Contents:

Welcome to Esco..................................................................................................... 1
Corporate Profile..................................................................................................... 3
Markets and Opportunities .................................................................................. 7
Research, Development and Manufacturing....................................................... 9
Testing and Certification....................................................................................... 11
Innovations and Technology Transfer ................................................................. 15
Esco Product Line.................................................................................................. 19
Knowledge Center............................................................................................... 33
Esco - The Industry Resource................................................................................ 35
Service, Support and Logistics.............................................................................. 37
Sales and Distribution.......................................................................................... 40
Since Esco was founded in 1978 our company has earned a reputation for innovation in the worldwide laboratory equipment and cleanroom industry. Today, Esco has emerged as a market leader in containment, clean air and laboratory equipment technologies with active sales in more than 100 countries and direct company offices in the top ten geospecific markets.

From our headquarters in Singapore, Esco directs a highly efficient research, product development, manufacturing and customer service program. We are the only company in our market that is completely configured to export most of what we manufacture. And because of our worldwide presence, and because we listen carefully to our customers and our distributors, you can have confidence that Esco products represent the best thinking in the world.

Esco is a story of hard work and entrepreneurship, empowerment of others, attention to detail and managing opportunity in response to world events. Our story is affirmed each day by many individuals born of cultural and ethnic diversity. Ours is a story of technical invention and imagination played out over a geographic expanse so broad that the sun never sets on what we do.

Our many languages and cultures, customs and traditions, and modern business management techniques blend into a single effort focusing on customer service, one customer at a time. As you learn more about Esco, you will understand why World Class. Worldwide. is more than a phrase. It’s part of who we are, where we are from and where we are going.

Esco remains privately held by the Lim family who continue to serve the company through two generations of top management.

Welcome to Esco.
From Singapore to the World

Singapore is a multi-cultural city state, a relatively small island nation that has flourished at the crossroads of history and geography since it was founded in 1819 as a business venture of the British East India Company. Singapore has always been synonymous with international trade. Since becoming a self-governing state in 1959, our immigrant population has remained expert in free market economics, setting the stage for the world. As a nation of commerce and ideas, Singapore has always been ahead of its time.

In 2010 the World Bank rated Singapore first among 181 world economies in ease of doing business. Singapore was ranked #1 in 2009, 2008 and 2007. Against this backdrop of commercial infrastructure and government support, Esco grows. And as Singapore continues to remain the best country in which to do business, Esco is committed to being the easiest company to do business with.

Today, from one of the world’s most cosmopolitan cities, and with dedicated people filled with energy and optimism, Esco serves present markets, plans for future markets, and strengthens our position as a global force in clean air and laboratory equipment technology.
Earning Market Recognition

Esco was established to provide clean air solutions for the emerging high-tech industrial and life sciences industries in Southeast Asia. Esco pioneered the development of clean air technology in this region by designing and constructing the area’s first cleanroom, a controlled environment in which airborne particulates are minimized by constant filtration to prevent product contamination. It is widely acknowledged that Esco was instrumental in the development of clean air technology now in use throughout Southeast Asia.

During the early 1980’s, we extended our expertise in clean air technology to construction of laminar flow clean air products, leading to the development of biological safety cabinets to complement our core competency in containment technology. During this time, the foundation for our export program was established, and resources to scale-up sheet metal and manufacturing capabilities were acquired.

Throughout the 1990’s, in response to market demand we shifted our business focus to clean air device manufacturing. Here, Esco earned a reputation as a leading specialist in clean air and containment products. At the same time, our internal infrastructure grew to embrace microprocessor-based controllers, metal machining and fabrication, compliance and certification, and microbiological testing required to substantiate product performance for the demanding scientific community.

Our Vision: Is to be a global leader in clean air, containment and controlled environment equipment solutions for the scientific, biomedical, pharmaceutical and cleanroom markets.

2001
Esco becomes first Asian manufacturer to earn EN 12469 certification for biological safety cabinets.

2005
Esco establishes Esco Technologies, Inc. to open markets in the United States, Canada and Mexico.

2006
Esco establishes Esco GB as sales and marketing subsidiary in the United Kingdom.

2007
Esco establishes technical center in Shanghai to expand R&D capabilities and product reach.
Founded in 1978, Esco quickly earned a reputation as a pioneer in cleanroom technology required by Asia’s burgeoning computer component industry. Esco has become the leading Asian manufacturer of biological safety cabinets.

**Advancing the Industry**

Esco and or its officers are members of the American Biological Safety Association (ABSA), Asia-Pacific Biosafety Association (APBA), Controlled Environment Testing Association (CETA), International Society for Pharmaceutical Engineering (ISPE), Laboratory Products Association (LPA), NSF 49 Joint Committee, Parenteral Drug Association (PDA), Scientific Equipment & Furniture Association (SEFA).

**Our Mission:**

We will:

– Provide employees a safe work environment that challenges, enables success, in which everyone can build a career,

– Deliver *zero-defect* quality, innovative, practical products at competitive prices offering the best value,

– Market a wide range of products for different customer segments, across multiple scientific equipment product categories,

– Achieve the industry’s lowest cost structures through operational effectiveness and continuous improvement,

– Provide the best customer care before, during and especially after the sale,

– Build long-term, mutually beneficial relationships with distribution partners worldwide, supported by Esco operations in the major markets,

– Build a global brand in the scientific equipment market recognized for the above attributes.

