus we apply to design for manufacturability during the product development phase. This approach eliminates waste, reduces cost, and helps ensure your products are delivered to market in the shortest possible time.





System Design

- Requirements engineering
- Feasibility study
- System architecture
- Product specification
- System verification
- Risk management
- Certification



Mechanical Design

- 3D mechanical design (solid edge)
- Material evaluation & selection
- DFM/DFA, FEM simulations
- Environmental testing
- Fast prototyping (in-house 3D printing)
- Collaboration with industrial designers
- Management of toolmakers



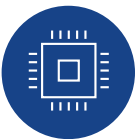
Embedded Software

- Software architecture
- Embedded SW (C, C++)
- Application SW (Linux, Java, Python)
- Implementation of MMI & GUI
- Board support packages (BSP)
- Built-in system test (BIST)
- Continuous improvement (updates)



Process Design

- Evaluation of internal/external manufacturing processes
- Value stream mapping
- Conceptual design of complete manufacturing process
- Design of manufacturing jigs & fixtures
- Development of encapsulation processes
- Collaboration with production machinery suppliers
- Design verification by PFMEA



Electronics Hardware

- Schematics design
- Key component evaluation
- Miniaturisation & packaging
- COB, LIDAR, TOF processing
- PCB technology evaluation
- PCB & layout design
- Fast prototyping (in-house PCB assy)

DFX SERVICES

Design for Excellence

Integrated as part of a product development or as single work package.

Design for..



QUALITY

- Follow qualified Development Process
- Product Design and Process FMEA
- Design Reviews
- Consider Design Guidelines



ENVIRONMENT

- Follow Eco Design Rules
- RoHS & REACH
- WEEE, ISO 14001
- Compliance Management
- Smart Powering Concepts
- Increase recyclability



COST

- Target Costing
- Total Supplier Management
- Component Lifecycle Management
- SiEx Tool
- Optimize process to reduce costs



TEST

- Improve usability
- Test time reduction with automation
- System Level Test
- Board Level Test
- Built-In Self-Test
- Flying Probe Test
- Automated Optical Test
- Boundary Scan

