pharmadule®
A Morimatsu Group Company

From Concept to Production

Project Delivery & Services
- The Modular Way

We take you from Concept to Production

The increased competitiveness in the Life Sciences industry requires service providers like Pharmadule to deliver complete systems and solutions that gives the predictability and reduced risk needed to meet your objectives. With an array of products and services covering design & engineering, off-site construction, modular facilities, process skids and equipment and validation services we are able to offer industry specific solutions every step of the way to ensure your business case becomes a success.

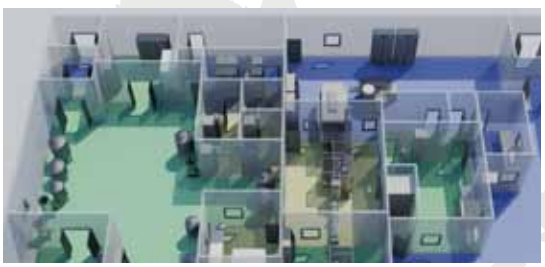
From the start in 1986 more than 60 manufacturing plants have been delivered to the Life Sciences industry worldwide using Pharmadule's modular, off-site constructed, concept.

Since 2011 we are a part of the Morimatsu Industry Group. With our head office in Stockholm (Sweden) and operations in Shanghai (China) and New Jersey (USA) we are ready to serve you wherever you are located.

Building on our previous experience and success we are dedicated to serve the Life Sciences industry. But, we are also expanding into new areas such as the cosmetics, food & beverage, consumer products and fine chemical industries.

As part of the Morimatsu Industry Group we are in a unique position to offer complete solutions, including process equipment, integrated into our off-site constructed modular facilities accompanied by our value adding services.

As a total solution provider we offer you cost-efficient and short delivery, predictability and reduced risk for your upcoming needs.



Our Offering

With global reach and local knowledge, we take pride in delivering services and production facilities to the Life Sciences and Consumer Products industries to clients all over the world.

Depending on your project and business case, we base our offering on four "modules" that can be applied separately or combined into a turn-key project approach.

Leading pharmaceutical companies such as Eli Lilly, Merck, Baxter, GlaxoSmithKline, Genentech, Pharmacia and AstraZeneca have all used the Pharmadule modular concept for their manufacturing buildings worldwide.

Every project is unique and at Pharmadule, we're committed to provide your business with that competitive edge. Our extensive skills and experience ensure, that each project is a smooth, precise operation, meeting your quality requirements.

Our Areas of Expertise:

- Biopharmaceuticals
- Fill finish & Aseptic Processing
- Chemical API
- Oral Solid Dosage
- Dry and liquid processing for cosmetic products
- Dry and liquid processing for flavors and fragrances

Our Benefits:

- Faster delivery
- Cost-efficient & fixed price
- Guaranteed time schedule
- Integrated validation
- Controlled conditions
- Predictable results

Predictable Outcome - On Time & On Budget

Our predictable and well-proven delivery model, based on our modular concept and off-site construction, will ensure the success of your project - meeting the market demand and optimizing your return on investment.

In our industry it's vital to keep schedules. To get your new pharmaceutical manufacturing facility up and running on time, it is crucial that your critical process systems perform as specified and that you are able to satisfy your commitment to patients.

Every capital project is a business critical decision and the ability to predict the outcome is of outmost importance. For us predictability means you get what you expect when you expect it.

When you work with us you know you're dealing with fixed prices and schedules when moving into detailed design and project delivery. Everything is transparent from the very beginning.

Time is Money - Speed is Key

Regardless if you want to get your new product to market before the competition or if you want to expand your capacity for existing products time is money. If you can shorten the delivery schedule for your new facility you will reduce your project costs and you get the opportunity to get to the market faster.

Our delivery model has often proved to be faster than conventional methods, from 3-24 months depending on the project. We can achieve this through our off-site construction and integration approach with a high degree of concurrent activities. The shorter delivery time gives your project a higher net present value and the opportunity for a faster Return on Investment (ROI).

Flexible Solutions - Today & Tomorrow

We believe that you should build what you need now and not build for the future. When there is a need to expand and modify your facility - we will assist with minimal disturbance at site owing to our off-site fabrication.

With the modular system your facility can easily and with minimal disruption be expanded when market demand grows. By taking future expansion needs into consideration in the planning stage, the design will accomodate capacity increases to be built when the market need is there. In this way the initial investment is optimized by only building what you need when you need it.

Our modular system is an open structure where you can create large rooms spanning over multiple modules. This allows maximal flexibility for future modifications of your new facility.

Assured Quality & Regulatory Compliance

We take great pride in our ability to supply the right quality for both the facility and for the installed systems, following all applicable quality standards and codes. At Pharmadule each project has a tailor-made quality plan. The quality plan is integrated from day one which caters for a smooth progress of the project in compliance with the quality demands.

Understanding the aspects of regulatory/ GMP compliance is something we deal with every day. We ensure that local building codes and corporate standards are followed in our design execution for every project.

Pharmadule has a well defined Quality Management System as well as ISO certified fabrication ensuring your project undergo strict monitoring and control achieveing the predictable results you expect.

Our Concept has been applied for more than 25 years

Since the start in 1986 more than 60 production facilities have been delivered worldwide using the Pharmadule modular concept. Together with hundreds of executed Conceptual and Basic Design projects we are in a unique position to take the design of your facility from the URS to the finalized facility.

With your process in mind, we guide you through the design & engineering phases to develop an optimized design for your pharmaceutical or biotech facility project. Our Design & Engineering team consists of multi skilled professionals with direct experience from pharmaceutical manufacturing, design and process technology.

Our design engineers come from all parts of the world with knowledge and experience in global design including code requirements.