**Esco Core Values:**

– Attitude

– Competence

– Commitment

– Communication

– Growth

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Isoclean® - new compounding pharmacy isolators from Esco.

Frontier Acela® - the world’s first ergonomically designed, angled front, high performance low flow fume hood.

Labculture® Class II (Low Noise Series) – introduced the industry’s lowest noise (~50dBA per EN) biological safety cabinets.

Accuflow G2 – the world’s first voltage and temperature compensating speed control, specifically designed to virtually eliminate airflow fluctuations.

Isotherm® - new Laboratory Ovens and Incubators from Esco.

Pharmacon(TM) - new Downflow Booths from Esco.

Swift® MaxPro and MiniPro - new generation PCR thermal cyclers from Esco.
Esco serves a highly diversified customer base in micro-electronics, semiconductor, life science, biotechnology, pharmaceutical, research, education and clinical hospital markets.

**Markets and Opportunities.**

**International Customers**
As Esco continues to expand market share in key worldwide markets, we are pleased to include leading research and scientific institutions among our growing customer base.

- Amgen, USA
- Biocon Biopharmaceutical Pvt. Ltd., India
- Bristol-Myers Squibb, France
- Central Tuberculosis Research Institute, Moscow, Russia
- China CDC, Beijing, China
- Genentech, USA
- GlaxoSmithKline Biologicals, Netherlands
- Glaxo-Wellcome Operations, UK
- Harvard Medical School, USA
- Hospital Santa Fe, Mexico
- Katholeike Universiteit Leuven, Belgium
- KTL (National Public Health Institute), Helsinki, Finland
- Kyoto Pharmaceutical University, Japan
- Magrabi Hospitals, Saudi Arabia
- Makati Medical Centre, Philippines
- Medical Research Council, London, UK
- Ministry of Health, Kuwait
- Ministry of Health, Poland
- Monash University, Australia
- Nihon Pharmaceutical Industry Co. Ltd., Japan
- Novartis, UK
- Pfizer, Italy
- Project Directory on Poultry (ICAR), India
- Royal Melbourne Hospital, Australia
- Sanofi Aventis, USA
- San Miguel Brewery, Philippines
- Schering Plough, France
- Shanghai University, China
- Sigma-Tau Pharmaceuticals, Italy
- Silpakorn University, Thailand
- SmithKline Beecham, Australia
- TATA Institute of Fundamental Research, India
- The Jackson Laboratory, USA
- UCLA, USA
- Unilever Food Research Centre, Netherlands
- University of California, USA
- University of Illinois, USA
- University of Pennsylvania, USA
- US Department of Agriculture
- World Health Organization, Pfizer Italia SRL, Italy
- Wyeth Biopharma, USA
- Yale, USA

**Product Applications**
Esco products, services and consultative solutions are directed toward critical, capital intensive industries at the forefront of life sciences and allied technologies.

- Aerospace and Defense
- Agriculture, Food Sciences and Processing
- Animal and Veterinary Research
- Aseptic Processing
- Biotechnology Research
- Chemical Manufacturing
- Cleanrooms
- Contract Research Organizations (CROs)
- Electronic Media and Storage Device Manufacturing
- Electronics and Semiconductors
- Energy and Biofuel
- Government Research
- Hospital, Clinical and Medical Research
- Medical Device Manufacturing
- Optical Sciences and Manufacturing
- Pharmaceuticals Manufacturing
- Universities, Colleges and Schools
“Esco Micro is among the top laboratory equipment companies in the world, counting Pfizer International and Harvard University as its customers.”

Esco has more than 14,000 m² (150,000 sq.ft.) of research and development, laboratory, manufacturing, warehousing and administrative office space under roof, with additional room for expansion to accommodate emerging product lines and additional growth.

Research, Development and Manufacturing.

Research and Development
An integral part of our business planning effort is based on managing a robust research and development program in Singapore, Shanghai and the USA, balanced against an investment in service support, training and customer education. Compared to industry averages, Esco invests a significant percentage of annual revenues in research and development. As a result of our investment, and with continuous feedback and idea evaluation among our research, global sales, marketing, purchasing and manufacturing teams, Esco products reflect the best contemporary designs in performance, ergonomics and customer satisfaction.

Manufacturing
Because the Esco manufacturing model embraces a vertically integrated process from start to finish, and because Esco has reinvested in capital projects required to scale-up unit production to meet demand, Esco manufacturing capacity and throughput continues to outpace industry leaders throughout the world. Purchasing, incoming quality control, inventory management, fabrication, testing and logistics are managed by the company’s production administration teams in Singapore and Indonesia.

