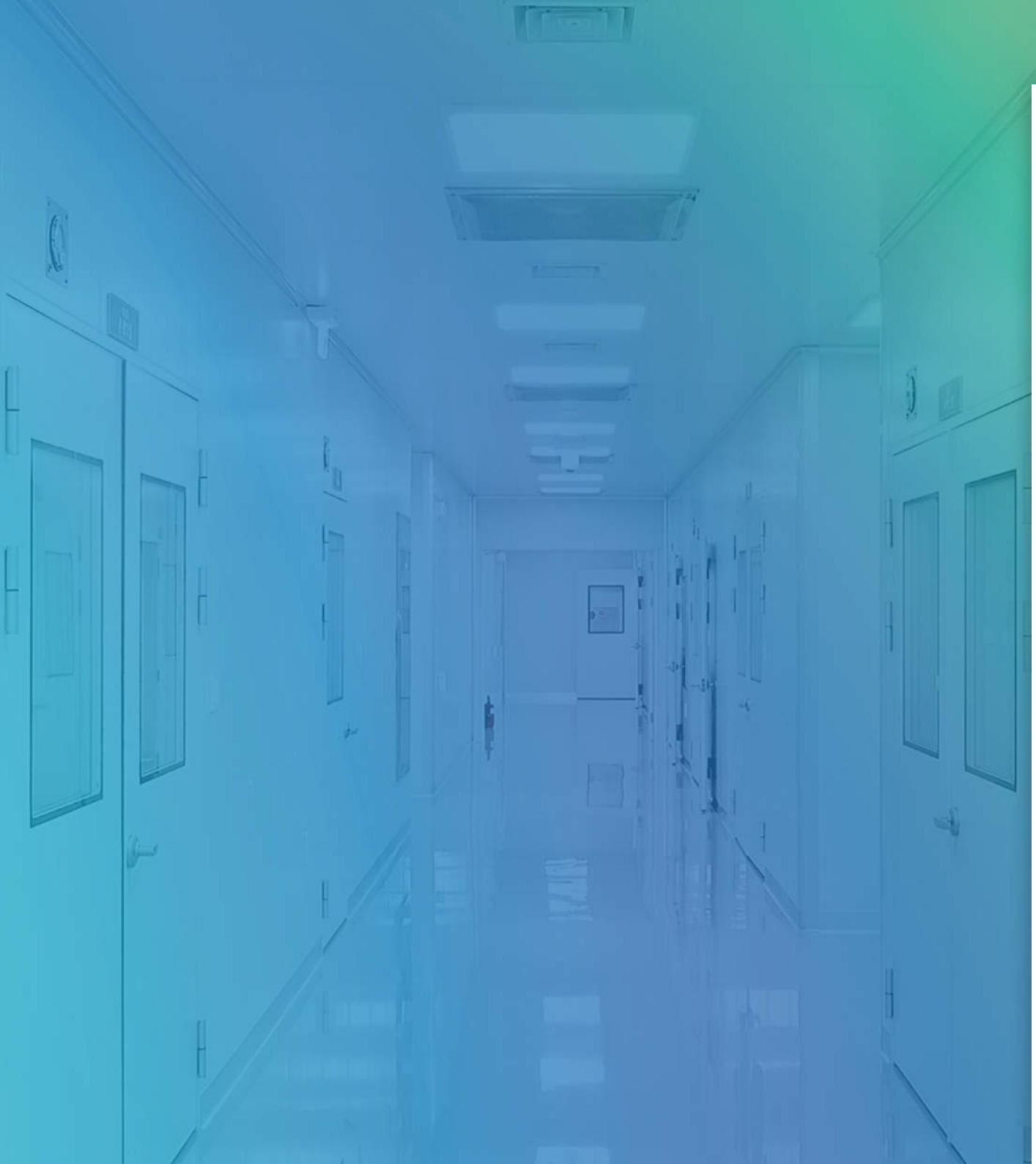
SAMYOUNG ENG

Pure Space Smart Build

CONSTRUCTION . CLEAN ROOM . GMP . HVAC . HACCP

SYENG



CONTENTS

COMPANY INTRODUCTION

Message
Philosophy
Organization
History

COMPANY STATUS

Company Status
- Company Overview
- Revenue

Registrations & Certifications
- Patents
- ISO Certificates

BUSINESS

Business Areas
Applications
Construction / Cleanrooms / Mechanical Equipment
System Diagram / 3D Modeling

PORTFOLIO

Clients / PROJECT / Project Examples
Other



Pure Space Smart Build

CONSTRUCTION . CLEAN ROOM . GMP . HVAC . HACCP

COMPANY INTRODUCTION

Message
Philosophy
Organization
History



Creates Clean Environment and
New Renewable Energy For Humans Technology

CEO Message

SAM YOUNG ENG is committed to becoming a leading cleanroom company, creating new value through continuous innovation and growth.

Dear Customers, thank you for choosing SAM YOUNG ENG.

Since 2005, SAM YOUNG ENG has designed/built cleanrooms and high-tech facilities with precise quality and reliable work beyond client expectations.

As a technology partner for clean environments, we put successful project delivery first.

SAM YOUNG ENG advances design and digitizes quality control for systematic, reliable service. Our 2D·3D design systems and digital workflows shorten construction schedules and optimize budgets.

We will keep understanding each client's spatial needs and applying our expertise to design and build tailored clean environments.

Together, our people will foster accident-free construction and build sustainable clean environments through eco-friendly methods. SAM YOUNG ENG will be your partner in building the future. We welcome your continued support.

Thank you.

SAM YOUNG ENG Co., Ltd.

Company Overview

Founded in 2005, SAM YOUNG ENG provides clean-environment technology and general construction for GMP, cleanrooms, HVAC & refrigeration, building construction and HACCP.

Our energy-saving design/build expertise and experience deliver tailored clean facilities for Korea's semiconductor, pharma, chemical and food sectors, with the technology and conditions to make the best products.

We aim to be a total cleanroom builder delivering greater client satisfaction.



Company	Founded	Head office	Employees	Services
SAM YOUNG ENG Co., Ltd.	Est. 2005	703-14 Hyundaikia-ro, Namyang-eup, Hwaseong-si, Gyeonggi-do	18	GMP, cleanrooms, HVAC/R, HACCP, general construction

MANAGEMENT PHILOSOPHY

From unseen air to lasting client value

SAM YOUNG ENG optimizes GMP, cleanrooms, plants and HVAC & refrigeration systems for pharmaceutical, food and semiconductor production, boosting client quality with sustainable technology for people and the environment.

Stronger Technology & Systems

SAM YOUNG ENG meets diverse needs promptly and precisely with optimized design and technology. We develop clean-environment systems and green products to lead sustainable facility technology.

Quality Drives Client Value

Every client is a valued partner. We build trust through quality and expertise, satisfying our people and clients alike and sharing in each client's success.

A People-First Culture

SAM YOUNG ENG puts people first, enabling everyone to participate and grow in a sustainable culture of communication and respect.

Social Responsibility

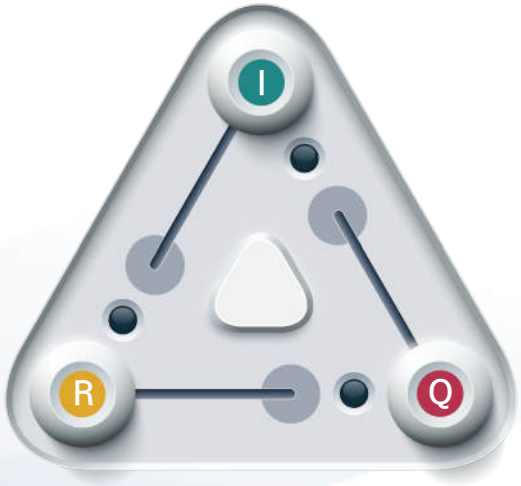
Growth is stronger when shared. SAM YOUNG ENG fulfills its social duties through giving and mutual support to build a better world.