Among our staff we have senior building engineers and designers, project designers and process designers as well as chief scientists and product supporting scientists from world top pharmaceutical companies.

Our experts are familiar with current design concepts and process engineering. We are able to provide you with a complete design project in compliance with FDA, EMA, WHO and SFDA cGMP.

We focus on moving quickly and effectively through the design & engineering phases ensuring that your requirements, time schedule, and budget are met.

Biopharmaceuticals

The biopharmaceutical industry is continuing to grow fast. New production technologies are emerging, giving increased yield and the need to redesign and debottleneck the manufacturing processes.

The generic part of the biopharmaceutical industry, biosimilars and biobetters, is growing rapidly. This will redefine the biopharmaceutical industry and influence facility design, size, location and project delivery time.

In this changing environment we will guide you through the process of achieving an efficient production flow, optimizing the layout and ensuring regulatory compliance for your manufacturing facility.

Our Expertise:

- Mammalian cell culture (bioreactor) processes for therapeutic proteins
- Bacterial and yeast fermentation processes and recovery operations
- Blood plasma fractionation processes

Downstream processing including:

- Membrane separation technologies, including continuous (perfusion) cell culture recovery
- Liquid chromatography operations for protein recovery and downstream purification
- Solvent based recovery and purification processes (e.g. precipitation/extraction)

- Media & Buffer prep and hold systems
- Layout optimization
- BSL Technology

Pharmaceuticals

With the growth of biopharmaceuticals more and more final product presentations are injectable solutions delivered in ampoules, vials or syringes. The injectable solutions require aseptic or sterile processing which is complex, both in terms of technology and regulatory compliance.

The majority of the final pharmaceutical products are still tablets, capsules. Increasing demand and competition for Oral Solid Dosage (OSD) products force manufacturers to optimize productivity and cost-effectiveness and product potency demands containment of the processes.

With a solid track record from designing and delivering pharmaceutical production facilities including process steps such as product formulation, vials & syringe filling and lyophilization, we can help you identify the best solutions, taking all relevant aspects into account.

Our Expertise:

- Aseptic and sterile fill and finish processes for injectable solutions in vials, ampoules and syringes
- Lyophilization of products filled in vials or syringes
- Traditional infusion solution products (IV-solutions) with liquid delivery
- Isolator/barrier technology for containment and filling operations
- Oral solid dosage including weighing, dispensing, blending, granulation, spray drying, sieving, tableting and encapsulation.
- High containment for processes of high potency products
- API production plants
- GMP Laboratories

Support Services

Any manufacturing plant needs its support systems. Regardless of if it is a biotech of final formulation plant it needs its proper supply of air, water, steam and gasses of the right quality. With our extensive experience we know how to design these support systems to ensure a smooth operation of your manufacturing.

Our Expertise:

- Process support systems such as, clean utilities, water pre-treatment, Reversed Osmosis (RO), Water for Injection (WFI), Clean Steam (CS) and Inactivation Systems.
- Washing and Sterilization, Clean in Place Systems (CIP), Steam in Place Systems (SIP) and Distribution Systems.
- HVAC design according to regulatory demands and local requirements optimizing the energy consumption to reduce the carbon footprint.
- Explosion proofing of processes and manufacturing areas.

Consumer Products

Our design & engineering services extend beyond the Life Sciences Industry and are utilized in other industries such as the cosmetic, consumer products, food & beverage and fine chemicals industries.

As an example we can provide design services covering;

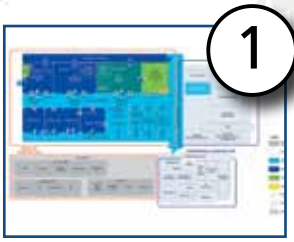
- Mixing and homogenizing process for cosmetic products (skin care products, shampoo, toothpaste, home care products)
- Processing, mixing and filling of flavors and fragrances

Our Design Process

Whether you are planning for a new production facility, upgrade of process equipment or expansion, it all starts with the design. We divide our design & engineering process into 4 steps; Feasibility Study, Conceptual Design, Basic Design and Detailed Design. We use 3D design tools to visualize the design, facilitate design reviews and clash control and to generate construction drawings.

Our design process is supported by design softwares to ensure a stringent design process, accuracy and to be able to provide state of the art solutions

We offer the complete package for a pharmaceutical or biotechnological production facility, including the feasibility study, engineering, construction, production start-up and staff training. In most cases, our support begins with the selection of process technologies and continues after project handover.

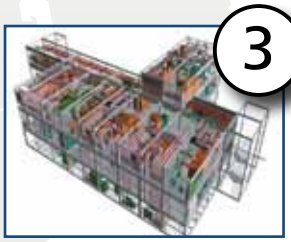


Feasibility Study

Site Development
Site Planning
Layout Development
Layout Options
Capacity Analyzes
Process Architecture
Qualification Approach
Main Equipment List
Transportation Study
Time Schedule
Price Estimate

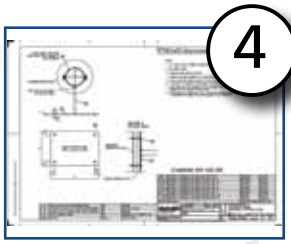
Conceptual Design

Layout Development
Room Classification
Material, Product &
Personnel Flows
Process Flow Diagram
Process Automation
Philosophy
Draft Fire Protection
Draft Qualification
Master Plan
Process & Clean Utilities
Flow Diagrams
Utility Consumption
HVAC Zoning
Time Schedule
Price Estimate



Basic Design

Finalized Layout
Room Classification
Material, Product &
Personnel Flows
Process Automation
Specifications
Long Lead Equipment
Requirement Specifications
Qualification Master Plan
Process & Clean Utilities
P&IDs
Building Design
Specifications
Site Plan
Fixed Detailed Time
Schedule
Fixed Price Proposal



Detailed Design

Construction Material
Specifications
Construction Drawings
Design Review with
3D-Design Tool
Procurement
Documentations
Project Dependent
Detailed Documents

Process Design

Starting from the URS or a high level process description we will develop Process Flow Diagrams (PFD) that depicts the manufacturing process, capacity calculations and its unit operations.