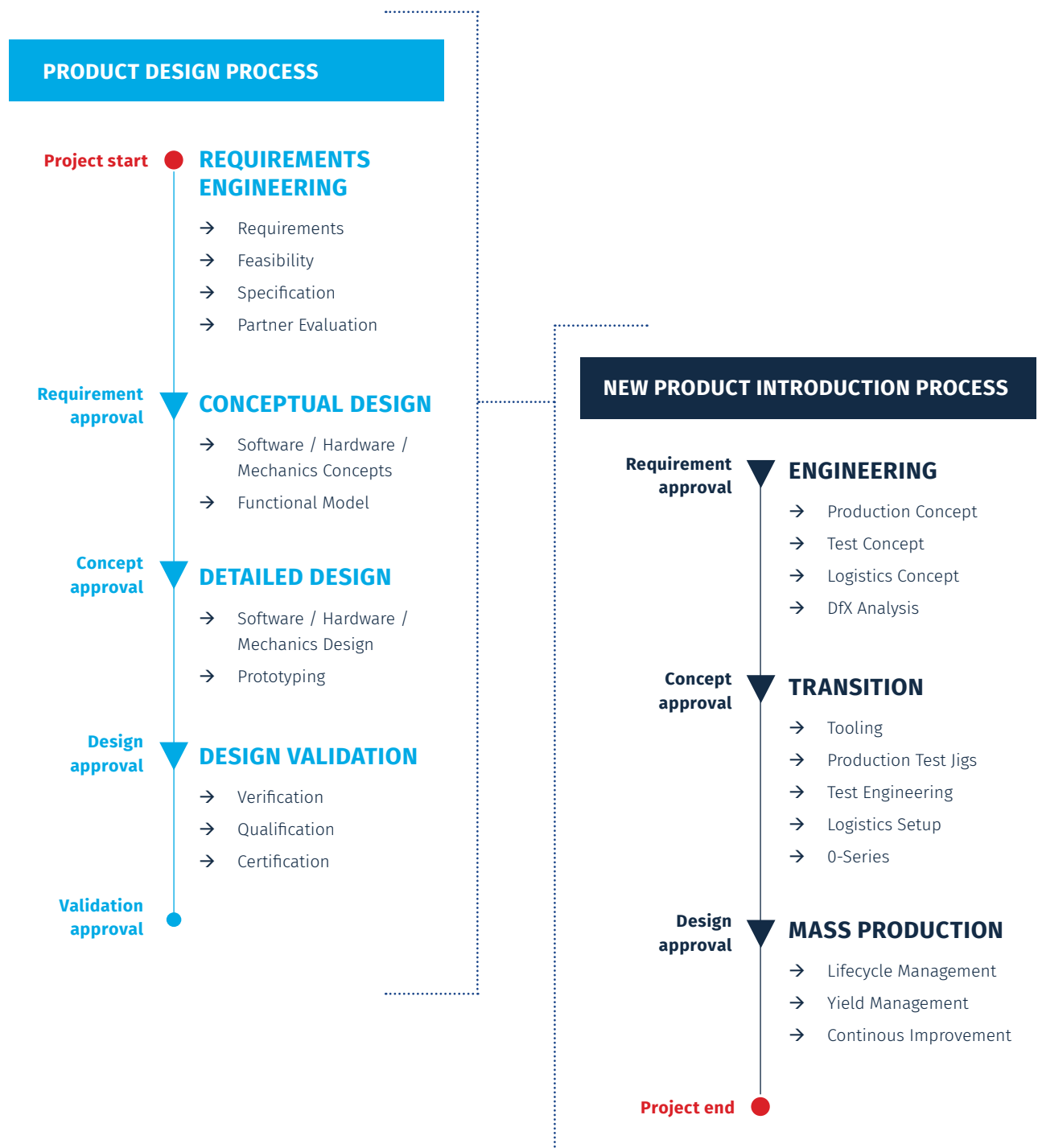


MANUFACTURING

- Simplify assembly by redesigning the product
- Process and production line optimizations with LEAN approach
- Valor Process Preparation Module
- Consider Design Guidelines

OUR D&D APPROACH

Developing products with highest manufacturability awareness to ensure efficient industrialization



CASE STUDIES

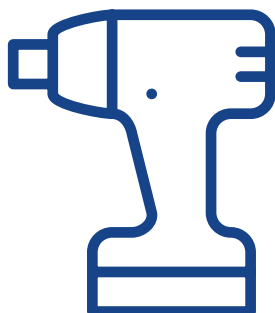


SMART WORKSPACE MANAGEMENT

- Rapid prototyping: < 4 weeks
- Monitoring office usage with an IR Camera
- 80x80 IR sensor and ambient light sensor
- Co-Processor: Cortex-M0
- Main Computer: Raspberry Pi CM3+ (Cortex-A53 (ARMv8) 64-bit SoC @ 1.2GHz) to process the IR and sensor data
- Send messages over LAN (MQTT protocol)
- Powered over PoE

BONE DRILLING MACHINE

- Sensorless BLDC motor control using different technologies (block commutation, field-oriented control)
- Hall effect sensor for detecting button movement through the housing
- Custom battery pack, 100W continuous



RESPIRATORY DEVICE

- Triple Processor (Panel PC: i.MX8 quad core, ECU: STM32F7, EMU: STM32G4)
- Fully developed USB-C Interface including Display Port, USB PD up to 100W, USB 2.0 Interface
- O2 & Air mixing
- Custom Linux for 15" panel
- 2 HF Jets, Bias Flow, Humidification of Air
- System modelling and real time calculation of flows, temperatures, pressures

YOUR INTEGRATED MANUFACTURING PARTNER

- Project Management
- Feasibility Study
- Requirements Specification
- Design and Implementation of:
 - Electronics Hardware
 - Mechanics
 - Firmware
- Rapid prototyping
- Approval Testing
- Industrialisation

WHAT OUR CLIENTS SAY

“ As the number one global tea manufacturer, **finding the right partner for industrialization and manufacturing was key** for our move into in-home capsule-based tea machines. ESCATEC’s expertise in electronics, dedication to quality and one team approach made them a perfect partner for this revolutionary move.

Executive Vice President - Consumer sector

“ We spoke to a lot of partners, advisors, and similar companies. But it became clear that only ESCATEC had the facilities and staff to match all our future needs. **ESCATEC could help us in sourcing large quantities of components, which we needed to grow and scale** in the near future. But they also had the skills to help us continually modify and improve the product to meet the latest, global med tech standards.