VISION

Core Values

Integrity

Keeping promises with integrity; lasting partnerships built on trust



Responsibility

Energy- and space-efficient design supporting clients' long-term growth

Quality

Quality first throughout construction for outstanding results

Core Competencies

Clean Environment Design

Tailored GMP, HACCP and cleanroom design/build to industry standards

Technology-Driven Design

Precise design with CAD automation, standard drawings and build simulation

Integrated Project Management

Turn-Key solutions covering design, construction and maintenance

Management Policy

Safety & Health Policy

SAM YOUNG ENG puts every employee's life and health first. We apply these principles to create safe, accident-free workplaces.

Safe Workplaces

◎ Safe working conditions for everyone
◎ Prevent accidents through routine and ad hoc hazard checks

Structured Training

◎ Annual safety & health policy briefing and regular training
◎ Structured mandatory safety and health training for all staff

Preventive Health Management

◎ Make hazard recognition and prevention routine
◎ Improve worker welfare through varied health programs

Ongoing Performance Management

◎ Keep injury rates below the industry average
◎ Company-wide drive for accident-free workplaces

ORGANIZATION CHART

SYENG

- Auditor
- Board of Directors

Administration

Accounting . Administration

Planning . Bidding

Purchasing . Legal affairs

Technical Sales

Specialty Construction Division
(mechanical equipment works)

Cleanroom Division (pharma,
food, semiconductors, etc.)

Consulting Division
(GMP/HACCP, etc.)

Design

New build/remodel design

Cleanroom design

HVAC design

Utility design

IQ, OQ / T.A.B

Construction

General building construction

GMP cleanroom construction
. AHU fabrication & install
. Chiller fabrication & install
. Ductwork
(HVAC, supply air, exhaust,
dust collection)
. Interior building works
. Utility service & piping
. Auto control setup & operation
. Other works

Cleanroom & mechanical
after-sales service

Safety Management

Safety & health advice/guidance
. Safety & health organization
. Site manager assignment
. Job training and statutory training
. Safety & health budget oversight
. Risk assessment supervision and
communication system

HISTORY







2006

- ISO 9001:2000 certified
- Factory registered (AHU manufacturing)
- Mechanical works registered (Siheung-07-12-02)

2005

- SAM YOUNG ENG Co., Ltd. founded

2009

- Named a 2009 Gyeonggi Promising SME

2008

- Chiller manufacturing registered (No.2010-1)
- Venture business certified (SBC)
- Won the 13th Gyeonggi SME Grand Prize

2012

- Patent: 3-stage cascade heat pump

2010

- Relocated to new HQ/factory in Hwaseong









2015

· Exemplary Entrepreneur commendation (Gyeonggi Governor)

2014

· ISO 14001:2004 certified

2017

· Patent: ESS-linked energy-saving HVAC

2016

· Patent: Free Cooling System

· Patent: soundproof-member cooling tower

· Strong SME certified (Minister of Employment and Labor)

2019

· INNOBIZ technology-innovative SME certified

· Job creation commendation (Gyeonggi Governor)

2018

· ISO 14001:2015 certification renewed

2022

· Won the 9th Edaily Global Healthcare Grand Prize

2021

· Building construction license (10-3626)

2020

· ISO 45001:2018 certified

· Won the 2020 Edaily Clean Environment Grand Prize



Cleanroom & Architecture Total Solution Builder

CONSTRUCTION . CLEAN ROOM . GMP . HVAC . HACCP

COMPANY STATUS

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Company Status

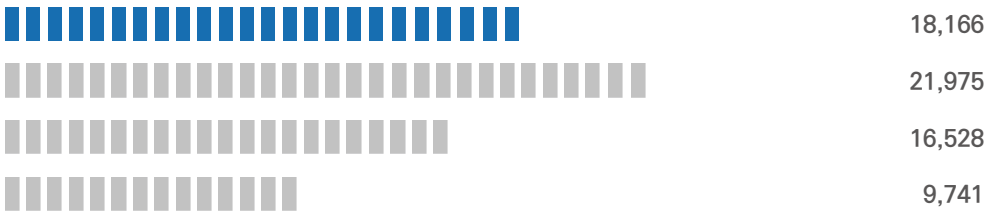
Company Overview

SAM YOUNG ENG Co., Ltd.

Founded: 2005
Address: 703-14 Hyundaikia-ro, Namyang-eup, Hwaseong-si, Gyeonggi-do
Contact: Tel. 031-355-3315

Revenue

Unit: KRW million



2024	18,166
2023	21,975
2022	16,528
2021	9,741

Construction Capacity

Unit: KRW million

Capacity (mechanical)	5,712
Capacity (building)	7,233

Patent



발급번호 : 2-5-2016-023640865

특허증

CERTIFICATE OF PATENT

특 허 제 10-0446952 호
Patent Number

출원번호 Application Number 제 10-2004-0030732 호
출 원 일 Filing Date 2004년 04월 30일
등 록 일 Registration Date 2004년 08월 24일

발명의명칭 Title of the Invention
냉각팁용 방음부재 및 이를 이용한 냉각팁

특허권자 Patentee
주식회사 삼영이엔지(131311-*******)
경기도 화성시 현대기아로 703-14 (북양동)

발명자 Inventor
등록사항란에 기재

위의 발명은 「특허법」에 따라 특허등록원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Patent Act, a patent for the invention has been registered at th e Korean Intellectual Property Office.

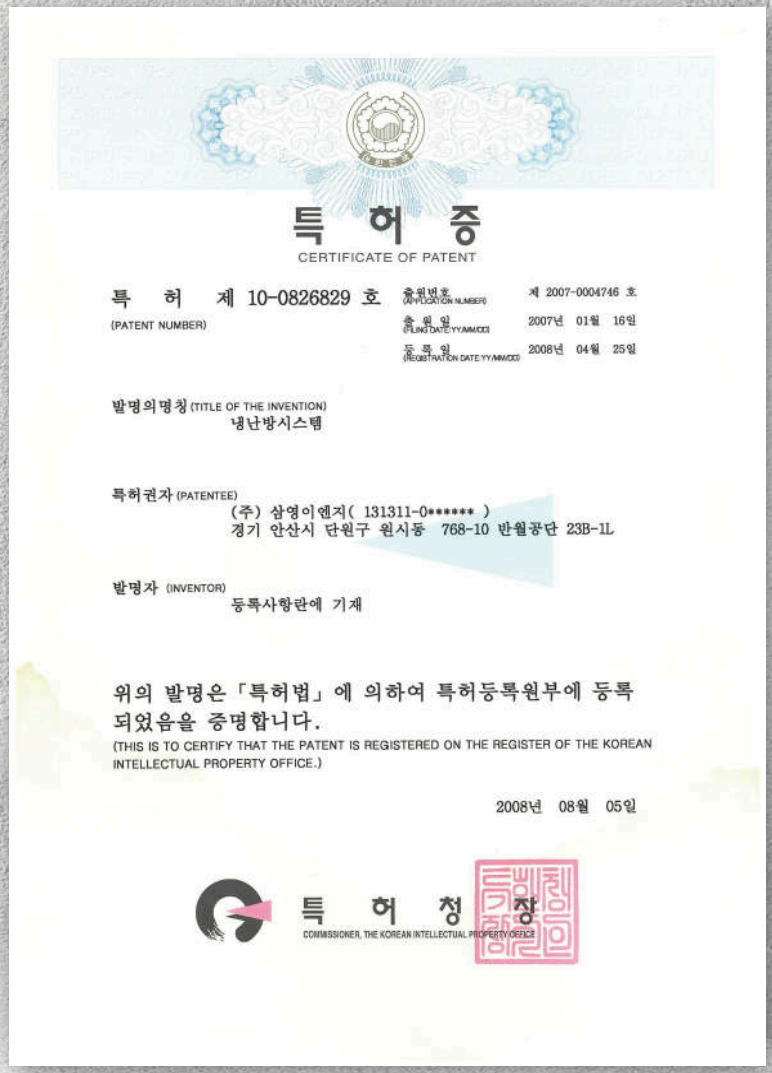
2016년 03월 25일

특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE

최 동 규

발급일자 : 20160325 1/2

Patent



특 허 증

CERTIFICATE OF PATENT

특 허 제 10-0826829 호
(PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2007-0004746 호
출 원 일 (FILING DATE:YY/MM/DD) 2007년 01월 16일
등 록 일 (REGISTRATION DATE:YY/MM/DD) 2008년 04월 25일