The PFDs are later developed into Process & Instrument Diagrams (P&ID) which describes in detail the process steps with all required instrumentation and utility supply. Equipment specifications are developed for each process and utility equipment included in the manufacturing process.

The process design undergoes several design reviews, both from a technical and a regulatory perspective, to ensure that the process adheres to the URS and the end users requirements.

Facility Design

In order for a facility to work effectively, the design must support all processes, interfaces and flows. A well-designed facility ensures coherent processes, efficient personnel and material flows, adequate utilities, comfortable personnel workplaces and well planned storage areas.

When you want to achieve an optimal facility design that will serve markets for many years to come, your facility will need to accommodate changing product demand, new product launches and product upgrades.

Our design approach meets your business requirements by translating these factors into facility specifications.

When planning a facility, it is important to find a partner who can hand over a facility that meets your goals in terms of time, cost and quality. Pharmadule's experience ensures that your expectations are fulfilled.

Project Management & Execution

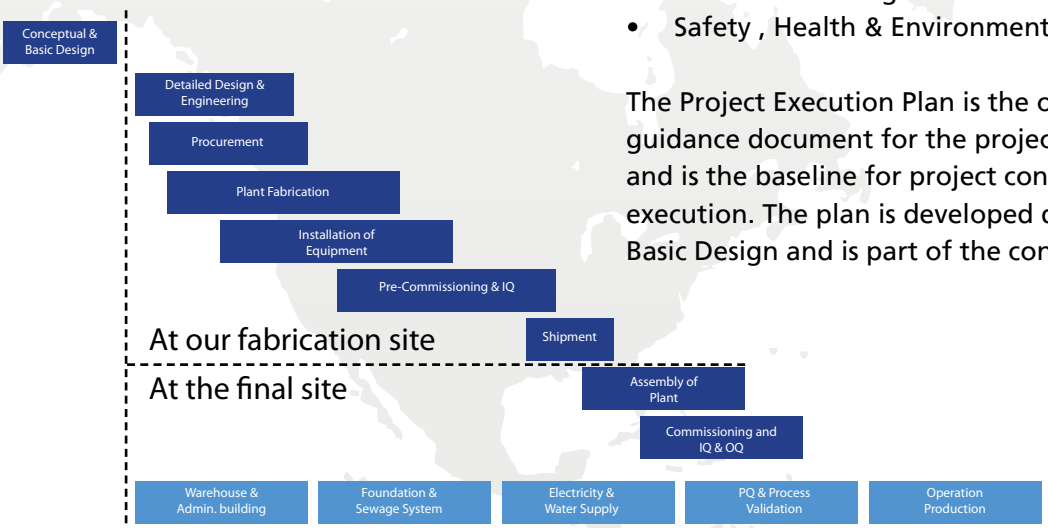
Our fast-track delivery is enabled through the use of parallel and integrated project activities.

To support this, we have a well-proven Project Management & Execution Model which is tailor-made for each project - the Project Execution Plan.

The major areas addressed in the Project Execution Plan to ensure a successful project execution are:

- Project Communication
- Organization
- Quality System and Execution Plan
- Cost Control
- Schedule Control
- Project Reporting
- Risk Management
- Document Management
- Safety , Health & Environment

The Project Execution Plan is the overall guidance document for the project team and is the baseline for project control and execution. The plan is developed during Basic Design and is part of the contract.



Health, Safety & Environment

Our HSE policies, procedures and guidelines provide clear directions regarding expectations for HSE processes and program implementation. During the Project start-up a thorough risk analysis is performed together with the client which will serve as a base for the complete project until handover. Monitoring the safety is highly important for us and our clients.

Our HSE management system is an interlinked part of our Business Management System (BMS) and based on the ISO 18001 and 14001 standards. In 2010, Merck Sharpe & Dohme in Ireland received the Construction Users Roundtable (CURT) award for the safest project executed where Pharmadule was the major supplier of that project.

Safety for all people involved in our projects is our top priorty!

All work is guided by Pharmadule´s safety policy and procedures and a Site Safety Plan and site safety organization together with the client.

Sustainable Design

Managing the environmental footprint is important to us and our customers - it's a joint effort. At Pharmadule we believe that reducing our environmental impact is consistent with our values as serving the health care industry which is dedicated to improving global health. We undertake sustainable initiatives that will impact the design, delivery and life cycle of your facility.

We have identified that energy consumption in a facility, mainly cooling in HVAC systems, is the factor that has the biggest impact in a sustainability context. As a supplier we can affect certain areas within the standards and we take steps to ensure that our delivery fits your goal to reach targeted the certification level.

Partnering with us does however not only mean energy savings within the HVAC field. The architectural surface, the materials and equipment chosen are also part of the green design initiative as well as prefabrication to a high quality and the possibility to add renewable energy sources like solar panels to the design.

Modular Facilities & Off-site Construction

Modular fabrication and off-site construction removes the critical parts of the delivery of your project from the conditions on your final site.

In a safe and controlled environment of the workshop, the process and utility equipment are integrated into the modular building obtaining a clean and efficient installation.

Our staff is specialized in fabrication of facilities for the Life Sciences and Consumer Products Industries. 75-80% of your facility is finalized in our workshop.

As part of the Morimatsu Industry Group we can supply bioreactors, vessels, CIP-skids, formulation systems and many other process systems from our own organisation.

