LEVERAGE AUTOMATION SYSTEMS AND INDUSTRIAL ROBOTS
TO MONITOR PRODUCTION PROCESSES TO CONTROL

LEADING THE WAY IN SMART-FACTORYIZATION

FOURONE SYSTEM

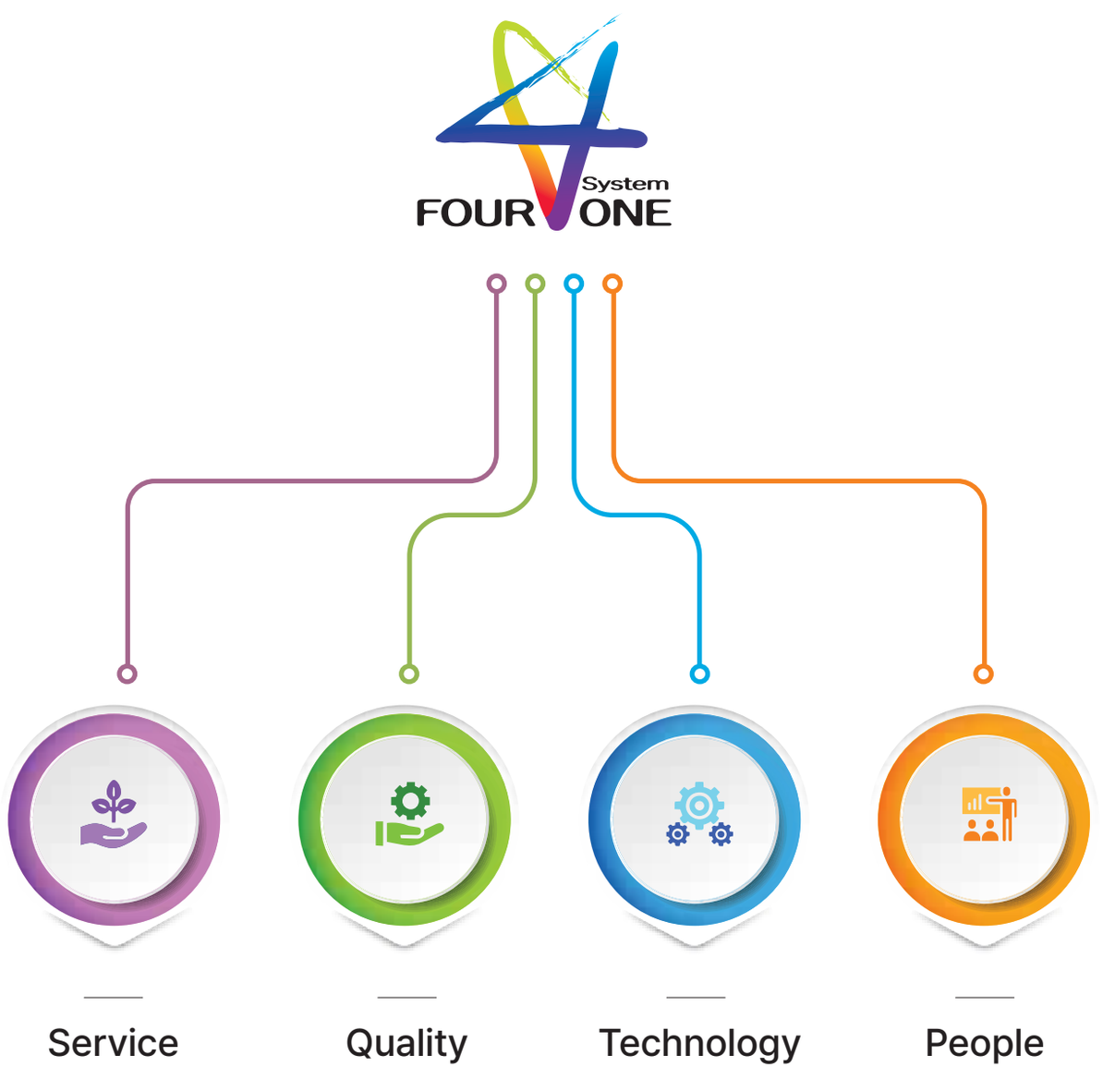
FOURONE SYSTEM CO., LTD.