발명의명칭 (TITLE OF THE INVENTION)
냉난방시스템

특허권자 (PATENTEE)
(주) 삼영이엔지(131311-0******)
경기 안산시 단원구 원시동 768-10 반월공단 23B-1L

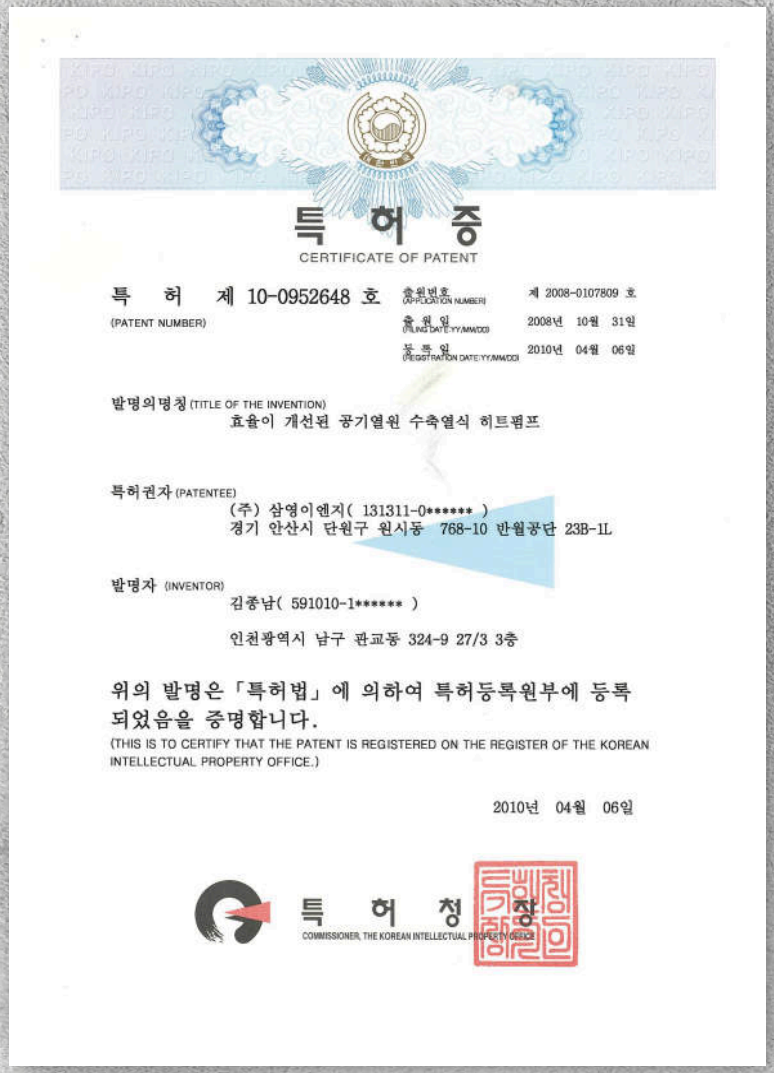
발명자 (INVENTOR)
등록사항란에 기재

위의 발명은「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.
(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2008년 08월 05일

특 허 청 장
COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

Patent



특 허 증

CERTIFICATE OF PATENT

특 허 제 10-0952648 호 (PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2008-0107809 호

출 원 일 (FILING DATE:YY/MM/DD) 2008년 10월 31일

등 록 일 (REGISTRATION DATE:YY/MM/DD) 2010년 04월 06일

발명의명칭 (TITLE OF THE INVENTION)

효율이 개선된 공기열원 수축열식 히트펌프

특허권자 (PATENTEE)

(주) 삼영이엔지(131311-0******)

경기 안산시 단원구 원시동 768-10 반월공단 23B-1L

발명자 (INVENTOR)

김종남(591010-1******)

인천광역시 남구 관교동 324-9 27/3 3층

위의 발명은「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.

(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2010년 04월 06일

특 허 청 장

COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

Patent



특허증
CERTIFICATE OF PATENT

특 허 제 10-2176850 호
Patent Number

출원번호 제 10-2020-0091555 호
Application Number
출원일 2020년 07월 23일
Filing Date
등록일 2020년 11월 04일
Registration Date

발명의 명칭 Title of the Invention
에너지저장시설용 온습도와 분진 및 환기 조절을 위한 공조시스템

특허권자 Patentee
(주) 삼영이엔지(131311-*******)
경기도 화성시 현대기아로 703-14 (북양동)

발명자 Inventor
권영묵(560903-*******)
경기도 수원시 영통구 매탄로126번길 66 주공그린빌 206-1201호

위의 발명은 「특허법」에 따라 특허등록원부에 등록되었음을 증명합니다.
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특허청
Korean Intellectual Property Office

2020년 11월 04일

QR코드로 현재기준 등록사항을 확인하세요

특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE
김 용 래

Patent



특허증
CERTIFICATE OF PATENT

특 허 제 10-2489698 호
Patent Number

출원번호 제 10-2022-0034889 호
Application Number
출원일 2022년 03월 21일
Filing Date
등록일 2023년 01월 13일
Registration Date

발명의 명칭 Title of the Invention
항온항습장치

특허권자 Patentee
(주)삼영이엔지(131311-*******)
경기도 화성시 현대기아로 703-14 (북양동)

발명자 Inventor
권영묵(560903-*******)
경기도 수원시 영통구 매탄로 126번길 66, 주공그린빌 206-1201호

위의 발명은 「특허법」에 따라 특허원부에 등록되었음을 증명합니다.
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특허청
Korean Intellectual Property Office

2023년 01월 13일

QR코드로 현재기준 등록사항을 확인하세요

특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE
이 인 실

ISO Certificate



Quality Certified

Certificate of Registration

㈜삼영이엔지

경기도 화성시 남양읍 현대기아로 703-14

operates a

Quality Management System

which complies with the requirements of:

ISO 9001:2015

이 등록은 냉동 공조 장비(물-물 지열 열펌프 포함) 및 클린룸의 설계, 제조, 설치 및 부가서비스를 포함한다.

인증번호: K0331-QC
현재 인증 승인일: 2024 년 4 월 3 일
인증서 발행일: 2024 년 4 월 3 일

최초 인증일: 2006 년 5 월 17 일
만기일: 2027 년 4 월 6 일

Sean Bates
Accreditation Manager
TQCS International (Group) Pty Ltd
For the TQCSI Certification Approval Panel

Ji-Hyun Kim
President
TQCS International (Group) Pty Ltd
Korea

This certificate verifies the original certificate issued and is valid as long as it is displayed as an electronic copy at www.tqcsi.com and surveillance audits are satisfactorily completed. TQCSI International Pty Ltd (ABN 59 065 953 924) of Quality House, 117A Tapleys Hill Road, Hendon, SA, 5014, Australia issues certification subject to the TQCSI Rules of Certification.

TQCS International Pty Ltd www.aacb.com.au www.iaf.nu www.jas-anz.org/register

ISO Certificate



Environmentally Certified

Certificate of Registration

㈜삼영이엔지

경기도 화성시 남양읍 현대기아로 703-14

operates an

Environmental Management System

which complies with the requirements of:

ISO 14001:2015

이 등록은 냉동 공조 장비(물-물 지열 열펌프 포함) 및 클린룸의 설계, 제조, 설치 및 부가서비스를 포함한다.