Our approach to integrated qualification leverages our efforts in the workshop to a maximum, drastically reducing time spent on-site!

Our modular concept has been recognized as to provide our clients with:

- Faster project delivery
- Lower risk
- Predictable implementation
- Great flexibility

Design & Engineering

Modular Fabricati

Shipping & Assembly

Commissioning & Qualif

Safe Installation and Lower Risk

The use of off-site construction ensures that your facility will be built in a safe working environment.

Since the building is 75-80% ready when it leaves our production facility we have removed the hazards of building on site the conventional way. The remaining 20-25% will be performed under safe conditions at the final destination.

Pharmadule's SHE policies, procedures and guidelines provide clear direction regarding expectations for SHE processes and program implementation.

On Site Installation

The modules arrive well protected to the site and are assembled. The complete building can be set in 1-14 days depending on the size.

Qualification

The commissioning and qualification activities start immediately as the modules are being set to ensure your facility will be up and running according to the schedule.

Hand-over

When the project is completed we make a walk-through and final inspection together with the client and the as-built documentation and final documentation is handed over in the Turn Over Package (TOP).

on

Process & Utility installations

fication

Handover & Start-up

Process Equipment & Off Site Integration

As part of the Morimatsu Industry Group we are in a unique position to offer complete solutions, including process equipment, integrated into our off-site constructed modular facilities or as stand-alone process equipment, skids and modules.

This reduces the number of suppliers and makes equipment installation and testing much more efficient since it is all done in the same workshop!

Together with our sister company Shanghai Morimatsu Pharmaceuticals (SMP) we are covering a number of industries like biopharma, pharma and cosmetics and have delivered high quality products to a wide range of customers including both multinationals and local companies.

With our combined offering we can support your project in the most efficient way regardless if it's a new, green field project or installation of process equipment in an existing building.

Pharmaceutical Industry

- Media and buffer preparation systems
- Bioreactors and fermentors
- Downstream processing skids
- CIP workstation
- Formulation systems

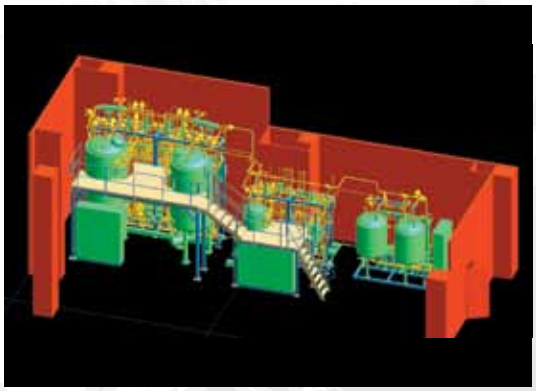
Cosmetic Industry

- Liquid processing modules
- Homogenizer systems
- Powder handling systems

Chemical Process Modular Units

Customized Modules

- Sanitary stainless steel tanks
- Sanitary shell & tube heat exchangers
- Agitation systems
- API production equipment
- Homogenizer
- Transfer panels
- Valve manifolds
- Platform assemblies



Bioengineering upstream skid

Bioengineering downstream skid

Mixing and preparation skid

CIP skid

Cosmetics mixing skid

Other customized process skid

Commissioning, Qualification and Validation Approach

The regulatory pressure on the Life Sciences Industry has led to companies performing more validation related activities than necessary to be on the safe side. Hence, the cost for validation has increased, sometimes to an unacceptable level.

In today's competitive environment there is a need to scale down and streamline without jeopardizing compliance to regulatory requirements.

Unnecessary work can be eliminated using an integrated risk based approach that fulfills GMP requirements – we do it once and we do it right.

The Lifecycle Concept

We have the unique experience from having delivered over 60 validated facilities worldwide. We know that validation needs to be planned carefully in the beginning of a project in order to manage the complex process of designing, building and validating a pharmaceutical facility. Because of this we have developed a proven validation management process that will take you from the early design phases to finalized process validation on time and budget.

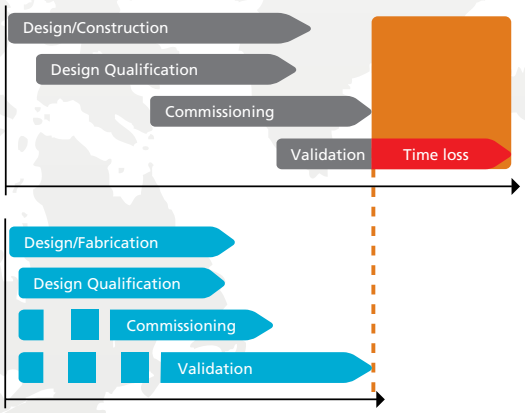
Quality Assurance in our Modular Deliveries

Our work is performed according to a Commissioning Master Plan and a Qualification Master Plan. We work according to the current Good Manufacturing Practices (cGMP) for facility design, record keeping, personnel qualifications, sanitation, cleanliness, IQ (Installation Qualification), OQ (Operational Qualification), and complaint handling. The client performs the process and cleaning validation and support is provided if requested.

There are two concepts of quality, directly or indirectly affecting the delivery of a Life Sciences project.

GMP (Good Manufacturing Practice)
- Product quality
- Manufacturing oriented
- Enforced by regulations

ISO 9000
- Process quality
- Product life cycle oriented
- Guided by an ISO-standard



Our belief is that test of systems and components should be executed based upon its criticality to the quality of the final pharmaceutical product. Our experience is that in average 2/3 of the components in Direct Impact systems are non-critical.

Through the use of off-site testing in our workshops or FAT at the vendor will minimize the risk, optimize the utilization of time and increase the quality. This is much more predictable compared to doing all testing prior to hand-over.