Esco’s proximity to emerging world markets offers additional advantages in sourcing the latest component and sub-assembly selections available through valuable partnerships and alliances. Esco’s facilities employ state-of-the-art, computer-controlled tooling systems and operate under ISO 9001 and ISO 14001 certified quality and environmental management programs. As a result, Esco quality continues to be validated by leading scientific research and industrial organizations.
Core Competencies in Research, Development and Manufacturing Engineering

Service to worldwide markets in capital equipment industries requires a broad range of complementary technical and academic disciplines. The Esco team of engineers, scientists, technicians and marketing specialists represent decades of practical experience and an impressive knowledge base. Core competencies include:

- Antimicrobial powder coating products and methods
- Balanced ultralow temperature cascade refrigeration design
- Chemical and vapor containment, testing and fume scrubbing
- Cleanroom and isolation system design, filtration, egress and maintenance
- Computational fluid dynamics and airflow design, control and monitoring
- Controlled environments - temperature, CO2, O2 and humidity
- Data point placement management, acquisition, logging and communications for predictive maintenance and performance, certification, validation and compliance (FDA21CFR) and other standards
- Electromagnetic interference (EMI/EMC) mitigation, elimination and compliance
- Embedded systems hardware, software development and integration
- Environmental testing in variable temperature, humidity and lighting conditions
- Flame and chemical-resistant materials evaluation, testing and integration
- Hydrogen peroxide and UV-based contamination control techniques, protocols and methods
- Industrial design, ergonomics and intuitive user interface, service accessibility and safety
- In-house testing, compliance and certification management to international standards for safety and performance
- Lead shielding for nuclear medicine protocol containment and protection
- Mechanical, electrical, electronic and software design, component evaluation and worldwide sourcing
- Microbiological testing for containment and safety
- Packaging design, vibration, shock and transit testing
- Physical and performance testing for clean air products
- PID control algorithms development and tuning
- Sheet metal fabrication, welding and finishing technology
- Single stage refrigeration systems development
- Thermo cycling and Peltier temperature control
- ULPA, HEPA and activated carbon filtration technologies and applications
- Wind tunnel testing and product evaluation

Esco directly employs more than 400 persons, 70% of whom live and work outside of Singapore.
Testing and Certification.

| Processes and Manufacturing | ISO 9001, Worldwide  
<table>
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<th>ISO 14001, Worldwide</th>
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| Biological Safety Cabinets | NSF/ANSI 49, USA  
|                            | EN 12469, Europe  
|                            | JIS K3800, Japan  
|                            | SFDA-YY 00569, China |
| Fume Hoods                 | ASHRAE 110, USA  
|                            | BS 5726, UK  
|                            | EN 14175, Europe |
| Ductless Fume Cabinets     | AFNOR NF X 15 211, France  
|                            | ASHRAE 110, USA  
|                            | BS 7989, UK |
| Pharmacy Compounding Isolators | USP 797, USA  
|                            | CETA CAG-001-2005, USA  
|                            | CETA CAG-002-2006, USA |
| Air Quality                | ISO 14644.1, Worldwide  
|                            | JIS B9920, Japan |
| Filtration                 | EN 1822, Europe  
|                            | IEST-RP-CC001.3, USA  
|                            | IEST-RP-CC007, USA  
|                            | IEST-RP-CC034.1, USA |
| Electrical Safety and Performance | UL-61010-1, USA  
|                            | CAN/CSA-C22.2 NO.61010-1  
|                            | IEC 61010-1, Worldwide |

Compliance and Safety

Esco is committed to compliance with international standards for product performance, safety and energy efficiency. Certifications and recommended practices apply to products, manufacturing processes and administrative documentation including biological safety cabinets, fume hoods, air quality, electrical safety and more. These are critical to our business model and to our relationships with customers, distributors and certifying agencies.

Certification pathways are managed in-house, supervised in-house by third-party accreditors, or outsourced to independent certification agencies. Certification, compliance, recommended practices and agency listings represent a significant investment on behalf of our valued customers.
Microbiological Testing Processes

Esco performs testing in accordance with more than 10 of the world’s most recognized standards for local, regional and international criteria. Testing in our microbiology laboratory is conducted according to NSF49:2002, EN12469:2000, and JIS K3800:2005 to determine product performance and efficacy related to protection of personnel, product and cross contamination within the work area when using potentially hazardous samples.

NSF-accredited biohazard cabinet field certifiers are available in-house full-time to supervise all testing work, using harmless Bacillus atrophaeus (formerly Bacillus Subtilis) to challenge the cabinet. These samples are then incubated for 48 hours before Colony Forming Units (CFUs) are counted to determine the testing results.

To establish real-world conditions, we increase microbiological challenge tests to include placing objects inside the cabinet work zone, use of a Bunsen burner, external airflow disturbances from the laboratory, and Human-As-Mannequin tests adapted from Fume Hood development.

Underwriters’ Laboratories Accreditation

In 2006, following an on-site assessment under the Underwriters’ Laboratories (UL) Witness Test Data Program, the Esco Electrical Testing and Research Laboratory Facility in Singapore was certified to perform tests under the following standards: UL 61010A-1, UL 61010-1 and CAN/CSA C22.2 no 61010-1. The 61010-1 family of standards covers electrical safety requirements for laboratory and control equipment in North America, Europe and Asia.

This accreditation certifies that Esco facilities, equipment and personnel needed to move towards “self-certification” will accelerate new products to market, strengthen internal capabilities and enable Esco to build better and safer products for our global customers.

Esco is the only biological safety cabinet manufacturer in the world (and possibly the only laboratory equipment manufacturer in Asia) to gain UL accreditation. This investment reinforces our commitment to excellence and product engineering assures our customers that we have the best equipped research & development team in the world developing the safest laboratory equipment possible.

In-House Testing Facilities and Infrastructure

Because testing and certification are integral to our product lines, Esco has invested in in-house testing facilities staffed by full-time microbiologists and NSF field certifiers. These facilities are configured to accommodate independent testing agents and third-party certifiers who visit Singapore regularly to perform compliance audits and to assist our research team in pre-certification of new products before they are submitted for formal certification.