인증번호: K0331-EC
현재 인증 승인일: 2024 년 4 월 3 일
인증서 발행일: 2024 년 4 월 3 일

최초 인증일: 2014 년 3 월 31 일
만기일: 2027 년 4 월 6 일

Sean Bates
Accreditation Manager
TQCS International (Group) Pty Ltd
For the TQCSI Certification Approval Panel

Ji-Hyun Kim
President
TQCS International (Group) Pty Ltd
Korea

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TQCS International Pty Ltd www.aacb.com.au www.iaf.nu www.jas-anz.org/register

Cleanroom & Architecture Total Solution Builder

CONSTRUCTION . CLEAN ROOM . GMP . HVAC . HACCP

BUSINESS

Business Areas

Applications

Construction

Cleanroom

Mechanical Equipment

System Diagram / 3D Modeling

Business Areas



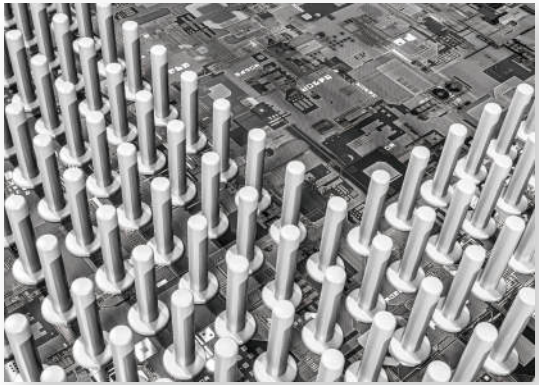
Building Construction



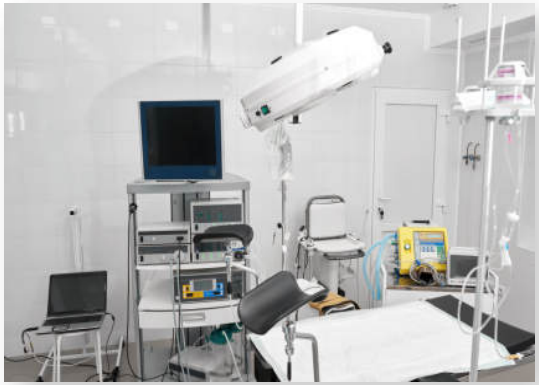
GMP Cleanroom



HACCP Cleanroom



ICR (Industrial) Cleanroom



BCR (Bio) Cleanroom



Mechanical Equipment

Applications



Building Construction
New/Expanded GMP Plants

Offices
HVAC Systems

Logistics Centers
Freezing / Refrigeration

Education, Research
HVAC

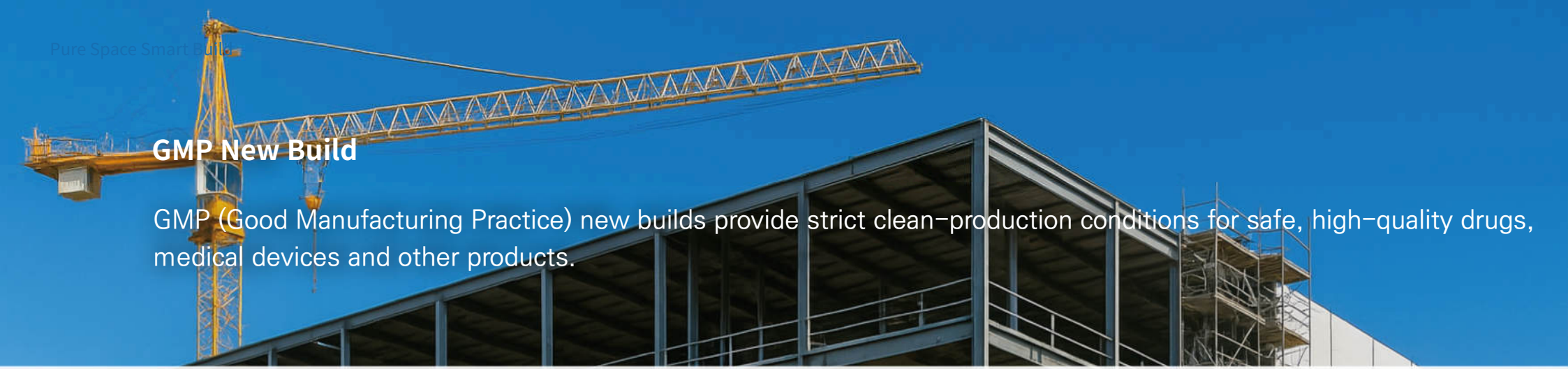
Manufacturing Sites
Cleanroom Systems

Hotels, Restaurants
HVAC / Cooling

Hospitals, Pharma
GMP Systems

Food Plants
HACCP Systems

SAM YOUNG ENG creates comfortable environments through experience and expertise. We put client trust first and strive for optimal solutions.



GMP New Build

GMP (Good Manufacturing Practice) new builds provide strict clean-production conditions for safe, high-quality drugs, medical devices and other products.

GMP new builds prevent contamination and quality loss, creating production environments that meet international standards.

Main Scope |

Site preparation, foundations and structural works

Cleanroom fit-out by grade; HVAC/ventilation with HEPA/ULPA filters

Electrical, fire protection, utilities, air showers, pass boxes and ancillary systems

Post-completion cleanliness and performance tests; GMP certification support

Category	Main Details
Structural Works	Steel/reinforced concrete; seismic/load design; level floors
Interior Works	Class-specific wall/ceiling/floor finishes; contamination control; sterile/dust-free materials
Mechanical & Electrical Works	HVAC, HEPA/ULPA filters, temperature/humidity/pressure control, electrical, fire protection, utilities
Ancillary Systems	Air showers, pass boxes, access control, clean lockers, automatic doors
Tests & Certification	Cleanliness, microbial and particle tests; GMP grade certification support
New Build Considerations	Class-specific design/build, energy efficiency, easy maintenance, regulatory/certification compliance, contamination prevention and safety



GMP Extension / Remodeling

GMP (Good Manufacturing Practice) extensions/remodeling improve structures and systems for cleaner, higher-capacity, efficient production.

GMP extensions/remodeling expand cleanrooms/systems to boost quality and output and adapt to new products and growing demand.

Main Scope |

Integrated design and extension of existing structures

Higher cleanroom class or larger area / HVAC, ventilation, electrical and utility expansion and upgrades

Better production flows and contamination barriers / Contamination prevention and safety during construction

Integrated performance tests after completion; GMP recertification support

Category	Main Details
Structural Works	Integration with existing structures; seismic/load reinforcement; level floors
Interior Works	Class-specific wall/ceiling/floor finishes; contamination control; sterile/dust-free materials
Mechanical & Electrical Works	HVAC, HEPA/ULPA filters, temperature/humidity/pressure control, electrical, fire protection, utilities
Ancillary Systems	Air showers, pass boxes, access control, clean lockers, automatic doors
Tests & Certification	Cleanliness, microbial and particle tests; GMP grade certification support
Extension Considerations	Existing plant integration/expansion, site contamination control/safety, energy efficiency, easy maintenance, code/certification compliance



Cold Storage

Cold storage is designed/built to keep fresh food, drugs, chemicals and other temperature-sensitive goods safely at low temperatures.

Cold storage preserves freshness and quality over time, minimizing losses from temperature changes during distribution and logistics.

Main Scope | Insulated walls/floors/ceilings and airtight sealing / Low-temperature refrigeration systems (chillers, refrigeration units, dehumidifiers) Automatic temperature/humidity control and monitoring / Doors, docking systems and air curtains to limit outside heat transfer Electrical, lighting, fire protection, drainage and ancillary works

Category	Main Details & Features
Structural Works	- Steel/reinforced concrete; seismic/load design; level floors and load distribution; condensation/moisture prevention
Insulation & Airtightness	- High-performance wall/ceiling/floor insulation; sealed joints; thermal bridge prevention; airtight doors
Freezing & Refrigeration	- Chillers, refrigeration units and dehumidifiers; automatic temperature/humidity control; backup systems
Hygiene & Finishes	- Stain-resistant finishes (epoxy, stainless steel); rounded corners for easy cleaning; floor drainage and slopes
Ancillary Systems	- Air curtains, PVC strip curtains, doors/docking systems; hygiene zones with handwash stations and gowning rooms
Ventilation & Drainage	- Air circulation/odor exhaust; floor trenches and backflow-proof drains; insect/rodent barriers (screens, seals)
Automation & Monitoring	- Live temperature/humidity/door monitoring; alarms, remote control and history logs