Commissioning of non-impact systems is executed in our workshop, construction quality (commissioning) checks are continuously executed in parallel with the construction progress. Testing will occur in our workshop or at the final site.

Classification, Risk Analysis and Control Strategy

We have adopted the “Lifecycle” structure from the FDA Process Validation guide, which is also supported by ASTM E2500, GAMP5 and ICH. Our qualification engineers will work closely together with engineering and regulatory affairs to perform system classifications and risk analysis in order to form a control strategy as basis for the Validation. Non-critical systems will be commissioned only.

Commissioning

We commission all types of systems, GMP critical as well as non-critical. The commissioning testing will start on applicable systems off-site, before they have been delivered to the final site.

The off-site testing can be Factory Acceptance Test (FAT) at a sub-suppliers workshop or commissioning tests performed at our workshop in Shanghai, such as: Receipt Verification (RV), Installation Verification (IV), Functional Testing, Check Lists (CL) and Check Records (CR).

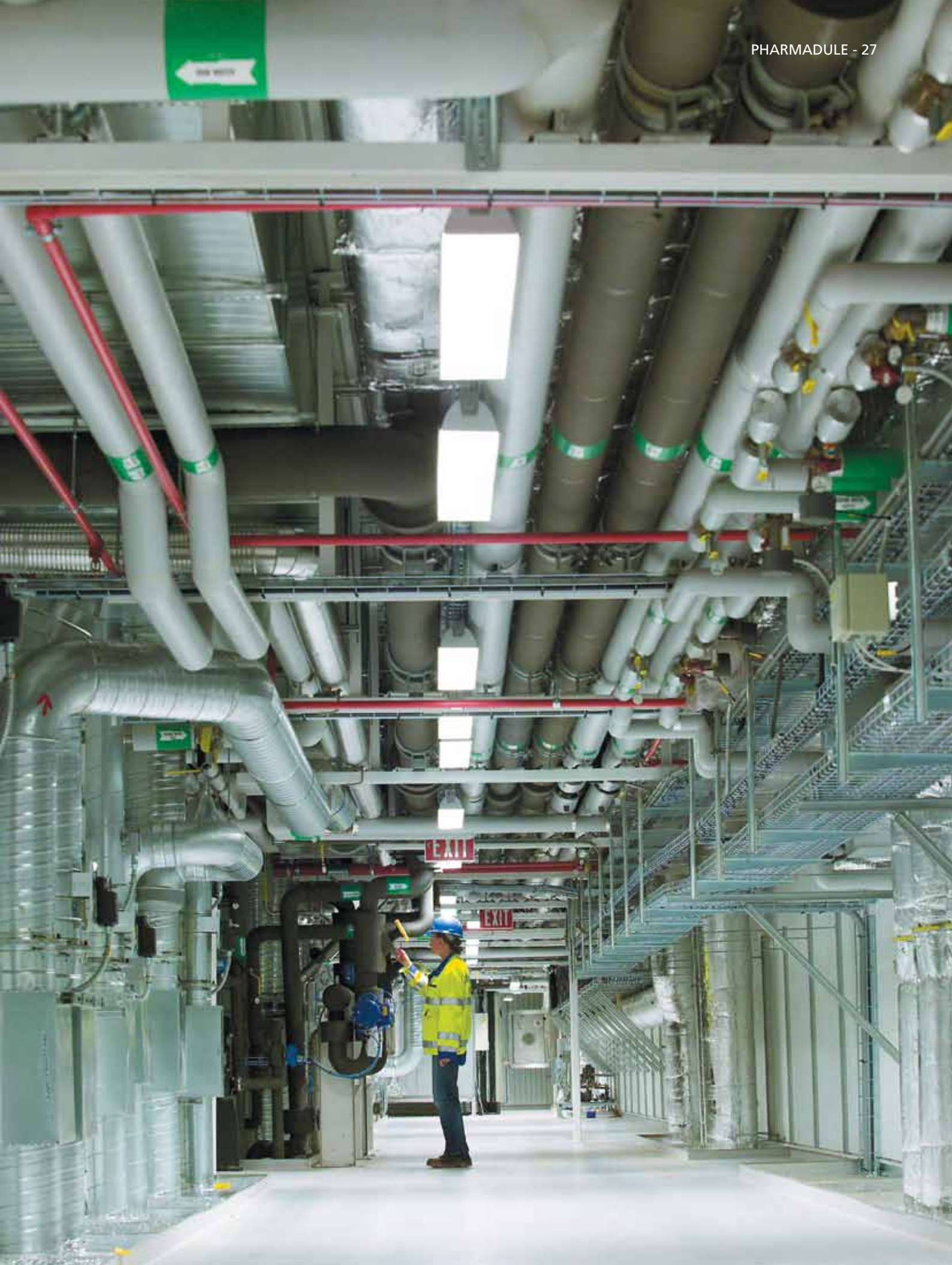
Through thorough supplier evaluations and audits we strive, in line with ASTM E2500, to leverage as much testing as possible from suppliers directly into our own commissioning and qualification.

Qualification

The critical process parameters (CPP) and the Critical Aspects of Manufacturing (CAM) will be verified during the qualification stages. Most clients still want to do this through Installation Qualification (IQ) and Operational Qualification (OQ). Our experienced team of validation engineer will plan the qualification, write the IQ and OQ-protocols and carry out the verification testing.