Chief Executive Officer - Medical sector

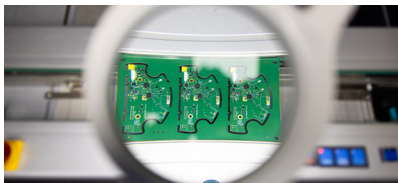
“ **ESCATEC’s global approach meant a smooth transfer from low volume into high volume manufacturing.** Setting up mass production lines is complex at the best of times, but ESCATEC ensured any problems were proactively discovered and jointly overcome in an efficient manner. This was enabled by transparent communication and solution-oriented mindset of ESCATEC employees around the world, working together.

Chief Executive Officer - Industrial sector

MANUFACTURING CAPABILITIES

When you partner with ESCATEC you benefit from a complete range of end-to-end manufacturing capabilities.

In addition to PCBA and Box Build services which are offered by most EMS providers, ESCATEC has invested heavily in dedicated Design & Development, Microelectronics, Mechatronics and Plastic Injection Moulding facilities. This continued investment, combined with a global footprint, offers OEMs significant value, and enables them to outsource their entire product portfolio to a single supplier.



PROTOTYPING

- Design integration
- Informed decision making
- Automation and digitization
- User feedback



MICROELECTRONICS

- ISO Class 7 Cleanroom
- Die & wire bonding
- Precision encapsulation
- Optical alignment



PCB ASSEMBLY

- SMT, BGA, PoP, COB, THT
- Structural and functional tests
- Automated conformal coating and bonding
- IPC Class III



BOX BUILD ASSEMBLY

- Benchtop systems
- Custom enclosures
- 19" rack assembly
- Display solutions



MECHATRONICS & MACHINING

- Electro-mechanical assembly
- Panel wiring and cabinet assembly
- Machining and fabrication services
- Test solutions



INJECTION MOULDING

- 15-460 tonne presses
- Integrated robotics and automation
- Secondary processes
- Process monitoring for precision and repeatability

FACTORY TRANSFERS

Closing an entire factory, taking one over, or transferring large volumes of production to another country can be daunting for OEMs. ESCATEC has a proven track record of supporting numerous clients around the world achieve their outsourcing objectives, including:



USA TO JOHOR BAHRU

High volume
production transfer



DENMARK TO PENANG

Complete factory
transfer (original
factory closure)



FINLAND TO PENANG

Production and
logistics transfer



DENMARK TO PENANG

High volume
production transfer



FRANCE TO CZECH REPUBLIC

Production and
logistics transfer



UK TO UK

Complete factory
transfer (original
factory closure)

FACTORY TRANSFER SOLUTIONS

Why Consider a Transfer?

- Manufacturing no longer core business
- Manufacturing cost too high
- Investment cost too much
- Technology advancement
- Capacity increases
- Labour shortage
- Risk management

OWN RELOCATION

ADVANTAGE FOR CUSTOMER

- Full management control
- Dedicated facility

DISADVANTAGE FOR CUSTOMER

- New region/culture
- Start-up risk
- Heavy on human capacity
- Heavy on investment
- Synergy effect missing (Economy)

TRANSFER TO ESCATEC

ADVANTAGE FOR CUSTOMER

- Lowest manufacturing cost (shared overhead cost with other customers)
- Lowest investment cost (Tooling only)
- Access to ESCATEC know-how & technology
- Higher flexibility
- Less management involvement and cost

DISADVANTAGE FOR CUSTOMER

- None

It is all about fit.

When choosing an EMS partner, it is important they are the right size for your business and you both speak the same language.

OUR FACTORY TRANSFER PROCESS

Project Planning

- ✓ Dedicated or existing facility
- ✓ Risk analysis and management
- ✓ Supply chain transfer and management
- ✓ Analysis of cost / benefit of equipment transfer or replacement
- ✓ Buffer stock production plan to ensure continuity

Resource
and capacity
analysis



Location
analysis



Project
Planning



Preparation



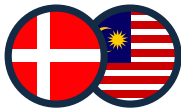
Transition



Full
production



FACTORY TRANSFER CASE STUDY



DENMARK TO PENANG

Complete factory transfer (original factory closure)

PHASE 1 – 45 PCBA TRANSFER

8 MONTHS DURATION

- Full NPI of all 45 PCBAs
 - 30 flying probe
 - 15 ICT
 - 45 FCT
- SMT & Wave solder equipment transfer
- Recycle and renovate jigs and fixtures