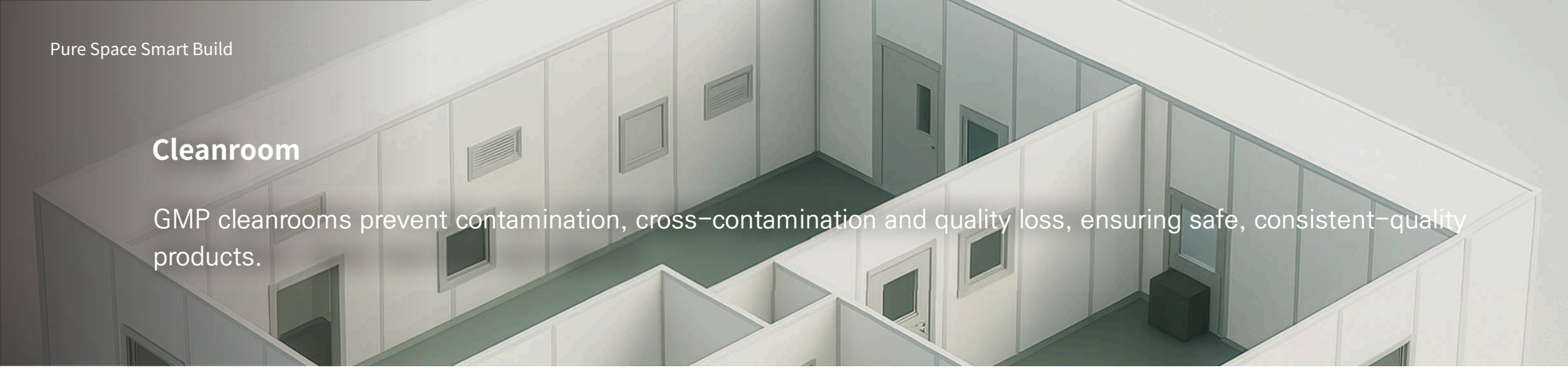


Materials / Hazardous Materials Storage

Materials storage prevents loss, damage and contamination and controls stock. Hazardous storage safely holds flammable/explosive goods to legal standards, preventing accidents and protecting workers and the environment.

Both require suitable structures, ventilation, security and safety systems to ensure productivity and safety.

Category	Materials Storage Features	Hazardous Storage Features
Structural Works	- Standard steel/reinforced concrete - Load/seismic design - Level floors	- Fire/blast-resistant structure - Segregated hazardous goods - Oil-retaining/explosion-proof floors
Interiors / Finishes	- Dust/moisture-resistant finishes - Segregated materials; first-in, first-out flow - Easy-clean finishes	- Fire/chemical-resistant finishes - Segregation by hazard type - Leakproof finishes
Mechanical & Electrical Works	- Ventilation and temperature/humidity control - Lighting, electrical, CCTV, access control	- Forced ventilation and leak detection - Explosion-proof electrical/lighting - Alarms and firefighting systems
Security / Safety	- Access control - CCTV and security systems	- Access control and hazard warning signs - Escape routes and alarms - Firefighting/disaster prevention systems
Other	- Inventory control (first-in, first-out, barcodes) - Storage racks, pallets and related equipment	- Compliant hazardous goods containers - Statutory separation and capacity limits - Applicable laws and certifications



Cleanroom

GMP cleanrooms prevent contamination, cross-contamination and quality loss, ensuring safe, consistent-quality products.

GMP cleanrooms limit contamination through strict particle, microbe, temperature, humidity and pressure control. Managed personnel/material/equipment access and procedures maintain sterile, clean conditions.

Category	Main Details
Cleanliness Grades	A, B, C, D have different particle, microbial and air-change limits
Environmental Control	HEPA filtration, precise temperature/humidity/pressure control, regular monitoring
Structure & Systems	Easy-clean, contamination-resistant walls/ceilings/floors; Air Shower·Pass Box barriers
Personnel Control	Class-specific sterile/dust-free garments, access procedures and hygiene training
Documentation & Records	Standardized records for all operations/environmental controls to support GMP compliance and quality assurance

Product quality and safety: Prevent microbial and foreign-matter contamination of sensitive pharmaceuticals and medical devices.
Standards compliance: Enable manufacturing environments meeting domestic and international requirements, including FDA and ISO 13485.
Process consistency: Systematic temperature, humidity and pressure control maintains consistent production quality.



Cleanroom GRADE

Cleanroom grades A, B, C, D differ in airborne particle, microbial and air-change limits. The grade suits the application and work environment to ensure sterility and quality.

Grade	CLASS	Applicable Rooms (examples)	Design Conditions	Air Changes	Particle Limits	Microbial Limits	Garments
					0.5㎛/m³ 5.0㎛/m³	Airborne cfu/m² Settling cfu/4hr	
A	100	-Aseptic workbench -Sterile filling/sealing	-Unidirectional airflow - CLEAN BENCH/BOOTH - HEPA FILTER - Vertical: 0.3m/sec, horizontal: 0.45m/sec	600/hr or more	3,520 / 20 (Same in operation/at rest)	1 / 1	Sterile garments
B	10,000	-Sterile product room -Aseptic gowning/preparation room	-Non-unidirectional airflow - PRE+MED+HEPA FILTER -Positive pressure (10~15Pa)	20/hr or more	At rest:3,520 / 29 In operation: 352,000 / 2,900	10 / 5	Sterile garments
C	100,000	-Container washing room -Final sterile product wash/storage room -Critical nonsterile product room	-Non-unidirectional airflow - PRE+MED+HEPA FILTER -Positive pressure (10~15Pa) -Temperature/humidity control	10/hr or more	At rest:352,000 / 2,900 In operation: 3,520,000 / 290,000	100 / 50	Sterile garments
D	-	-Area linked to C zone -Dust-free gowning	- PRE FILTER -Temperature/humidity control -Ventilation	-	At rest:3,520,000 / 290,000	200 / 100	Dust-free garments

** Particle limits: max. particles ≥0.5㎛ / ≥5.0㎛ per m³ (in operation / at rest) | ** Microbial limits: airborne (per 1m²), settling (Ø90mm plate, 4 h)

** Air changes: minimum per hour | ** Design conditions: filters, airflow, pressure, temp./humidity



HACCP Cleanroom

Designed/operated to HACCP principles, these spaces limit contamination and maintain clean production. They protect food safety/quality, meet legal/international hygiene standards and build trust.

HACCP cleanrooms serve food manufacturing, meat, dairy and seafood processing, catering and restaurants.

Category	Heating/sanitizing required before primary packaging	Heating/sanitizing required after primary packaging	No heating/sanitizing required throughout the process
Clean Zone	-Exposed-food processing areas after heating -Primary packaging area	-Manufacturing/processing areas handling exposed food -Primary packaging area	-Manufacturing/processing areas handling exposed food -Primary packaging area
Semi-Clean Zone	-Areas with heat processes	-Exposed-food areas excluding pretreatment	-Exposed-food areas excluding pretreatment
General Zone	-Areas handling primary-packaged food -Pretreatment area	-Areas handling primary-packaged food -Pretreatment area	-Areas handling primary-packaged food -Pretreatment area
Workplace Zoning	Locate away from contamination sources / Prevent dust and insects from entering Keep surroundings clean / Separate clean and general zones with walls or barriers to prevent cross-contamination		

HACCP supports product safety, hygiene and quality trust; domestic/international HACCP, ISO 22000 and legal compliance; efficient production; and reduced contamination and defects.



ICR (Industrial) Cleanroom

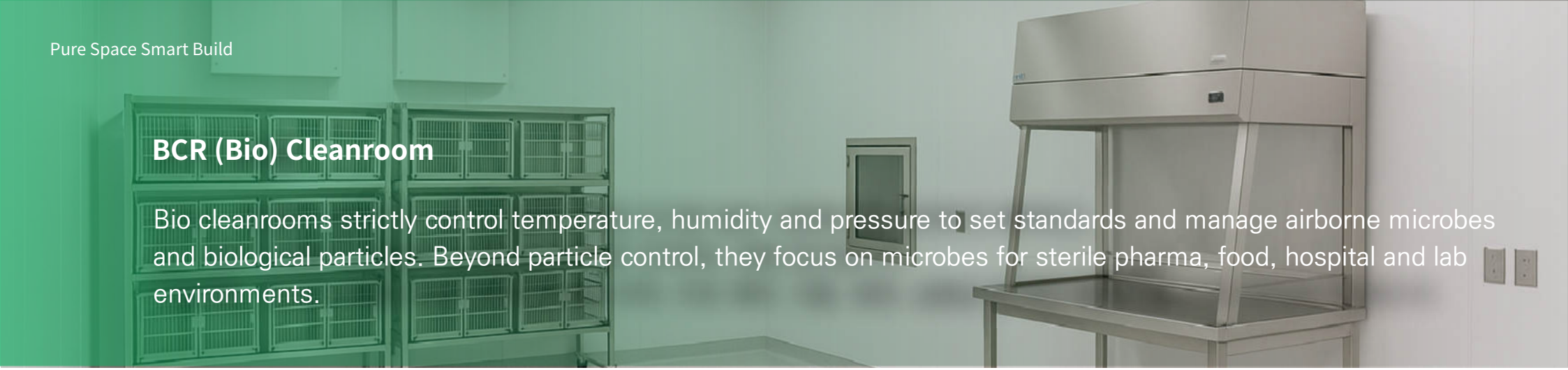
Industrial cleanrooms strictly control airborne particles for product quality and reliability, plus temperature, humidity and pressure, serving electronics, semiconductors, precision machinery and aviation.