Fourone System Management Philosophy & CI

Fourone System Co., Ltd. aims to grow alongside its customers and become the Best one by upholding four core values: Service, Quality, Technology, and People.
The company name, "Fourone," reflects this philosophy, combining "Four (4) + One (1)" to symbolize our commitment to these values.

Our corporate identity (CI) features a star-shaped logo that visually represents the numbers 4 and 1, embodying our core principles and our vision to become a top-tier company.

With these values as our foundation, we will continue to pursue innovation and trust, delivering the highest level of satisfaction to our customers.



CEO's greeting

Since its establishment in 2008, Fourone System Co., Ltd. has been striving to build a new industrial environment suited for the 21st-century AI industrial revolution.
We will continue to stand by our customers with innovative ideas and continuous technological advancements.

Safer! More convenient! More perfect!

Through the development of AI and robotics-integrated technology, we will turn the future you dream of into reality.

CEO | Kwon Oh Dae

History

2008.	**Feb**	Established Fourone System Co., Ltd.
	Oct	Certified as a Venture Company (Technology Guarantee Fund)
2009.	**Jan**	Relocated Head Office to Geomdan-dong, Buk-gu, Daegu
	Mar	Recognized as an Affiliated Research Institute (Korea Industrial Technology Association)
2010.	**Jun**	Participated in ITMA ASIA & CITME 2010 (Shanghai, China)
2011.	**May**	Acquired ISO 9001:2008 Certification
	Sep	Participated in Korea International Textile Machinery Exhibition (KORTEX 2011)
	Nov	Certified as an INNO-BIZ Technology Innovation SME
2012.	**Jul**	Relocated Head Office within Geomdan-dong, Buk-gu, Daegu
2013.	**Sep**	Selected as an Industry Convergence Leading Company
2014.	**Feb**	Participated in SHANGHAITEX 2014 (International Textile Machinery Exhibition)
2015.	**Jun**	Participated in SHANGHAITEX 2015
2016.	**Mar**	Participated in SHANGHAITEX 2016
	May	Relocated Head Office to Gaeil-ri, Apnyang-myeon, Gyeongsan-si, Gyeongbuk
	Oct	Participated in ITMA 2016 (International Textile Machinery Exhibition)
	Nov	Selected as an Industry Convergence Leading Company
	Dec	Certified as a Family-Friendly Company
2017.	**May**	Renewed ISO 9001:2008 Certification
	Nov	Participated in SHANGHAITEX 2017
2018.	**May**	Acquired ISO 9001:2015 Certification
	Oct	Participated in ITMA ASIA & CITME 2018 (Shanghai, China)
2019.	**Nov**	Participated in SHANGHAITEX 2019
2020.	**Aug**	Selected as a Global Small Giant Company
2022.	**Oct**	Awarded the Minister's Citation for Contribution to Machinery, Robotics, and Aviation Industry Development
	Dec	Participated in Korea Industry Technology R&D Exhibition
2023.	**Apr**	Selected for Global Small Giant 1000+ Program
	Nov	Participated in ITMA ASIA & CITME 2023 (Shanghai, China)
2024.	**Jan**	Relocated Head Office to 150, Gongdan 12-ro, Gyeongsan-si, Gyeongsangbuk-do
		Selected as a Hope Enterprise in Gyeongsan
	Dec	Family-Friendly Certified Company Reaccredited
2025.	**July**	Selected as an AI Factory Specialized Company by the Korea Institute for Advancement of Technology

Automatic Powder Dosing System(Mass Volume)

SDF®-PW



A system that efficiently stores mass volume of powders in silos and automatically weighs and transfers them according to formulation requirements.