Validation

The Process and Cleaning Validation (PV, CV) are the main deliverables to the regulatory authorities as this is the documentation that should go into the product file for a regulatory submission. Whether the validation will consist of the traditional three batches or follow a more modern process looking at the process capability or verifying the design space, we know how to do it. We can write the protocols and supervise the validation runs.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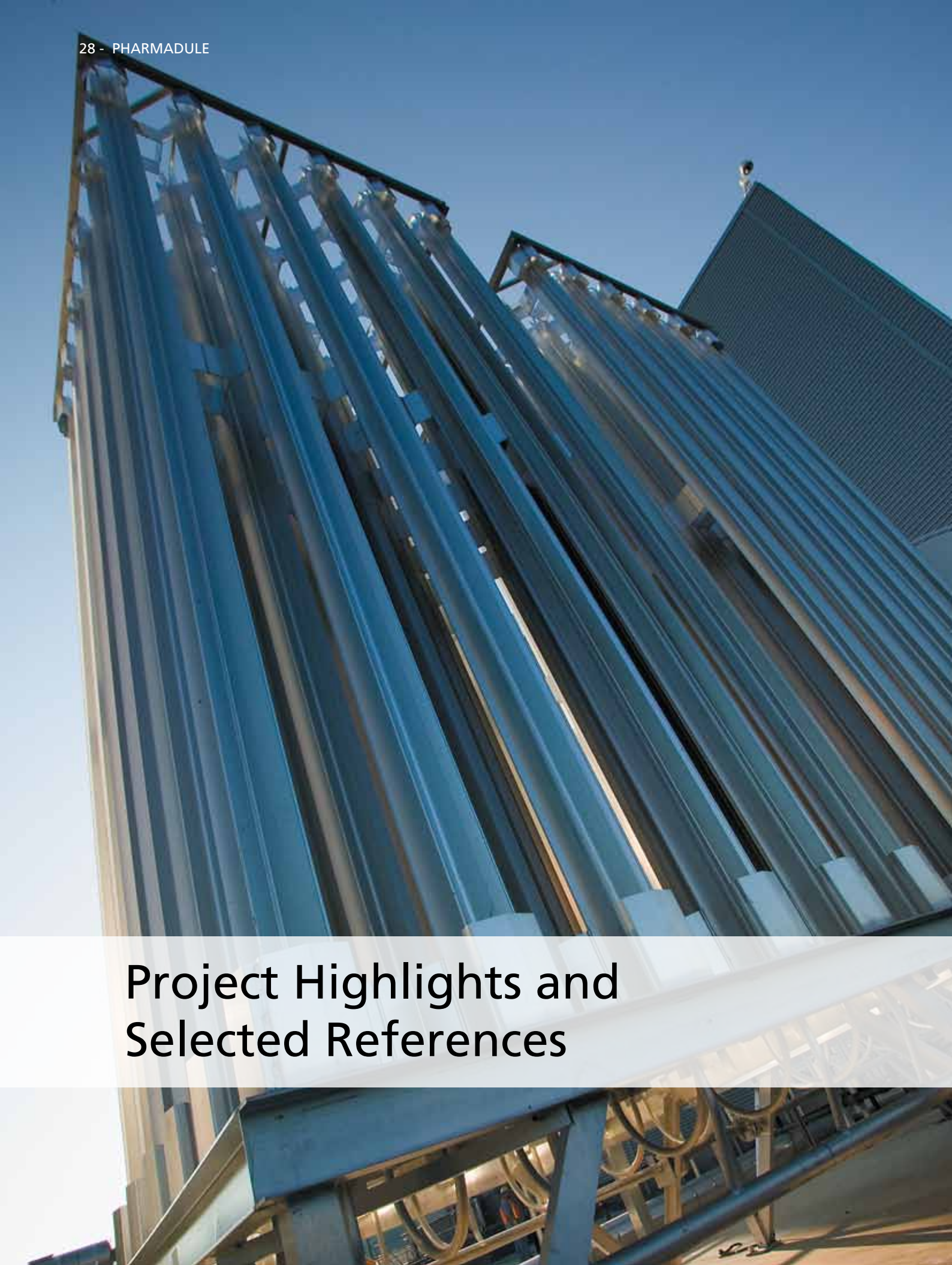


Project Highlights and Selected References

Rapid Project Deployment

A major process equipment manufacturer in Germany needed to create a separate Pharmalab unit with a clean area for development of barrier systems e.g. isolators, RABS etc.

The Pharmalab serves as an Isolation Technology Centre for customers optimizing sterilization parameters and testing materials and components. The Pharmalab is also a platform for GMP and isolator training and development of process cycles and validation services.

The main drivers for choosing Pharmadule as a partner were:

- Short delivery time (3,5 months)
- Turn Key delivery
- Clean room experience
- Minimizing disturbance at the client's site in Germany
- A construction prepared for future expansion

Project Highlights

The Pharmalab is a two module structure of 120 sqm. The lab consists of a GMP area ISO class 8, a washing and sterilization area, air locks, an office and a service area with HVAC.

The lab is frequently visited by clients and is designed for future expansion for other business areas by addition of more modules without disturbing ongoing activities.

To keep the time schedule of 3,5 months parallel activities for design, construction and installation were performed.

After the FAT at the construction site in Sweden the modules were packed and transported by road to the final site in Germany.

The modules were positioned in one day on a foundation prepared in advance during the construction time.

After hook-up of internal piping, ducts and services the lab was commissioned and handed over to the client on schedule.

Fast track & Innovative Delivery

One of the leading biopharmaceutical companies in California needed to rapidly increase capacity for one of their major products. The need was to add filling and lyophilization capacity at the existing site in San Francisco. The new facility was designed as a stand-alone, modular building, including the process and clean utility parts but also general lockers, a break room and a small storage area.

The Pharmadule scope included:

- Total building area 2 760 sqm, 50 modules.
- Total project execution 17 months (10 months in the workshop, 7 months on site, including IQ/OQ).
- Meeting the client's need of producing product for the market in time, 22 months after start of detailed design.

Project Highlights

To fully utilize the benefits of off-site construction the whole plant was pre-assembled in two blocks at the fabrication workshop.