Our testing facilities include controlled-environment walk-in room to create temperature and relative humidity ambients, a wind tunnel, a microbiological laboratory with associated cell culture and bacteriological analysis systems, and networked computer systems for fluid dynamic modeling and interpretation, data acquisition, management and archiving.
ASHRAE 110 and EN 14175 Testing

For fume hoods and other products Esco uses primary and supplemental testing protocols such as ASHRAE 110, EN 14175 containment and activated carbon adsorption testing to evaluate, document and ultimately improve product performance in all phases of manufacturing, installation and operation.

Typical testing areas include:
- Tracer Gas Containment
- Robustness Test (EN 14175)
- Face Velocity
- Airflow Patterns Visualization
- Energy Efficiency
- Ergonomics (Light, Noise, Sash Operation)
- Filter Efficiency, Retention Capacity
- Scrubber Efficiency
Mini-pleat Filter Construction

Modern separatorless mini-pleat filters maximize the filter surface area to extend filter life and eliminate possible filter media damage by thin and sharp aluminum separators used in conventional filter construction. The filter assembly is constructed in accordance with EN1822 requirements.

**ISOCIDE™**

Unless otherwise specified, Esco products are externally finished with Isocide powder-based coating, providing durability, cleanability and integrated antimicrobial characteristics which remain effective against surface contamination for the life of the cabinet. Isocide eliminates 99.9% of surface bacteria within 24 hours of exposure.
Esco Products

World sourced components permit us to test and integrate the most innovative solutions to our products. What we learn in one part of the world we can apply to another and, eventually, to your laboratory. As a result, Esco products represent the most pervasive applications of controlled environment laboratory and cleanroom equipment solutions in the industry.

Innovations and Technology Transfer.

Accuflow™
Esco has developed the Accuflow microprocessor speed controller to maintain steady motor/blower speed despite building voltage fluctuations, thereby assuring constant face velocity and downflow for optimum safety, containment and protection.

Dynamic Chamber Plenum™
Many Esco biological safety cabinets incorporate a unique Dynamic Chamber Plenum with angled downflow orientation to optimize airflow uniformity over the work surface, and to simplify filter maintenance and certification. The Dynamic Chamber Plenum underscores Esco’s attention to details in component application through intelligent design.

Dual Blower, Patent Pending
Esco Infinity and Airstream Duo biological safety cabinets employ a double blower system to provide the maximum possible level of safety.

“Cross pollination. Like the honeybee, what we discover in one field we bring to another. That’s technology transfer at Esco.”
Camfil Farr® ULPA Filters

Esco cabinets use supply and exhaust filters that provide >99.999% typical efficiency for particle sizes of 0.1 to 0.3 microns. Filters meet the IEST-RP-CC001.3 recommended practice for ULPA performance (USA), and EN 1822 for H14 performance (EU). These provide better filtration capability than conventional H13 HEPA filters that have a typical efficiency of >99.99% for 0.3 micron particles.

For some products, however, conventional HEPA filters are used depending on the application and local preferences of geospecific markets.

ebm-papst® Motor

Selected Esco cabinets use high performance, German made ebm-papst permanently lubricated, centrifugal motor/blowers with external rotor designs. Selected for energy efficiency, compact design, and flat profile, completely integrated exhaust blower assemblies optimize motor cooling with unified rotating parts and overall component balance for smooth, quiet, vibration-free operation. Weight is equally distributed to all bearings to extend bearing life, transfer heat and maximize speed control.

Illustration showing ebm-papst integrated motor/blower assembly (left) vs. conventional configuration with motor, shaft and blades (right).

Sentinel™ Suite of Microprocessor-Based Controllers

Esco has developed the Sentinel suite of microprocessor-based control and alarm systems to supervise cabinet functions throughout the product line. Sentinel controllers range from simple to sophisticated. Setpoints and other applications are user-activated through touch-pad programming. Digital value outputs for remote alarm, monitoring and compliance are featured in the latest generation Sentinel controllers, along with downloadable software updates and graphic data expression functions.

Sentinel control system, Infinity® Class II Microbiological Safety Cabinet

Ergonomics

Many Esco products are used in processes that require long hours seated or standing in laboratories and production facilities. As a result of internal and commissioned research in human interface, intuitive control design, ergonomics and workplace physiology, Esco has adapted product designs to improve comfort, visibility and productivity.

Product design attributes include sloped front access to improve interior reach, curved armrests, high-efficiency lighting and optional adjustable work surfaces. Control systems have large, easy-to-read digital displays, touchpad controls with tactile feedback, and logically arranged functions with on-board tutorials if needed.
International Shipping Packaging

To assure safe delivery to destinations throughout worldwide markets, Esco has developed Esco EnRoute™, an internal quality and logistics program designed to assure timely shipment and to eliminate damage during transit. Because most Esco products are destined for international sales, our administrative processes and documentation have evolved to include efficient, environmentally-friendly and well-designed packaging, prompt order confirmation, shipping advisories and status notifications to our global distribution system. Esco’s EnRoute packaging and shipping program includes destructive testing and analysis for optimum packaging to mitigate shipping damage, claims and installation problems before they occur.

More than 95% of Esco products are shipped to international locations beyond Singapore, validating Esco’s position as one of the industry’s leading exporters of high-quality laboratory products.