System Specifications

Storage Part

- Storage silo : SUS304
  (customized, Teflon coating : depends on material properties)
- Components : weighing screw, storage tank load cell, material-specific filters, vacuum system, safety bars

Loading Part

- Bulk bag loading device
- Land bag loading device

Weighing Part

- Weighing tank : SUS304 or SUS316
  (customized, Teflon coating : depends on material properties)

Transfer Part

- Piping : sanitary pipe, stainless steel pipe, or Teflon/lined pipe (selectable based on material properties)

Receiver Tank (custom specification if required)

- Components : pressure tank, automatic valve, load cell, filter box

Automatic Powder Dosing System(Mass Volume) SDF®–PW

Core Technologies


Curing Raw Material Crushing and Loading Device


Storage Tank Loading

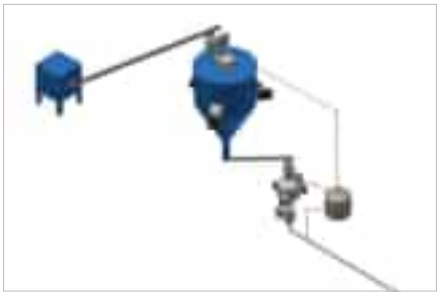

Ton-Bag Loading Device

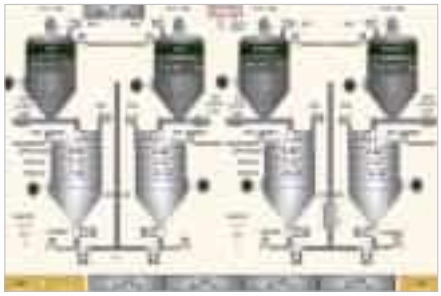

Multi-Material Batch Weighing System


Bag Opening Device


Powder Transfer Direction Changer


Receiver Tank


Basic Configuration Diagram (3D)


Control Program

Installation Cases









Automatic Powder Dosing System

SDF®–PW



A system that efficiently stores powdered raw materials in sealed hoppers and automatically performs precise weighing according to the entered formulation during the production process.

System Specifications

Storage Part

- **Storage hopper** : capacity, material (stainless steel/PVC), shape (square/cylindrical), and size customizable
- **Anti-bridging device or air knocker installed**

Loading Part

- **Loaded by means of a vacuum system**
- **Loading pipe** : sanitary pipe
- **Operation** : pressure-type touchscreen

Weighing Part

- **Weighing trolley incorporating the electronic scale is automatically transported to the correct position**
- **Proportional dosing control** : via servo motor and vibrator
- **Optimal weighing range** : 100 g or more
- **Weighing accuracy** : 0.1–1.0 g (scale display unit : 0.1 g)

Control Part

- **PC and monitor, thermal printer for labeling**
- **ERP / POP / MES interface**

Core Technologies



Custom-Made Storage Hopper


Simultaneous Docking of Weighing Motor and Agitator



Screw Discharge Method


Loaded by Means of Vacuum System


Loaded by Means of Vacuum System


Control Program

Installation Cases









Semi-Automatic Powder Dosing System

SDF®-PW-S



A system designed to efficiently store large quantities of dye boxes in a limited space using multi-stage stacking and automatically load/unload dyes to the weighing position according to the dye formulation.