The first block contained the support areas (lockers, offices, break room etc.). While the support part was being shipped the process part underwent testing.

Here the entire filling line was installed in the modular building. The client could perform water fills at the workshop to make sure the equipment was integrated properly, and to pave the way for a smooth qualification at the final site.

Next challenge was the lyophilizer.

With a lead time of about 15 months and a manufacturer far away from the modular workshop it was really on the critical path of the project.

In order to save time and to minimize transportations the two modules that were housing the lyophilizer and the loading system were shipped to the manufacturer.

The manufacturer integrated the lyophilizer and loading system in their workshop and performed testing.

This approach significantly reduced the delivery time and shortened the qualification efforts on the final site saving about 3 months compared to a conventional execution.

Facility of the Year Winner

Schering-Plough (Merck & Co, Inc.) contracted Pharmadule for the design, construction and commissioning of an integrated global clinical supply drug product manufacturing and packaging facility to provide capabilities needed to support Schering-Plough's growing product development pipeline.

The main drivers when working with Pharmadule as a partner were:

- Use existing facility structure where feasible
- Room & process flexibility and rapid product changeover
- Simultaneous handling of multiple batches and active ingredients
- Integration of various engineering companies and user groups.

Project Highlights

The Pharmadule delivery consisted of 4 800 sqm process and mechincal space for the process intense manufacturing part. Exisiting structure was retrofited for the non-process intensive activies.

The modular delivery was an advantage due to the off site & indoor fabrication with lower safety risks and improved quality assurance.

Open access for equipment assembly and single source approach also played an important part when adopting the Pharmadule concept.

The final quality of the facility is very high with a high degree of uniformity of finishes and installations.

In 2011 the project was awarded the "Facility of the Year - Facility Integration" award by ISPE which is a major recognition for the Pharmadule Modular Concept!

Selected projects successfully delivered using the Pharmadule

Aseptic Filling Facility (2010)

Client:	Merck & Co Inc.
Country:	Ireland (Carlow)
Size:	7 000 sqm/75 000 sqf
Production:	Vaccines

Biopharmaceutical Facility (2009)

Client:	Eli Lilly & Co
Country:	Ireland (Cork)
Size:	7 500 sqm/80 700 sqf
Production:	Biopharmaceutical products

Clinical Trials Supply Facility (2009)

Client:	Schering-Plough (Merck & Co, Inc.)
Country:	USA (NJ)
Size:	4 800 sqm/50 000 sqf
Production:	Drug production for worldwide clinical trials

Aseptic Filling Facility (2009)

Client:	Merck & Co Inc.
Country:	USA (NC)
Size:	4 000 sqm/43 000 sqf
Production:	Aseptic filling and lyophilization of vaccines in vials

Aseptic Filling Facility Expansion (2009)

Client:	AstraZeneca
Country:	China (Wuxi)
Size:	80 sqm/860 sqf
Production:	Freezedrying of aseptically filled products

Aseptic Filling Facility (2008)

Client:	Excelvision
Country:	Switzerland (Hettlingen)
Size:	714 sqm/7 700 sqf
Production:	Aseptic fill and finish of ophthalmic products

Modular Concept

Aseptic Filling Facility (2008)

Client:	GSK Biologicals
Country:	Belgium
Size:	1 500 sqm/16 150 sqf
Production:	Aseptic filling of liquid vaccine

Biopharmaceutical API Facility (2007)

Client:	GSK Biologicals
Country:	USA (Montana)
Size:	3 000 sqm/32 300 sqf
Production:	Substance for vaccines

Microbiology laboratory (2006)

Client:	Advanced Medical Optics (AMO)
Country:	Sweden (Uppsala)
Size:	752 sqm/8 100 sqf
Production:	Microbiology analyses

Aseptic Filling Facility (2006)

Client:	Genentech
Country:	USA
Size:	3 200 sqm/34 400 sqf
Production:	Lyophilized and liquid products filled in vials

Aseptic Filling Facility (2006)

Client:	Merck & Co Inc.
Country:	USA
Size:	5 700 sqm/61 300 sqf
Production:	Aseptic filling and lyophilization of vaccines in vials

Aseptic Filling Facility (2005)

Client:	Eli Lilly & Co
Country:	USA
Size:	3 800 sqm/41 000 sqf
Production:	Dry powder in vials

Selected projects successfully delivered using the Pharmadule

Biopharmaceutical API Facility (2005)

Client:	Eli Lilly & Co
Country:	USA (Indianapolis, IN)
Size:	11 400 sqm/123 000 sqf
Production:	Pilot plant clinical trials production

API Kilolab (2005)

Client:	Schwarz Pharma
Country:	Ireland
Size:	120 sqm/1 300 sqf
Production:	Process development Kilo Lab

API Facility (2005)

Client:	Eli Lilly & Co
Country:	Ireland
Size:	5000 sqm/53 800 sqf
Production:	Clean bulk manufacturing

Biopharmaceutical API Facility (2005)

Client:	Eli Lilly & Co
Country:	UK
Size:	1700 sqm/18 300 sqf
Production:	Purification plant

Aseptic Filling Facility (2005)

Client:	Baxter
Country:	USA (Bloomington, IN)
Size:	3 700 sqm/39 800 sqf
Production:	Aseptic syringe filling

Pharma Lab (2004)

Client:	Robert Bosch GmbH
Country:	Germany (Crailsheim)
Size:	120 sqm/1 300 sqf
Production:	Development and service platform for barrier systems

Modular Concept

Biopharmaceutical API Facility (2004)

Client:	Eli Lilly & Co
Country:	Puerto Rico (Carolina)
Size:	20 000 sqm/217 000 sqf
Production:	Purification plant

Solid Dosage Facility (2003)