Berkeley Fume Hood® Design

In 2006, Esco was granted an exclusive global license to commercialize low-airflow fume hood technology known as the Berkeley Fume Hood protocol. Developed at the Lawrence Berkeley National Laboratory, California, USA, and covered by two U.S. patents, the Berkeley technology uses directed air currents to improve safety, containment and energy-saving properties.

Recognized by laboratory architects, planners and designers as one of the most significant developments in fume hood technologies in a generation, the Esco Berkeley design delivers superior containment and user protection at very low face velocities (down to 0.3m/s). As a result, the Esco Berkeley design minimizes energy, reduces ventilation expenses, and decreases dependence on fossil fuels.

Today, as Esco applies the Berkeley protocol to an entire new generation of fume hoods for life science, laboratory and educational applications, Esco market share in established and developing industrialized nations will expand.

Performance Envelope

Esco biological safety cabinets are designed to operate within a performance envelope to maintain protection for personnel, product and the environment. Airflow parameters are used to frame the performance envelope including Inflow Velocity and Downflow Velocity. The range between high and low Inflow, and high and low Downflow, together with the fluid dynamics achieved through sophisticated cabinet design, proportionally sized capture slots, and uniform laminar airflow, combine to deliver a complete containment and safety solution expected of a professional biological safety cabinet.

The graph illustrates the boundaries of the performance envelope (based on 1.2 meter/4’ cabinet), as well as the nominal performance point at which tests are conducted.
Energy Efficiencies and Environmental Impact

Energy consumption and operating costs are critical factors in Esco new product designs and manufacturing engineering improvements. Energy management considerations range from component evaluation and selection to cabinet operation and airflow. Because many Esco products exhaust treated or filtered air to the environment, improvements in exhaust mitigation to relieve facility heating and air conditioning systems is a top R&D priority.

Esco innovations in energy management and environmental impact range beyond the laboratory, including product technical advances such as the Berkeley Fume Hood protocol, intelligent selection of packaging and crating materials, reducing manufacturing utility consumption and aggregation of destination shipping bundles to lower shipping costs and save fuel.

Metalwork Finishing

Robust construction and enhanced safety features qualify Esco cabinets for the most demanding laboratory applications. Unless otherwise indicated, cabinets are fully assembled and ready to install and operate when shipped. The highest quality Type 304 stainless is used for interior construction, and work surface components are removable for easy access and surface decontamination.

Color Coded Components

International design attributes of Esco products include the use of color and color-coded components to communicate process and function. Assemblies exposed to contaminated airflow are color-coded for easy recognition. The telescoping Dynamic Chamber™ plenum minimizes physical lifting and accelerates filter change when required. Key components with the exception of the motor/blower assembly are mounted outside the air stream and away from contaminated air to permit service without decontamination.
Esco Product Lines.

**Esco Global Product Lines**

Esco product lines and brand strategies support localization of products to geospecific markets, taking advantage of Esco capability to adapt to regional and local requirements and compliances. As in any multinational company, individual brands are designed to accommodate unique user preferences in more than 100 countries while maintaining a distinct brand connection to Esco. Through our branding program the Esco promise of quality and performance translates from one market to the next, and is useful to the highly mobile life sciences industry as researchers find familiar products from one institution to another.

- Biological Safety Cabinets
- Cleanroom Products
- Compounding Pharmacy Equipment
- Containment / Pharma Products
- Ductless Fume Hoods
- In Vitro Fertilization Workstations
- Lab Animal Research Products
- Laboratory Fume Hoods
- Laboratory Ovens and Incubators
- Laminar Flow Clean Benches
- PCR Products
“We’ve passed more performance tests, in more languages, for more certifications, throughout more countries, than any other biological safety cabinet manufacturer in the world. We’ll pass your test, too.”
Biological Safety Cabinets

Esco Biological Safety Cabinets represent more than 20 locally, regionally and internationally-recognized certifications. These accreditations testify to the enhanced performance of Esco products in biological and microbiological applications.

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<th>Product</th>
<th>Performance</th>
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<tr>
<td>Airstream.</td>
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<tr>
<td>Infinity.</td>
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<td>Labculture PLUS.</td>
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<td>Labculture RELIANT.</td>
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<td>Labculture.</td>
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<td>Streamline.</td>
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Cleanroom Products

Esco Cleanroom products include fan filter units, air showers for cleanroom environments, as well as modular cleanrooms designed for small laboratories. Backed by decades of experience, Esco Cleanroom Products offer state-of-the-art designs compliant to the latest international standards.

- Fan Filter Units
- Modular Rooms
- Air Showers
- Pass-Thru Systems
- Cleanroom Light Fixtures

Cleanroom Apparel and Clothing

The Esco Cleanroom Apparel product group is a valuable part of the Esco legacy in regional cleanroom products, supplies and consultative solutions dating back to the company’s origination in 1978. Products include cleanroom clothing for electronic, semiconductor, pharmaceutical and food industries.
Compounding Pharmacy Equipment

Esco Compounding Pharmacy Equipment provide a safe and clean environment for compounding of sterile drug preparations and IV admixtures in compliance with USP 797 criteria. Depending on the nature of compounds being processed, Esco Compounding Pharmacy Equipment can be selected for any of two work zone relative pressure options, all of which feature vertical laminar airflow across the work surface to assure ISO Class 3 level cleanliness within the work area.