Features & Control Standards

Category	Main Details
Cleanliness Class	Class 1~9 under ISO 14644-1 (formerly US Federal Standard 209D), based mainly on 0.1~5㎛ particle counts
Particle Control	HEPA/ULPA filtration removes particles; air circulation and ventilation systems
Environmental Control	Precise temperature, humidity and pressure control/monitoring
Structure / Systems	Smooth walls/ceilings/floors; Air Shower, Pass Box and other contamination barriers
Industries	Semiconductors, displays, precision electronics, machinery, aviation, auto parts

Cleanliness Grades (ISO 14644-1) Lower class numbers mean higher cleanliness

ISO Class	0.1㎛ particles (count/m³)	0.5㎛ particles (count/m³)	5.0㎛ particles (count/m³)	Applications
Class 1	10	-	-	Ultra-precision semiconductors
Class 5	100000	3520	29	Semiconductors, precision electronics
Class 7	-	352000	2930	General electronics, machinery
Class 8	-	3520000	29300	Packaging, storage



BCR (Bio) Cleanroom

Bio cleanrooms strictly control temperature, humidity and pressure to set standards and manage airborne microbes and biological particles. Beyond particle control, they focus on microbes for sterile pharma, food, hospital and lab environments.

Features & Control Standards

Category	Main Details
Microbial Control	HEPA/ULPA filters and UV/sterilization systems control microbes and biological particles
Environmental Control	Precise temperature/humidity/pressure control; rapid contaminant exhaust; vertical laminar/turbulent flow
Structure & Finishes	Stain/moisture-resistant materials (epoxy, stainless steel); rounded corners; sealed joints
Contamination Barriers	Air Shower, Pass Box entrance barriers and access control

Cleanroom Grades by Dosage Form: Examples

Dosage Form	Typical Cleanroom Grade	Main Processes
Sterile Injectables	Grade A/B (ISO 5/7)	Mixing, filtration, filling, sealing
Tablets / Capsules	Grade C/D (ISO 7/8)	Mixing, granulation, compression, packaging
Ointments / Creams	Grade C/D (ISO 7/8)	Mixing, filling, packaging
Syrups / Liquids	Grade C/D (ISO 7/8)	Mixing, filtration, filling, packaging
Biologics	Grade A/B (ISO 5/7)	Cell culture, aseptic filling

Mechanical Equipment

Panel Works

Panel works ensure cleanliness, airtightness, hygiene and durability in cleanroom/GMP facilities. Wall, ceiling and partition panels block external contaminants and maintain stable conditions. Modular on-site assembly improves efficiency and eases maintenance.

Panel Materials & Features

Material	Main Features & Uses
Urethane Panel	Urethane foam between steel skins; insulated, airtight, lightweight; widely used, easy and economical to install
EPS Panel	Flame-retardant EPS core; economical and insulating; mainly used for cost-saving walls
Glass Wool Panel	Glass wool core; sound/fire protection, noncombustible; suited to pharma/bio fire-risk areas
Aluminum Panel	Aluminum skin; light, corrosion-resistant, clean, low-dust and easy to maintain; for electronics/semiconductors
Stainless Steel Panel	Stainless skin; durable, chemical-resistant, hygienic; resists bacterial growth and is easy to disinfect; pharma/bio/medical uses
Mineral Wool / Honeycomb	Mineral wool/aluminum honeycomb core; noncombustible, moisture/chemical-resistant; for high-cleanliness facilities

Installation: Assemble modular wall, ceiling and partition panels; seal panel joints and aluminum/stainless moldings with sanitary silicone for airtightness and hygiene.

Accessories: Aluminum moldings, angles, bases, threaded rods, rivets, color-coated screws and sanitary silicone.

Sizes: Mainly 50T, 75T, 100T panels; silicon-zinc, antistatic color-coated or stainless steel skins.

Mechanical Equipment

Ductwork

Ductwork ensures cleanroom/GMP cleanliness, airtightness, hygiene and durability. As part of HVAC, it blocks outside ingress and circulates, filters and exhausts air. Design and installation consider airflow, filtration, noise and maintenance, following applicable regulations and standards.

Duct Materials & Features

Material	Main Features & Uses
Galvanized Steel (GI)	Widely used, corrosion-resistant, workable and economical; standard for general HVAC and cleanroom supply/exhaust
Stainless Steel (STS304)	Corrosion-resistant, durable, hygienic; mainly for hygiene-critical pharma, bio and food GMP facilities
Aluminum	Light, corrosion-resistant, clean and easy to maintain; suited to semiconductor/electronics clean environments
PVC/FRP	Chemical/moisture-resistant; chemical production, corrosive environments and special exhaust
Fabric Duct	Light, easy to install/move, low-noise; some auxiliary air supply uses
Flexible Duct	Aluminum foil/glass cloth; for equipment connections and tight spaces

Installation: Adjust and inspect each section for airtightness and cleanliness.

Joints: Seal duct/duct and equipment joints (HEPA/ULPA filters, diffusers) with silicone/gaskets to prevent leaks.

Insulation: Apply thermal/acoustic insulation as needed to prevent condensation and noise.

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Piping Works

Cleanroom piping ensures cleanliness, airtightness, hygiene and durability. It provides reliable, contamination-free HVAC, water, drainage, steam, chilled/hot water, gas and compressed air services. Installation must minimize contaminants and ease maintenance and verification.

Piping Materials & Features

Material	Main Features & Uses
Stainless Steel	Corrosion-resistant, durable, hygienic; mainly for hygiene-critical pharma, bio and food GMP facilities
PVC/CPVC	Chemical/moisture-resistant; for chemical transfer, drainage and corrosive environments
PFA/PP	High-purity, chemical/heat-resistant; for ultrapure water and specialty gases
Copper / Aluminum	Chilled/hot water, HVAC and some gas piping; workable and corrosion-resistant

Installation: Adjust and inspect each section for airtightness and cleanliness.

Joints: Seal pipe/pipe and equipment joints (valves, pumps, filters) with silicone/gaskets to prevent leaks.

Insulation: Apply thermal/acoustic insulation as needed against condensation, heat loss and noise.

Coating: Apply anticorrosion and exterior coatings to metal pipes to prevent corrosion and improve durability.

Mechanical Equipment

Automatic Controls

Cleanroom AHU automation precisely manages cleanliness, temperature, humidity and differential pressure for consistent production and quality. Systems monitor/control AHU operation in real time to maintain GMP-compliant conditions.

Functions & Features

Component	Main Function
Sensors	Real-time temperature, humidity, differential pressure and airflow sensing
Controllers (PLC, DDC)	Analyze sensor signals to control AHU fans, dampers, valves, heaters and coolers
Actuators	Operate AHU dampers, valves, fans and other equipment
Monitoring System	Live AHU/environment monitoring, records and fault alarms

Installation: Systematic placement/installation of sensors, controllers, actuators and wiring

Environmental control: Live automatic control/recording of temperature, humidity and differential pressure

Central monitoring: Live AHU/environment status and history management at the central station

Commissioning/verification: Check controls under actual operating conditions and verify to GMP standards

Mechanical Equipment

Maintenance

Pharma and food plants need chillers/AHUs for temperature, humidity and cleanliness. Frequent faults from continuous use require routine maintenance.

Chiller/AHU shutdowns can affect production and finished/semi-finished goods storage, increasing losses.

To minimize client losses from facility failures, we run annual preventive and routine inspections and provide ongoing maintenance.