Client:	Merck & Co Inc.
Country:	Singapore (Tuas Park)
Size:	2 200 sqm/23 700 sqf
Production:	Powder preparation

Biopharmaceutical API Facility (2002)

Client:	Biotechna (acquired by Teva)
Country:	Lithuania (Vilnius)
Size:	1 425 sqm/15 300 sqf
Production:	Bulk hormones and interferon in campaigns

Aseptic Filling Facility (2000)

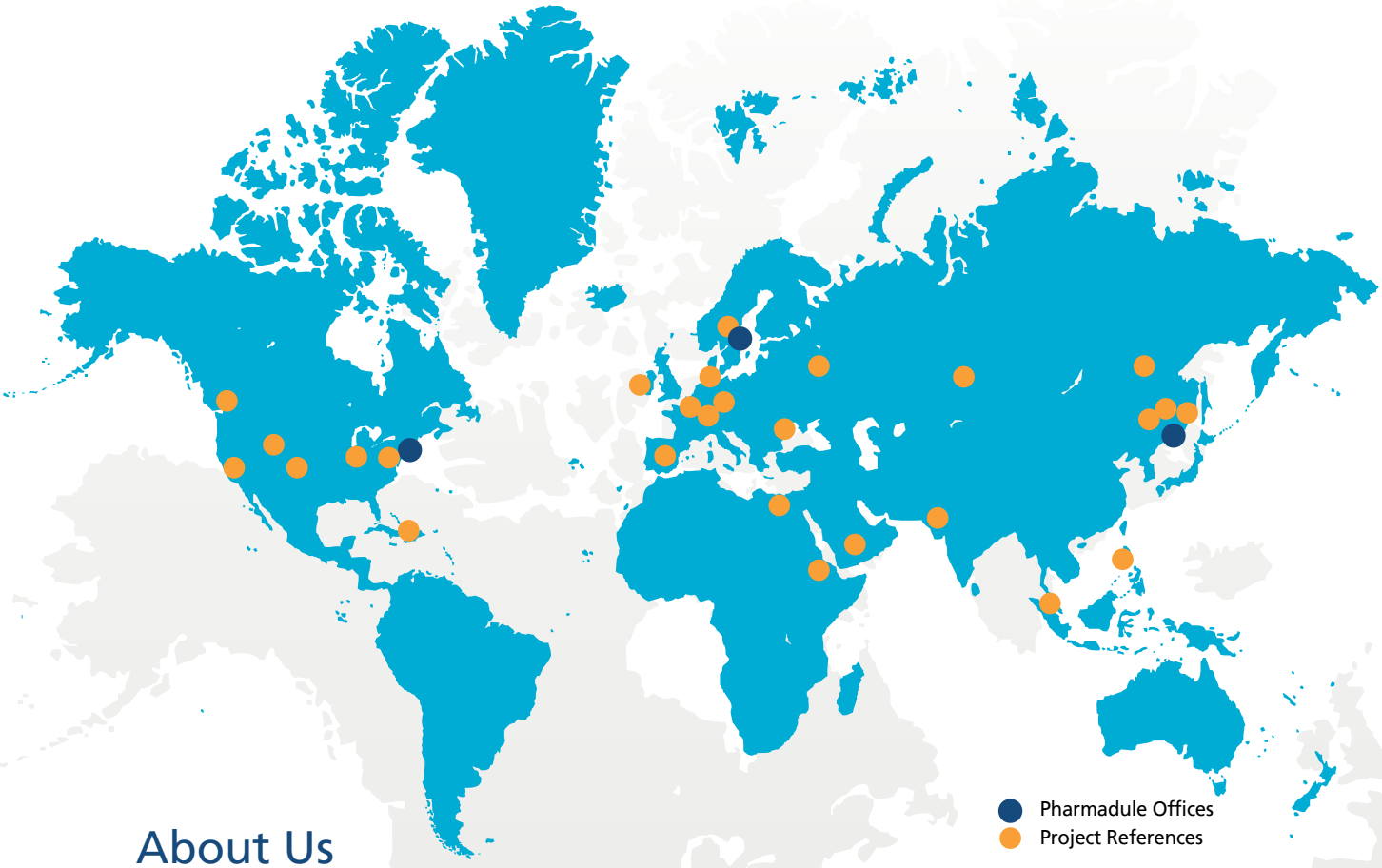
Client:	AstraZeneca
Country:	China (Wuxi)
Size:	1 200 sqm/12 900 sqf
Production:	Lyophilized products in vials. Sterilized products in vials

Solid Dosage Facility (1998+2000)

Client:	Eli Lilly & Co, Phase I & II
Country:	China (Suzhou)
Size:	768+110 sqm/8 250+1 180 sqf
Production:	Phase I: Ceclor, Cephalosporine formulated in capsules, syrups and sachets.Phase II: Ceclor cephalosporines tablets

Biopharmaceutical Facility (1999)

Client:	North China Pharmaceutical Company
Country:	China (Shijiazhuang)
Size:	1 470 sqm/15 800 sqf
Production:	Separate E-coli and mammalian cell culture production lines with filling and lyophilization in campaigns



About Us

Pharmadule was originally founded in Sweden in 1986. Since the start, more than 60 projects have been delivered using Pharmadule's modular concept. Both multinationals and local companies have benefited from our delivery method. Since 2011 Pharmadule is part of Morimatsu Industry Group, an international manufacturer of tanks, heat exchangers, process skids and modules and other industrial systems to a wide variety of industries. Today the group employs more than 5 000 persons worldwide. After the change of ownership, our company continues to strive to excel in project delivery.

We have a strong presence in Asia with engineering and manufacturing facilities in Shanghai. This makes us a perfect partner when setting up production in new markets. At the same time we can deliver very cost competitive projects to established markets.

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