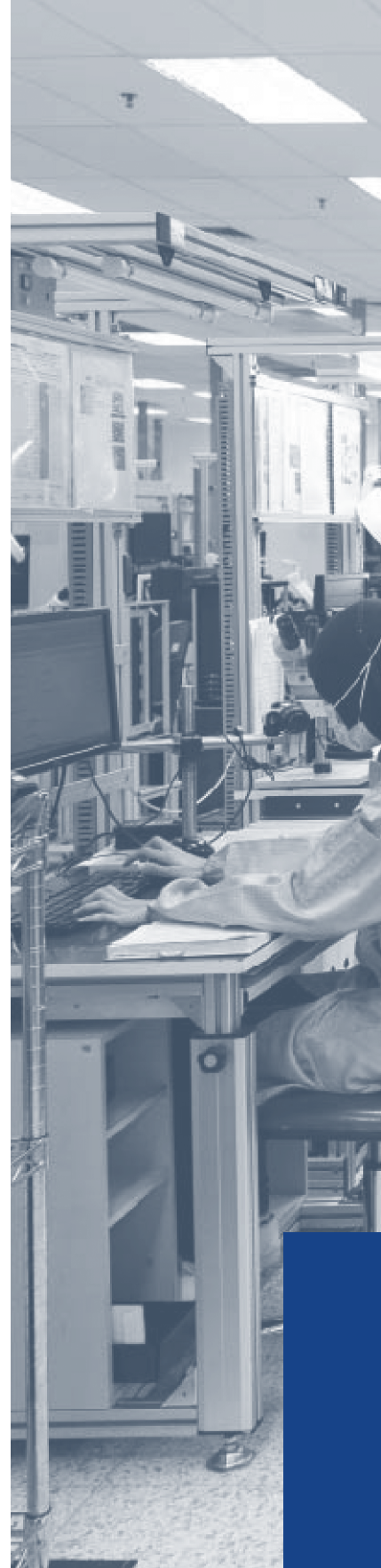
PHASE 2 – BOX BUILD TRANSFER

9 MONTHS DURATION

- 9 families of Box Builds
 - 9 FCT
 - 9 Hi-pot testers
 - 30 plastic mold tools
- Localised material sourcing from EU to Malaysia

PRODUCTION

- **Volume:** 100k pcs/yr
- **Efficiencies:** 176% increase in daily output





YOUR INTEGRATED MANUFACTURING PARTNER

- Material procurement and supply chain management
- Equipment transfer, jig and fixture creation
- New Product Introduction process
- SMT and THT PCB assembly
- Flying probe, in-circuit, hipot, and functional test
- Box build assembly
- Wiring assembly
- Plastic injection moulding

SUSTAINABILITY, BUILT IN

ENVIRONMENTAL

ESCATEC is committed to ensuring that our business activities and services adhere to ISO 14001 environmental rules and country-specific governmental regulations. Our main goal is to conduct business in a way that is in harmony with and protects the environment.

Our key objectives are to:

- Ensure compliance with legal and other statutory requirements such as environmental quality legislation, regulations, and global environmental requirements to prevent environmental pollution.
- Commit to continuous improvement to prevent depleting natural resources, reduce energy consumption, and control waste products
- Identify environmental risks to prevent pollution
- Promote the 3Rs of natural resources: Reduce, Reuse, and Recycle
- Train and support our staff to ensure we meet environmental objectives and targets
- Work with suppliers and subcontractors to ensure they are environmentally responsible
- Support environmental protection of air, water, land, and natural resources.



ESCATEC Global Net Zero Carbon





Our energy-saving efforts have yielded positive results. All our facilities actively try to reduce energy consumption, and we encourage our employees to use resources carefully. We have invested in energy-efficient lighting and air conditioning; for example, **our Penang facilities have reduced electric consumption by 30%** in terms of KWH per sale. In addition, in 2022, we began investigating a range of renewable energy solutions including the use of solar panels for our Malaysian factories. **Our aim is to reduce emissions by 50% by 2030** and this is the first of many projects planned for the rest of our group.

SOCIAL

ESCATEC is proud to have an inclusive culture where people feel comfortable being themselves and everyone has the chance to succeed, regardless of who they are.