System Specifications

Storage Part

- **2-row structure, multi-stage stacking** (customized)
- **Frame** : SUS304, aluminum, steel (customized)
- **Storage method** : individual pallet-based dye boxes (optional: dedicated stainless steel boxes with lids)
- **Dye Loading / Unloading** : barcode scanning system

Weighing Part

- **Manual movement of weighing unit along dedicated rails**
- **Components** : barcode reader, thermal printer, weighing storage table
- **Large-capacity scales** : max. 8 kg, 15 kg, 30 kg, 0.1 g unit (optional)
- **Small-capacity scales** : max. 2,200 g, 410 g, 0.01 g unit (optional)

Control Part

- PC and industrial touchscreen
- ERP / POP / MES interface

Dyestuff Storage & Semi-Auto Weighing System

SDF®-PW-S

Core Technologies



Mobile Weighing Unit



Two-row Storage Rack



Dust Extraction Unit



Pallet-type Dye Container



Stacker Crane



Control Program

Installation Cases













Automatic Powder Dissolving & Dispensing System

SDF®–PD



This system automatically dissolves powdered dye in a sealed dissolver and delivers it via piping to the designated equipment on-site.

System Specifications

Dissolving Part

- **Material** : stainless steel
- Automatic supply of dissolving water via flow meter
- Dye dissolution using semi-permanent magnetic impeller
- **Capacity** : 150 / 300 / 500 / 1,000 L, quantity per order specification
- **Dye container loading :** robot or manual

Dye Solution Dispensing Part

- Sanitary pipe & 3-way ball valve
- **Flow rate** : max. 100 L/min

Automatic Magnetic Impeller Detachment Device

- Protects the impeller from magnetic detachment caused by overload during agitation
- Triggers an alarm after automatic separation

Control Part

- PLC with industrial touch monitor
- Dedicated on-site dye calling software supplied separately
- ERP / POP / MES interface

Automatic Powder Dissolving & Dispensing System

SDF®–PD

Core Technologies



Dye Container Rotating Device



Magnetic Impeller



Magnetic Detachment Prevention Device



Recirculation Agitator



Hopper Dissolver – Type A



Hopper Dissolver – Type B



PLC Touch Screen

Installation Cases







Automatic Liquid Dosing & Dispensing System

SDF®–LWD



FOUR System ONE

A system that measures and dispenses liquid materials stored in the storage tanks upon on-site request

System Specifications

Storage Part

- Number of storage tanks, capacity, material (customized)
- Loading method : Individual loading / batch loading / bulk tank
- Level sensor : transmitter type
- Auxiliary agitation : geared motor & impeller (timer applied)

Measuring Part

- Measuring by electronic flow-meter (Endress+Hauser)

Dispensing Part

- Dispensing : By centrifugal pump (max. 100L/min)
- Components : sanitary pipe, 3-way ball valve

Control Part

- PLC with industrial touch monitor
- ERP / POP / MES interface
- Integration with dyeing machine systems (Win D/CPM, SETEX, SEDO) for data exchange
- Network-based dedicated PC and software for monitoring and management

Core Technologies



Dedicated Valve with Minimal Dead Space



Automatic Valve for Acid / Alkali Separation
(Industry First)



Individual Loading Device



Digital Flow Meter



Control Program

Installation Cases













Automatic Na_2SO_4 / Na_2CO_3 Dosing & Dispensing System

SDF®–PWD



This system efficiently stores large-volume raw materials (such as soda ash and saltcake) and automatically meters and delivers them to the corresponding production equipment upon demand.

System Specifications

Sludge

Storage Part

- Cylindrical sealed storage tanks made of stainless steel (SUS316) or PPH
- Capacity : 5 / 10 / 20 tons (configurable per order)
- Temperature and humidity control system

Weighing & Dispensing Part

- Gravimetric weighing by load cell (weighing accuracy ± 0.1%)
- Pumping via sludge pump (transfer rate : 100 kg/min)

Control Part

- PLC with touch monitor
- Network-based dedicated PC and software for monitoring and management

Liquid

Dissolving Part

- Gravimetric weighing by load cell (maintain constant concentration)
- Cylindrical sealed storage tank made of stainless steel (capacity and structure configurable per order)
  - Low-speed mixing via geared motor
  - Mixer motor and temperature sensor

Weighing & Dispensing Part

- Precise weighing by mass flowmeter
- Recirculation system with automatic valves for accurate dosing upon raw material request

Control Part

- PLC with touch monitor
- Network-based dedicated PC and software for monitoring and management

Core Technologies



Powdered Raw Material Loading System



Raw Material Dissolving Tank



Control Program

Installation Cases







Automatic Hydro Dissolving & Dispensing System

SDF®–PWD



This system efficiently stores powdered materials (such as hydro) and automatically weighs, dissolves, and dispenses them to the designated machines upon demand.