Maintenance Program

Category	Details
Preventive Inspection	Free annual on-site inspections (Dec.-Feb.), at least two clients a day, regardless of warranty or repair status
Routine Inspection	Scheduled inspections once every six months during the post-completion warranty period

Expected Benefits

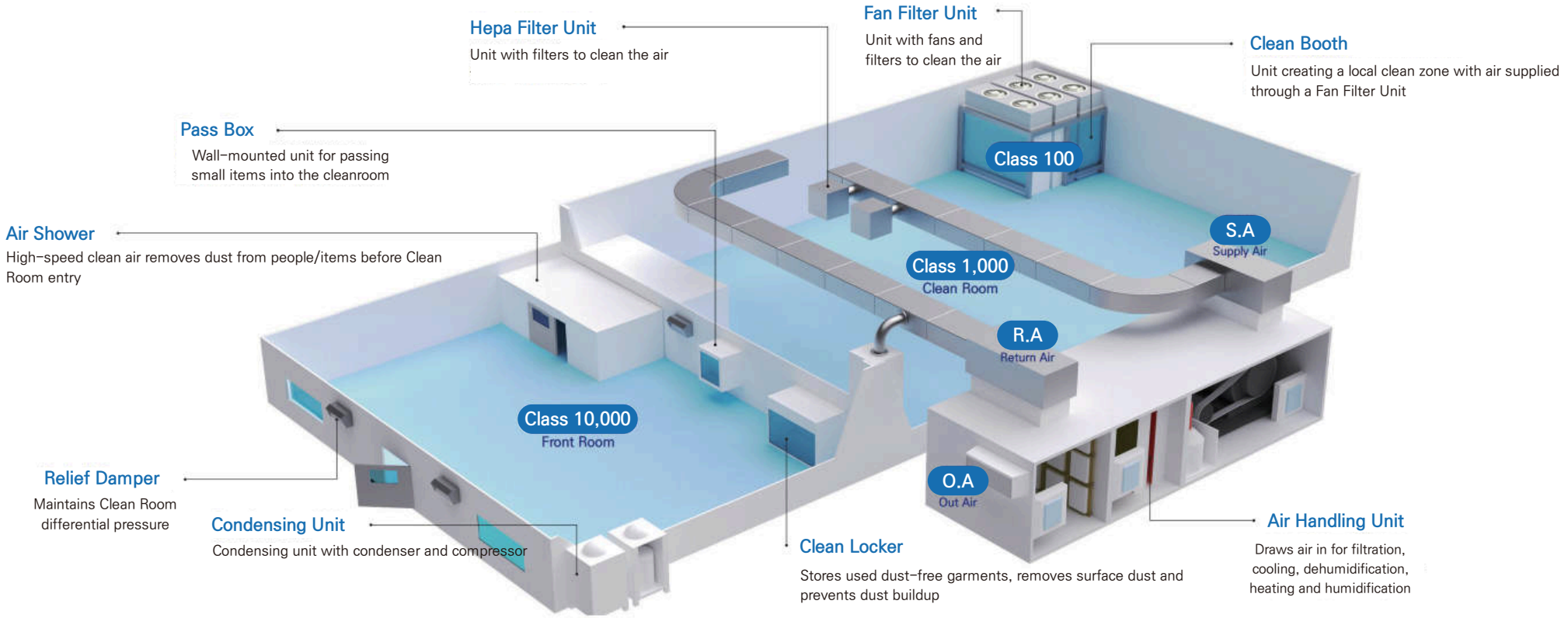
Routine checks prevent failures, extend equipment life and improve energy efficiency

Aftercare minimizes downtime and maintains product quality and stable cleanliness



Cleanroom System Diagram

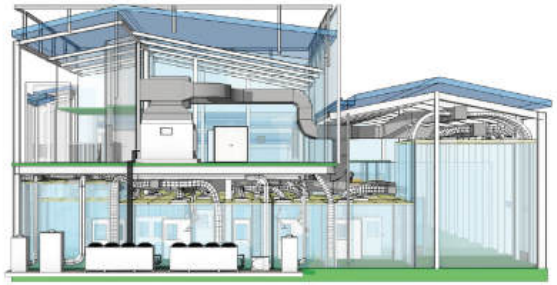
Cleanrooms control airborne particles, limiting dust generation, ingress and retention. Temperature, humidity, airflow and pressure meet requirements.



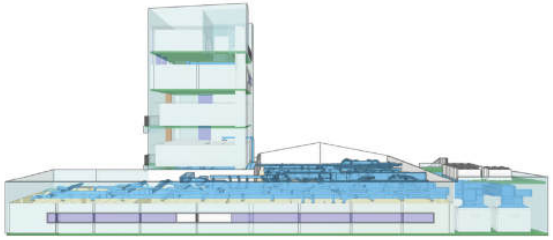


3D Modeling

BIM-based 3D simulation identifies clashes with other trades and design errors in advance, shortening construction time and cutting costs for clients.



Scan the QR code to view the building's 3D model.



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PORTFOLIO

Clients

PROJECT

Project Examples

Other

Clients (Pharma / Chemicals)



Clients (Food / Electrical & Electronics / Medical Devices)



PROJECT



Yuhan Chemical

GMP HVAC works, Building HB BAY-2, Hwaseong Plant

Cleanroom remodeling, Building G BAY-2, Ansan Plant

Remodeling works, Building E, Hwaseong Plant

GMP HVAC works, Building HA, Hwaseong Plant

GMP system works for low-temperature indoor hazardous materials storage

Refrigeration system works for low-temperature hazardous materials storage, Ansan Plant

Pilot room structural reinforcement & HVAC, Building HA, Hwaseong Plant

Cleanroom renovation and repairs, Buildings A-1 and B, Ansan Plant

GMP architectural, HVAC and refrigeration works, Production Building E, Ansan Plant

GMP HVAC works, new building, Hwaseong Plant

Cleanroom relocation and installation, logistics building, Ansan Plant

HVAC works, Production Building B

Hanmi Fine Chemical

HVAC works for aseptic facility, Production Building D

HVAC works, Production Building C

PEG & PEPTIDE production HVAC, Production Building C

HVAC and aseptic room works for cephalosporin/general plant

HVAC works for process testing lab, Production Building C

NMR room construction, Building D

GMP system works, new Production Building D

HVAC works for aseptic room

AHU and HVAC works, Production Building C

CGMP plant explosion-proof dampers, ductwork and pump room panels

Aseptic Room 1 Upgrade

HVAC works for Aseptic Room No. 1



PROJECT



Huons

HVAC remodeling, Building A, Huons BioPharma

Local exhaust improvements, Quality Control Dept.

GMP remodeling, production building

Cleanroom relocation and installation, printing room

GMP construction of diagnostic kit production line, Huons Medicare

HVAC works, Gwacheon Knowledge Information Town 1-A-2

GMP HVAC works, Cartridge Line 2

Extension and remodeling, Huons Foodience Chuncheon Plant

Research facility environmental improvements, Huons Global Seongnam Plant

HVAC works for sampling room and tableting room

Environmental improvements, instrumental analysis lab

Major repairs, Huons Foodience Geumsan Plant

Humedix

Compressed-air plant room exhaust improvements

Integrated layout changes, 4F QC office

Cleanroom HVAC works, weighing room, Plant 2 2F

Cleanroom remodeling and HVAC works, PFS preparation room, Plant 2 1F

Cleanroom changes, PFS work area, Plant 2

GMP HVAC works within PSM supplementary works, Plant 1

Cleanroom changes, PFS work area, Plant 2

Centrifugal chiller fabrication & installation, Plant 2

GMP HVAC works, new vial line

GMP HVAC works, vaccine work area

Extension works, QC laboratory, Plant 2 4F

HVAC works, finished product Production Team 1



PROJECT



Dong-A Pharmaceutical

Supplementary works, drying room, Production Team 2

GMP HVAC works, Production Team 1

CKD-868 PROJECT cold storage / Production Team 2 drying room works

GMP HVAC works, cleanroom

HVAC system works

New dispensing work area, Synthesis Building 2

Dehumidifier fabrication & installation, DSC drying and packaging room, Banwol Plant