Our global workforce spanning three continents, comprises employees from different races, cultures, religions, experiences, genders, and generations. ESCATEC is proud to have this mix, and we know that our diverse workforce strengthens our business as everyone has a unique blend of talent and insight.

Globally, we greatly appreciate our employees and host numerous social events annually to remind them they are part of our success.

Throughout the world, our businesses are also inextricably linked to the local communities in which they operate. Close relationships with local communities mean we can all thrive, which is why we promote social projects that positively impact local communities.

GOVERNANCE

Today's world continues to present highly complex challenges with partners and services interconnected globally. The importance of corporate governance and fostering a thriving company culture continues to grow daily.

ESCATEC is committed to good corporate governance. It sets our long-term strategy and ensures lasting value and success for our customers and partners.

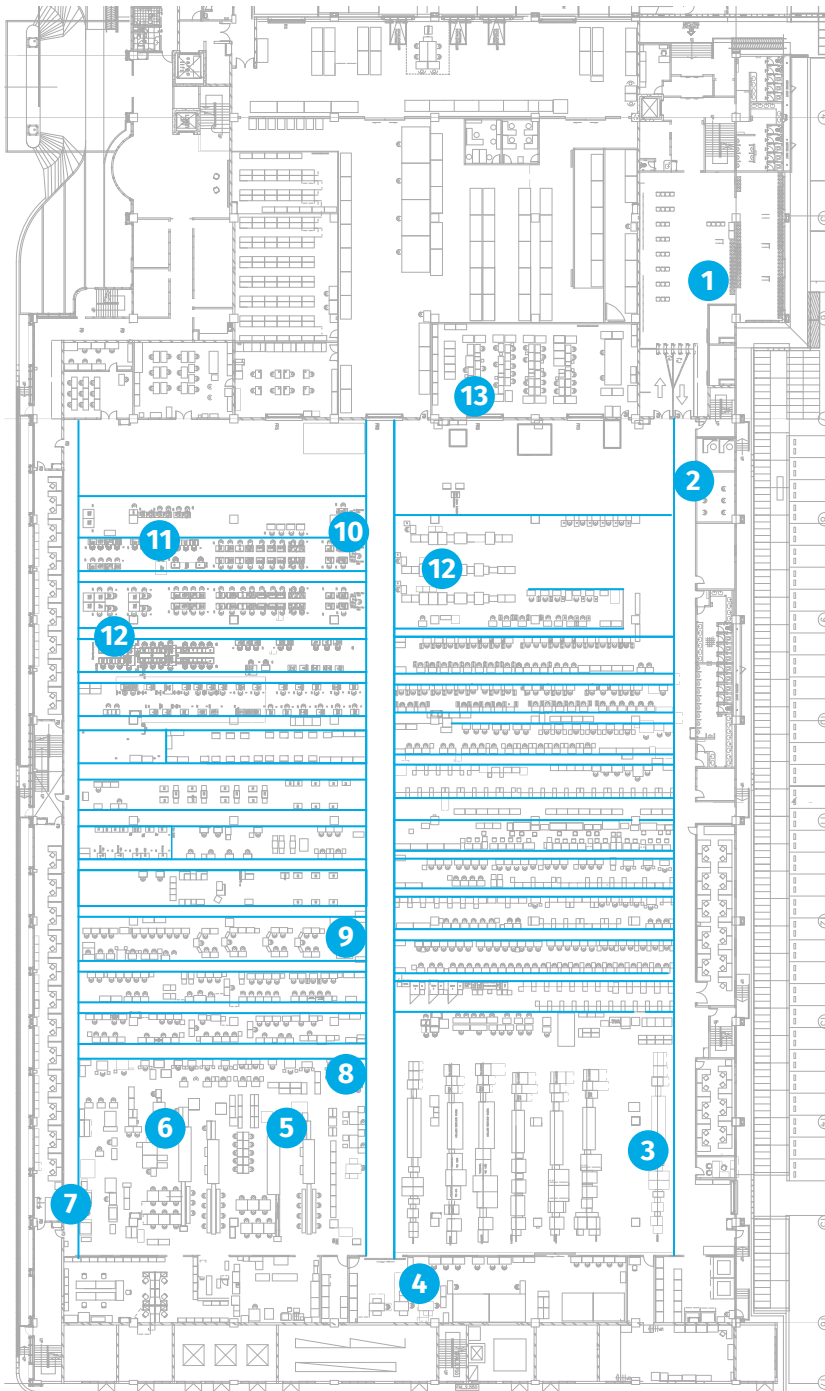
These policies help us align business operations and values between our company, partners, and customers. They create an environment of trust, transparency, and integrity for sustainable mutual growth.