System Specifications

Weighing Part

- Weighing tank equipped with load cell
- Replaceable filter box and suction hood for dust collection

Loading Part

- Raw material can loading device
  - Loading via compression-type docking method
  - Rotary device for raw material cans using rotary joint (rotary geared motor and pulley)
- Screw discharge device for metering
  - Screw metering device for proportional control
  - Equipped with vibrator to prevent bridging

Dissolving & Dispensing Part

- Dissolving tank equipped with load cell for hydro weight checking
- Flow meter for cleaning water supply
- Sludge pump (200 L/min, 50–60 Hz, 3,800 rpm)
- 3-way ball valves for circulation and drain

On-site Piping

- 3-way ball valve for dyeing machine distribution
- Transfer piping with hangers and brackets

Control Part

- PLC with industrial touch monitor

Core Technologies



Raw Material Can Docking



PLC Control Program

Installation Cases





Automatic Color Paste Dosing System

SDF®-LW-M



- A system that automatically doses and prepares color formulas (base color + dye + water + urea + oil) required for the printing process
- Automatically weighs dyes, colorants, and other additives in precise quantities, followed by mixing

System Specifications

Weighing Part

- **Weighing method :** gravimetric weighing of base color and dyes using electronic scales
  - Base color discharge nozzle controlled by air cylinder
  - Dye weighing via dual nozzle proportional control using servo motor

Storage Part

- **Base Color Storage** : stainless steel tanks, capacity and number configurable per order
- **Dye Storage** : PE tanks, capacity and number configurable per order
  - Individual dye loading via air diaphragm pump
  - Level sensor using transmitter for monitoring remaining dye
  - Individual circulation pumps with magnetic drive to prevent dye settling
  - Metal filter installed at the outlet of the circulation pump

Color Formula Mixing Part

- **Mixing method** : homogeneous mixer with vertical (up-and-down) motion
- **Mixer motor capacity and number configurable per order**
- **Side scraper installed on the mixer**

Control Part

- PLC with industrial touch monitor
- ERP / POP / MES interface

Core Technologies



Automatic Container Feeding and Automatic Dye Metering System



Control Program

Installation Cases







Automatic Paste Dosing & Dissolving System

SDF®–LW–M



A system that automatically weighs and makes the paste

System Specifications

Paste Maker

- **Base color mixing** : up-and-down motion with homogeneous mixer, container rotation type
- **Motor capacity** : 20–50 HP
- **Number of maker** : configurable per order
- **Raw material feeding method**
  - Automatic weighing of powdered raw materials via load cell (optional)
  - Automatic weighing of liquid raw materials via electronic flow meter (optional)
  - Automatic weighing of water via electronic flow meter

Paste Storage Tank

- **Weighing method** : gravimetric metering using load cell
- **Tank capacity and number** : configurable per order
- **Recipe management via industrial PC**
- **ERP / POP / MES interface**

Core Technologies



Homogeneous Mixer with Horizontal/Vertical Motion and Container Rotation for Efficient Mixing



Automatic Weighing System for Aged Base Color



Control Program

Installation Cases





Loading/Unloading Robot System for Dye Container

SDF®-LU-R



A non-stop automated system where dyes measured by the Dye Weighing System are loaded onto dedicated racks by an industrial robot, and automatically transferred to the Dye Dissolving and Dispensing System upon request from the production site.