Sinil Pharm

GMP works for dry, cool and dark storage / finished goods warehouse

HVAC works, medicated plaster building

Weighing booth improvements, weighing room, main building

Exhaust noise reduction works, machine room

Semi-finished goods warehouse improvement and GMP ductwork

Clean booth change and installation, main building

HVAC works within warehouse and guardhouse extension

Cleanroom remodeling, weighing room

Temperature/humidity unit fabrication & installation

GMP remodeling HVAC works

HVAC remodeling

GMP HVAC works



PROJECT



Daewoong Bio

HVAC works, Plant 1

Design of GMP system works for new Plant 3

Stability room system works

Korea Prime Pharm

New GMP construction works, Medix Pharm

AHU and HVAC works, Plant 1



PROJECT



Pharmgen Science

Cleanroom remodeling, solid dosage area

Repair works, AHU No. 7

Cleanroom environmental improvements, automatic sorting room

Cleanroom layout changes, tableting room

Cleanroom layout changes, weighing room

Cleanroom layout changes, coating room

Cleanroom layout changes, automatic sorting room

ST Pharm

Air supply and exhaust facility works, Sihwa Plant

HVAC works for laboratory rearrangement, Banwol Plant

HVAC works for laboratory relocation, Banwol Plant

Dehumidifier installation, Banwol Plant



PROJECT



Alvogen Korea

New cleanroom works for weighing and sampling rooms, Hyangnam Plant

Weighing room expansion, Hyangnam Plant

Equipment works for incoming holding area and raw material storage, Hyangnam Plant

Semi-finished goods storage remodeling, Gongju Plant

Humidification line works, Hyangnam Plant

Washing room improvements, Hyangnam Plant

Cleanroom remodeling, Hyangnam Plant

Cleanroom remodeling, Gongju Plant

AHU installation and ductwork, Hyangnam Plant

GMP remodeling, Metilon production facility, Gongju Plant

AHU installation, finished goods storage, Gongju Plant

Celltrion

Cleanroom remodeling, BL-2 LAB

Facility installation, BL-2 LAB

BL-2 GMP system works

Supply/exhaust ductwork installation



PROJECT



Medica Korea

Hazardous materials storage extension

Cleanroom remodeling, tablet printing room 2, solid dosage team

Cleanroom remodeling, vacuum dryer machine room

Cleanroom remodeling, production department

Remodeling works, formulation lab and packaging team

Cleanroom remodeling, production area

Cleanroom remodeling, 2F pillow-packaging line

Dongkoo Bio & Pharma

GMP extension / remodeling, Main Building 1

GMP extension, Main Building 9

GMP extension, Main Building 10

Gowning room expansion, Production Team 1, production building

Cleanroom remodeling, new counting line

Exterior wall crack and leak repairs

Environmental improvements, bin blender

Wastewater piping repairs, Pangyo Research Center

Structural reinforcement and 4th-floor extension, Building 4

New outdoor parking lot works

Remodeling works, Building 4 3F

Cleanroom layout changes, production building



PROJECT



Cowellmedi

Fire-stopping works, new Plant 2

GMP cleanroom works, new Plant 2

GMP HVAC works, new Plant 2

Kumho Electric

Cleanroom works, coating room, Lines 17 and 18

HVAC works, Lines 16 and 17

Coating room HVAC, Lines 5~8

Coating room system works

Coating room constant-temperature system, Lines 11~17

Cleanroom works, main building

Exhaust environmental improvements, reliability test lab

Automatic soldering system works

Chilled water piping works, main building

Cleanroom works, research building

Constant temperature and humidity system works, cleanroom

FCU HVAC system, Lines 1~8



PROJECT



Sungyi Bio

New GMP HVAC works

Cleanroom remodeling, 3F manufacturing facility

Cleanroom remodeling, 2F

Layout change and HVAC works, 3F manufacturing facility

Cleanroom works

GMP layout changes

Hwail Pharmaceutical

Fire damage recovery HVAC and architectural works

CDU fabrication & installation, Hagil-ri Plant

GMP HVAC remodeling

GMP extension



PROJECT



Taeguk Pharm

GMP remodeling HVAC works

Cleanroom remodeling

AHU replacement & ZONING changes, Hyangnam Plant

Environmental safety improvements, oral solid dosage Zone 1

Flame-retardant panel replacement and GMP remodeling, spare building

Remodeling works, Quality Dept. 2F

Remodeling works, Quality Dept. 3F

New waste storage building works

Accessibility facility improvements

Waste solvent tank installation

Dentium

Cleanroom GMP system works, new Gwanggyo headquarters

New cleanroom GMP construction works, Yongin Plant

Gowning/auxiliary-material washing room improvements, HQ 6F cleanroom

Cleanroom expansion, HQ 6F

Cleanroom remodeling, HQ 6F

Cleanroom relocation works, HQ 11F



PROJECT



Ahngook Pharm

Cleanroom remodeling, 1F weighing area, main building, Production HQ

Cleanroom remodeling, 1F packaging area, main building, Production HQ

Cleanroom remodeling, semi-finished goods storage

Cleanroom remodeling, new bottle packaging line

Cleanroom remodeling, QC central laboratory

Cleanroom and HVAC improvements, finished goods storage

Anteroom installation for logistics and personnel flow, leased warehouse

Air pollution prevention facility improvements

Cleanroom improvements, semi-finished goods storage

New GMP HVAC works

Cleanroom works

GMP layout changes

Atotech Korea

50RT chiller replacement works, production rooftop

Cleanroom environmental improvements, QC LAB-1

Cleanroom environmental improvement and remodeling

Grating reinforcement, Sump#3,#4, Production Building 1F

Cleanroom repairs

QC LAB GMP expansion

Office remodeling, 3F

Environmental improvements, TC Lab

Environmental improvements, MS Lab

New constant temperature warehouse works

1 ton vessel tank fabrication & installation

TOC booth fabrication & installation



PROJECT



INIST ST

GMP works, raw material synthesis building, Osong Plant

Merck

NF3 ABATEMENT PROJECT HVAC works, Ulsan Plant

HVAC works, ION-X, Banwol Plant





PROJECT CASE

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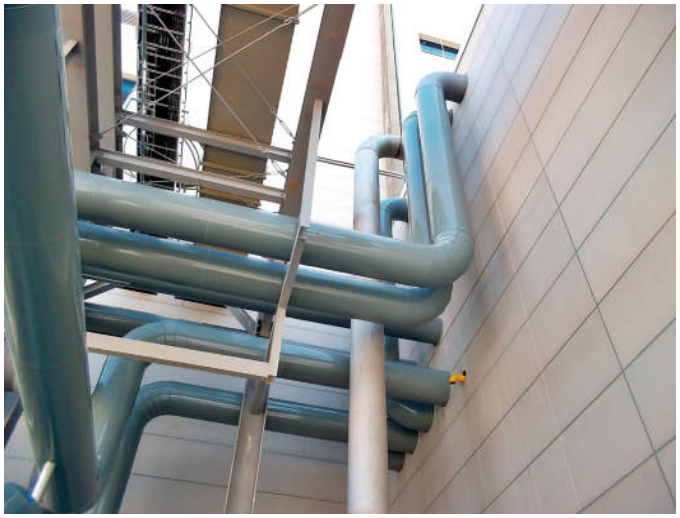





















MAIN MCCB











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Other - Equipment List



Airflow Meter



Particle Counter



Thermohygrometer



Air Velocity Meter

NO	Equipment	Specification	Qty	Remarks
1	Pitch Gauge		1	Thread pitch measurement
2	Vernier Caliper	300mm	1	Precision measurement
3	Anemometer	8386A/TSI	1	Airflow volume/velocity
4	Dielectric Tester	ILO-PT2004	1	Withstand voltage test
5	Electronic Flowmeter	KTM-800	1	Pipe flow measurement
6	Temperature Recorder	DX2020	1	Temperature recording
7	Airflow Meter	ALNOR6465	1	Airflow measurement
8	Particle Counter	237B	1	Airborne particle measurement
9	Digital Thermohygrometer	TESTO 635	1	Temperature/humidity
10	Sound Level Meter	TESTO 815	1	Noise measurement
11	Lux Meter	TESTO 545	1	Illuminance measurement
12	Clamp Meter	HIOKI 3280-10	1	Current/voltage measurement
13	Heat Pump Test Rig	50VP	1	Heat pump/chiller testing
14	Copper Pipe Bender	15A-40A	11	PZPE bending
15	Electric Welder	3KW	1	General welding
16	Oxyfuel Welder		3	General welding

MEMO

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