Ethically conducting business is one of ESCATEC's five core values. We operate our business with uncompromising integrity. The highest possible standards of ethical and business conduct are required and expected from all our employees.



FACTORY TOUR

GROUND FLOOR

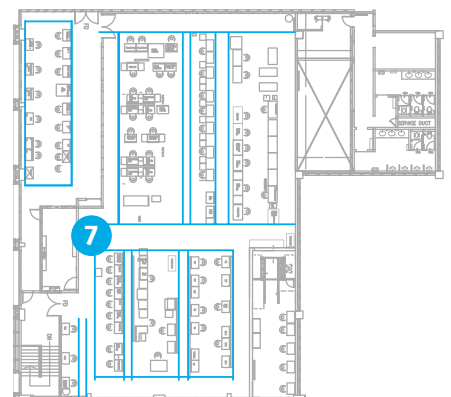


01. Chua Jin Jeong
General Manager

I AM THE GENERAL
MANAGER OF ESCATEC
ELECTRONICS AND
ESCATEC MEDICAL
HERE IN PENANG.

I am very pleased you were able to visit us, and I hope the tour of our main plant and plastic moulding production facility was interesting for you. Here are the team members you met and a quick reminder of what they covered during the tour.

TOP FLOOR





02. SUHAILA Mustapha Kamal

Training Manager

Hi, I am Suhaila, the Training Manager here in Penang. I explained the training initiatives and courses we offer all employees and showed you our in-house Digital Learning Centre.



03. Jimmy WEE

SMT Section Head

Hi, I am Jimmy, SMT Section Head. In total, we have 7 SMT lines and I walked you through our machine capability process of Line 7.



04. Luke TEO

SMT Engineer

Hello, I am Luke, one of the SMT Engineers. I showed you the PCB laser marking process we use and also the X-ray counting machine we have in our SMT kitting store.



05. ASRI Hashim

Process Engineering Section Manager

Hello, I am Asri and I explained to you the full range of soldering capabilities we have in-house including the Selective Soldering process.



06. SANGKARGANESH Suluraju

Process Engineer

Hello, I am Ganesh, a Process Engineer. I showed you the PCBA cleaning machine we use based on customer requirements and also the ionic contamination tester we have.



07. SL TEOH

Key Account Manager

Hi, I am SL. I showed you our 100k clean room (also known as ISO 8) which is mainly used for medical device manufacturing but can also be used by other clients if they require a clean room facility.



08. YASSER Mohamed

Process Engineering Section Manager

Hello, I am Yasser. The majority of our PCBA designs are in panel form and I showed you the router we use to de-panel them into single pieces prior to further assembly/test.



09. E.L. CHAI

Production Manager

Nice to have met you, I am Chai, Production Manager here at ESCATEC in Penang. I talked through the Layer Process Audit (LPA) board we use daily which we find very effective in improving quality control, productivity, and other levels of performance.



10. K.C. KHOO

Key Account Manager

Thank you for visiting, I am KC, one of the Key Account Managers that looks after clients with high-volume production requirements. I showed you one of our one-piece flow assembly lines and my MYCOM Team member Rafidah explained our process in more detail.



10. RAFIDAH Othman

Process Staff Engineer

Thank you, KC. As a reminder, the first stage of this process involves PCBA programming, and the final step is a complete box build assembly. For this particular client, we then pack the products and direct ship them.



11 & 12. ASRAF Abdul Razak

Senior Process Engineer

Hi, I am Asraf, a Senior Process Engineer. My focus is on automation opportunities within ESCATEC and implementation of projects. During your visit I showed you several cutting-edge machines we have invested in, including automated screwing, labelling and glue dispensing.