Product

Isoclean, Compounding Aseptic Isolators

Isoclean, Compounding Aseptic Containment Isolators (recirculating)

Cytoculture, Cytotoxic Safety Cabinets
Containment / Pharma Products

The increasing potency of today’s pharmaceutical compounds, as well as demanding health and safety requirements, have led to a greater need for containment equipment in the manufacture of pharmaceuticals. Rapid regulatory developments have also occurred in the aseptic processing field, pushing manufacturers of parenterals and aseptic products to meet ever-increasing quality criteria.

Esco offers a complete range of solutions designed for pharmaceutical processing in both the containment and aseptic processing fields:

- Downflow booths for the processing of Active Pharmaceutical Ingredients (APIs) with Occupational Exposure Limit (OEL) below 50μg/m³
- Containment enclosures and isolators for OELs below 1μg/m³
- Sterility test isolators with integrated hydrogen peroxide decontamination

Esco differentiates ourselves from the competition by offering:

- A complete, consultative, turnkey solution
- The ability to pool resources and application expertise from a worldwide network of leading containment and aseptic processing experts
- Cross-functional product design, manufacturing, engineering and validation expertise
- Mechanical design
- Electrical design
- Software development
- Computational fluid dynamics
- Hydrogen peroxide decontamination integration and validation
- Microbiological testing and validation
- IQ/OQ protocol development
- Vertically integrated manufacturing and services
- Worldwide components sourcing and integration
- Sheet metal / stainless steel fabrication
- Electro-mechanical integration / assembly
- Factory Acceptance Tests (FAT)
- Delivery, installation, IQ/OQ execution
- Worldwide sales and service support through our global network of subsidiaries

Product

PHARMACON, Downflow Booths
PowderMAX, Powder Weighing Stations
Ductless Fume Hoods

Esco ductless fume hoods are independently tested by INVENT-UK for the ability to filter contaminated air with efficiency and retention capacity as required by the British Standard BS 7989 and French Standard AFNOR NF X 15-211. Fume containment and airflow uniformity meet the requirements of ASHRAE 110-1995, BS 7258, EN 14175-3 and AFNOR NF X 15-203. The Esco combination of high performance and carbon filtration opens new, cost effective applications for fume hood technology in schools, classrooms and laboratories. Associated products include Esco chemical storage cabinets.

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<th>Product</th>
<th>Performance</th>
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<td>Ascent•MAX.</td>
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<tr>
<td>Ascent•OPTI Basic.</td>
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<td>Ascent•OPTI.</td>
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**In Vitro Fertilization Workstations**

The Labculture IVF workstation is specially designed for use in fertility laboratories for research work in the fields of human and animal reproduction. A controlled work environment is of high priority due to the complexity of the process. This includes hygienic conditions to minimize microbial contamination, a warmed work surface for the sustenance of biological matter and provisions for the use of microscopes.

The enhanced filtration system on the IVF workstation is designed to provide the highest level of air quality within the work zone, meeting all relevant standards.
Lab Animal Research Products

The U.S. National Institute for Occupational Safety and Health (NIOSH) suggests that animal handlers should ensure measures are taken to protect themselves from exposure to animals and animal products which can cause occupational hazards such as asthma and allergies (NIOSH 1998). Esco experience in clean air and containment technologies extends to lab animal research products to help protect the investigator, animal technicians, animals and the environment during research, cage changing and bedding disposal procedures. When used in conjunction with established operating procedures, Esco lab animal research products help laboratories comply with NIOSH recommendations to create a safer, more productive and healthier work environment.

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<th>Product</th>
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<tr>
<td>VIVA. Dual Access Workstations</td>
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<td>VIVA. Universal Workstations</td>
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<tr>
<td>VIVA. Bedding Disposal Units</td>
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<tr>
<td>VIVA. Air Showers</td>
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</table>
Laboratory Fume Hoods

Laboratory Fume Hoods are typically placed on laboratory benchtops to capture, contain and exhaust contaminated air. Esco fume hoods have been independently tested by INVENT-UK to pass the American standard ASHRAE 110-1995 and British Standard BS 7258 (determining fume containment capability). They have also been successfully tested for fume containment specified in the European Standard EN 14175-3. Esco’s Berkeley Fume Hood is the industry’s most energy-efficient ducted fume hood, and is manufactured by Esco under a proprietary arrangement.

Product

Frontier, **ACELA**

Frontier, **ACID DIGESTION**

Frontier, **BERKELEY**

Frontier, **DUO**

Frontier, **EDUSAFE**

Frontier, **FLOOR MOUNTED**

Frontier, **JUNIOR**

Frontier, **MONO**

Frontier, **PERCHLORIC**

Frontier, **RADIOISOTOPE**
Laboratory Ovens and Incubators

Introducing Esco Isotherm® - world class laboratory ovens and incubators from Esco with the technologies and compliance to prove it. Ergonomic, intuitive interfaces, microprocessor PID controls with programming options, 4 zone heated air jacket, precisely tuned and tested ventilation and insulation package, all supported by Esco’s solutions-based sales and service representatives worldwide.

Product

Isotherm, Forced Convection Laboratory Ovens

Isotherm, Forced Convection Laboratory Incubators
**Laminar Flow Clean Benches**

Esco is an industry leader in the development of professional quality laminar flow clean bench cabinets. With tens of thousands sold throughout the life sciences market worldwide, Esco has reinforced its reputation for dependability by providing reliable protection for samples and work processes in a multitude of applications.

Our selection of Vertical, Horizontal and Specialty clean bench cabinets offers a variety of choices for installations where high quality construction is essential. Our clean bench cabinets are aerodynamically engineered and use only premium quality ULPA filters with integrated motor/blower assemblies for quiet operation and long service life.

<table>
<thead>
<tr>
<th>Product</th>
<th>Airflow</th>
<th>Microprocessor</th>
<th>Sides</th>
<th>Work Zone Access</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labculture.</strong> Horizontal</td>
<td>Horizontal</td>
<td></td>
<td>Stainless Steel</td>
<td>Open Front, Optional Front Cover</td>
</tr>
<tr>
<td><strong>Labculture.</strong> Vertical</td>
<td>Vertical</td>
<td></td>
<td>Stainless Steel</td>
<td>Open Front, Optional Front Cover</td>
</tr>
<tr>
<td><strong>Airstream.</strong> Horizontal</td>
<td>Horizontal</td>
<td></td>
<td>Glass</td>
<td>Open Front, Optional Front Cover</td>
</tr>
<tr>
<td><strong>Airstream.</strong> Vertical</td>
<td>Vertical</td>
<td></td>
<td>Glass</td>
<td>Open Front, Optional Front Cover</td>
</tr>
<tr>
<td><strong>Airstream.</strong> Horizontal, Stainless Steel 2.4 m (8')</td>
<td>Horizontal</td>
<td></td>
<td>Stainless Steel</td>
<td>Open Front, Optional Front Cover</td>
</tr>
<tr>
<td><strong>PCR Cabinet.</strong></td>
<td>Vertical</td>
<td>*</td>
<td>Glass</td>
<td>Hinged Window</td>
</tr>
<tr>
<td><strong>OptiMAIR.</strong> Vertical</td>
<td>Vertical</td>
<td></td>
<td>Glass</td>
<td>Sash</td>
</tr>
</tbody>
</table>

* only available for 0.9 m (3') and 1.2 m (4') models, 0.6 m (2') models are equipped with rocker switches.
PCR Products

Esco PCR products are used in genomics, proteomics, molecular biology and forensic sciences where DNA amplification is required. Our real-time and programmable thermal cyclers, shaking micro incubators and accessories fulfill an emerging demand for complementary products found in the same laboratory environments as the company’s clean air and laminar flow line.

<table>
<thead>
<tr>
<th>Product</th>
<th>Peltier Temp Control</th>
<th>Programmable</th>
<th>DNA Amplification</th>
<th>Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Time Thermal Cyclers</td>
<td></td>
<td></td>
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<tr>
<td>Spectrum®48.</td>
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<tr>
<td>Thermal Cyclers</td>
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<tr>
<td>Swift®MiniPro.</td>
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<td>Swift®MaxPro.</td>
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<tr>
<td>Shaking Micro Incubators</td>
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<tr>
<td>Provocell.</td>
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</tbody>
</table>
Please select the website

Global Site
North America
China
Europe
UK

Biological Safety Cabinets

Esco is recognized as a global player in containment, clean air and laboratory equipment technology. We are highly oriented towards the international marketplace, with distribution in more than 100 countries and a direct presence in 10 of the key global markets. Esco represents innovation, forward-thinking design, coupled with the tradition of quality since 1978.
Continuing Education and Training

The nature of our product demands that Esco establish and maintain the highest standards for laboratory safety. Esco regularly organizes training courses and seminars designed to educate laboratory scientists, users, safety officers and technicians on matters related to the installation, use, operation, and maintenance of our products.

Technical workshops are conducted by an Esco NSF-accredited Biological Safety Cabinet field certifier. Participants include Esco sales and service personnel, distributors, independent certifiers and validation company technicians who specialize in the testing and validation of clean air equipment. Esco conducts quarterly training seminars in Singapore, and professional development seminars on location on subjects ranging from biological safety theory to customer support, consultative sales and integrated marketing. These workshops are designed to keep Esco distributors updated on the latest product developments, as well as, to acquire feedback and ideas from sales and service personnel who work directly with end-use customers.

Many of our workshops are organized in conjunction with international, national or regional trade shows or seminars.
For the latest information related to Esco products, services, training, exhibitions and company news, visit our corporate Web site at escoglobal.com. Features of the Web site include:

- Unique portals for numerous geographic markets worldwide
- A document library updated with the latest product literature, specifications, site preparation information and operating manuals
- An up-to-date case history database with information on who is using Esco products and where, searchable by product, application or world location
- Live Support
- A Biosafety Resources Portal with links to Web sites and other resources of interest
- Complete contact information for global sales, service, certification and corporate management
More than 85% of Esco revenues are derived from international markets.

Esco - The Industry Resource

Customer Information Systems
Global sales, marketing and customer service require a robust communications system containing the latest, most accurate information accessible through an intuitive process. Esco has embraced a Web Centric approach through the company’s central Web site at www.escoglobal.com. The Web site serves as an information repository in support of customers, regional sales and office managers, distributors and their sales staff, certifiers and maintenance partners.