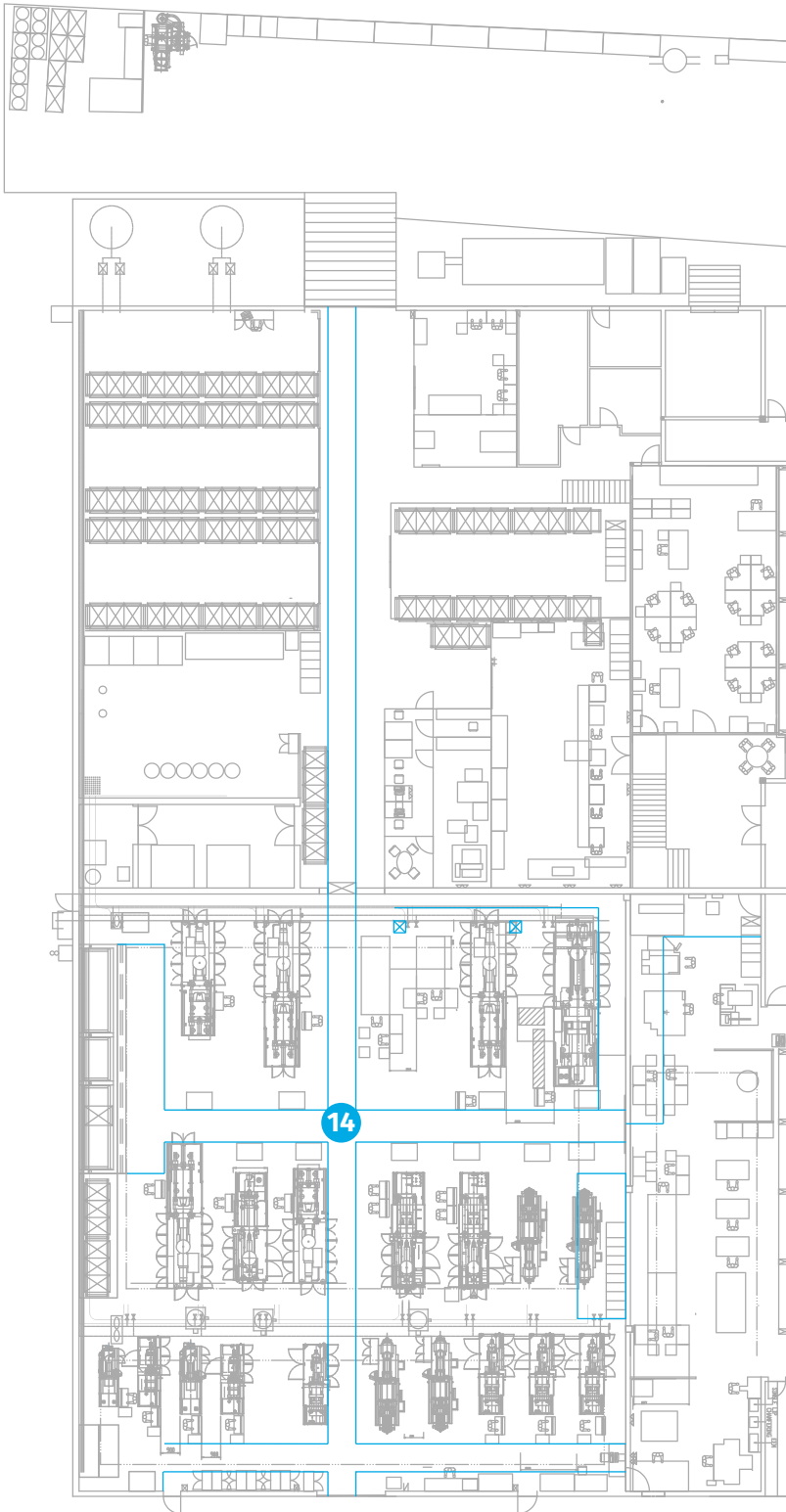


13. T.S. CHUAH

Production Section Head

Hello, I am Chuah, Production Section Head. I walked you through our packing facility whilst explaining our FIFO policy and our scanning-controlled packing process.

INJECTION MOULDING



14. SATHISAN Perumal

*Injection Moulding
Section Head*

THANK YOU FOR
VISITING OUR
PLASTIC MOULDING
PRODUCTION FACILITY
WHICH WE REFER TO
INTERNALLY AS 'P3'.

I explained our tooling maintenance and moulding processes and showed you each step we take from raw material receipt through to finished goods packing.

RESOURCES

Visit our [comprehensive content library](#), offering thought leadership and best practice outsourcing advice across a range of design, manufacturing and sector specific topics.



[VIEW CONTENT LIBRARY](#)



Design, manufacturing and lifecycle solutions built around you.

YOUR INTEGRATED MANUFACTURING PARTNER

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