The Esco Web site contains a searchable database of all products by technical attribute, Esco brand, keyword applications, competitor models and more. Other Web site functions simplify the customer experience and accelerate the product evaluation, purchasing, installation and operations process.

Our library is constantly upgraded to include white paper and technical reports on subjects ranging from product applications to filtration, components and best practices related to Esco products in the field. Features include:

- Central repository for Esco information
- Portal for product literature, purchase specifications, operating manuals, white papers and technical reports
- LiveSupport function for online assistance
- Detailed intranet for Esco sales and service personnel improves customer service
- Links for Esco Sentinel series controller software and other software downloads

Global marketing, information systems and brand management programs are managed by the Esco team in the United States and Singapore for use in all markets.

Customer Education
As Esco emerges as a worldwide market leader, our responsibility to the life science industry evolves proportionally. Because we believe an informed customer is a valuable resource, our training and familiarization classes in Singapore and outreach programs in all markets extend to customers as well.

As the epidemiology of infectious diseases, industrial hygiene, and occupational safety issues continue to challenge governments and scientists around the world, Esco aims to position itself as an industry resource to promote customer safety and outreach efforts in Southeast Asia and beyond.
Service, Support and Logistics.

Technical Service and Installation

Product service at Esco begins with product design. We view certifiers and product maintenance personnel as among our most valuable stakeholders, relying on their field experience for ideas whenever new products or product improvements are warranted.

– Our products include provisions for quick, efficient installation and set-up, initial certification if required, routine preventive maintenance, and accessible, maintenance-friendly component orientation for field-level maintenance.

– Esco biological safety cabinets include color-coded components to indicate biohazard potential. Filters are easy to replace by qualified certifiers. Esco cabinets are among the easiest in the industry to certify upon commissioning or following maintenance.

– For in-warranty maintenance, Esco maintains a network of independently owned, factory authorized service companies who specialize in life sciences and related instrumentation. Through our extended outreach program, our technical staff regularly trains service personnel in all world markets. Our distributors and technical sales personnel are offered basic systems training to assist end-users in making proper product selection to match the intended application.

– For key accounts where large quantities of Esco products are used, Esco trains in-house and facility maintenance staff to perform in-warranty service on Esco products without the need for a third party. For information on institutional maintenance training and maintenance programs contact Esco or your sales representative.

– In addition, many independent distributors, dealers and sales representatives authorized to sell Esco products offer localized service and maintenance packages in association with their account and customer relations program.
Parts Availability
Whenever service is needed and parts are required, minimizing downtime is a critical objective. Statistical usage analysis helps Esco predict parts life, permitting Esco to manage logistics and stage proper inventories around the world. The combination of predictive maintenance, historical data and geospecific proximity assures our customers that parts and labor are available whenever service is scheduled through the local sales organization.

Registration, Documentation and Instruction
Quality control at Esco extends from research and development through engineering, manufacturing, shipment, delivery and customer feedback. Esco maintains an aggressive program to encourage warranty card registration by mail, email or online submittal so that we know where Esco products are located and how they are being used. Data from our warranty registration program is confidential and provides us with valuable contact information should we ever need to notify you about your Esco product.

All Esco products include unique serial numbers for identification.

Most biological safety cabinets are individually KI performance tested for performance and cabinet integrity before they are packaged and shipped.

Documentation for all performance tests is archived and maintained for customer reference.

Laboratory Planning
Lab planners are learning they can depend on Esco Labculture biological safety cabinets to deliver the best value for single or multiple cabinet installations in new or existing labs. Esco cabinets are quiet, cost effective and backed by redundant safety systems to protect the operator, the work and the environment.

Each cabinet is microbiologically proven, independently tested and locally serviced. Don’t specify a biological safety cabinet until you’ve compared Esco quality for yourself. Labculture cabinets are now available throughout the USA and Canada from our fully stocked North American product center.
Esco EnRoute™ Packaging Protocols, Shipping Readiness and Logistics

Esco products are properly prepared for shipment. Because shipping conditions vary throughout the world, we submit our packaging designs to worst-case testing before final package configurations are approved.

Third-party testing examines component design and orientation, fasteners and hardware, parts for assembly such as fluorescent lamps, operating component security such as sashes, work trays and filters, and cosmetic appearance. Additional testing for shock and vibration assists our designers in apportioning package components, cushions, boxes, skids and crates to offer the most efficient protection. Finally, statistical analysis of shipping claims is returned to our package team to help mitigate shipping problems before they occur.

Logistics and container shipping management is a critical part of the Esco distribution mix. Because Singapore remains one of the top three shipping ports in the world, our aggregated shipments to key geospecific markets are easily managed from our headquarters in Singapore. Stocking directives from our distributors are processed through the factory, containerized and marshaled according to a sophisticated schedule that reduces lead time on customer orders significantly below industry norms.

References and Links
For more about Esco products, markets, employment opportunities, history, education, information resources, and Singapore, visit our information portal at www.escoglobal.com.

– About Esco
– Employment at Esco
– Esco Products
– Esco Markets
– Esco Distribution
– Vendor Information: Doing Business with Esco
– Safety and Certification
– Industry Associations and Resources
– Singapore
– Esco Partnerships and Alliances
Esco products are sold by highly trained technical sales specialists who manage customer and account relationships through consultative and solutions-based sales. While the sales equation varies from one geospecific market to the next, Esco provides technical and administrative direction from our direct support offices in key world market centers.