System Specifications

Industrial Robot

- Degrees of freedom, working range, and payload (customized)
- Position repeatability : ±0.06 mm
- Dedicated gripper for weighing containers
- Robot transfer rail (customized)
  - Rack-and-pinion type with position control via moving servo motor

Conveyor

- Automatic loading and unloading of dye containers via conveyor
- Equipped with fiber optic sensors and photo sensors

Loading Part

- Dye storage in a multi-layer structure made of stainless steel
- Structure and storage capacity of dye containers (customized)

Dye Container Washing Part

- Completed dye containers are transferred to the washing unit by the robot
- In/Out doors : opened and closed by cylinders
- Washing and drying: using hot water and hot air

System Control Part

- Control panel for robot operation
- PLC control program
  - Robot gripper control
  - Robot transfer servo motor control
- PC monitoring software
  - Monitoring of dye transfer status
- Interfaced equipment control software
  - Controls production equipment and conveyors based on robot workload
  - ERP / POP / MES interface

Safety Devices

- Safety fence, emergency stop button, emergency alarm, rotating warning lights, light curtain, safety doors

Loading/Unloading Robot System for Dye Container

SDF®-LU-R

Core Technologies



Weighing Container Transfer Conveyor



Dedicated Gripper



Dye Container Loading/Unloading by Robot



Tunnel-Type Container Washing Unit



Control Program

Installation Cases









Palletizing Robot System for Roll Fabric

SDF®-LU-R



A fully automated system that handles the transfer and stacking of fabric rolls before and after packaging by an industrial robot, conveyors, LiDAR sensors, and vision-based barcode systems. The system integrates with the Automatic Packaging System to enable non-stop operation.

System Specifications

Industrial Robot

- Degrees of freedom, working range, and payload (customized)
- Position repeatability : ±0.06 mm
- Robot transfer rail (customized)
  - Rack-and-pinion type with position control via moving servo motor
- Dedicated gripper for fabric rolls, with anti-sagging device

Conveyor

- Automatic loading and unloading of fabric rolls via conveyor
- Pallet turntable (optional)

System Control Part

- Control panel for robot operation
- PLC control program
  - Robot gripper control
  - Servo motor control for robot movement
- PC monitoring software
  - Monitoring of fabric stacking
  - Counting of stacked items
- Vision-based barcode system for fabric identification
- Interfaced equipment control software
  - Controls production equipment and conveyors based on robot workload
- ERP / POP / MES interface
- Automatic position correction using LiDAR sensors and depth cameras

Safety Devices

- Safety fence, emergency stop button, emergency alarm, rotating warning lights, light curtain, safety doors

Palletizing Robot System for Roll Fabric

Core Technologies



Dedicated Gripper for Synthetic and Knit Fabrics
(Equipped with guide bars to prevent fabric sagging)



Dedicated Gripper for Polar Fleece



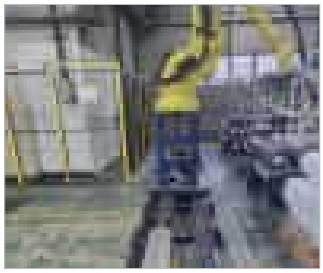
Dedicated Gripper for Heavy Industrial Fabric Rolls



Dedicated Gripper for Square-Packaged Cotton Fabrics



Automatic Fabric Sorting Using Vision-Based Barcode Recognition



Robot Transfer Rail Application
(Enables pallet stacking at various positions)



LiDAR Sensor



Control Program

Installation Cases













Palletizing Robot System for Nonwoven

SDF®-LU-R



A system that automates the loading, transfer, and stacking processes of nonwoven fabrics by an industrial robot, dedicated grippers, and transfer rails.

System Specifications

Robot

- **Industrial robot** (customizable degrees of freedom and working range)
  - Payload : 200 kg (customized)
  - Position Repeatability : ±0.06 mm
- **Dedicated gripper for nonwoven fabrics, with anti-sagging device**
- **Robot Transfer Rail** (customized)
  - Rack-and-pinion type with position control via moving servo motor

Conveyor

- **Automatic loading and unloading of nonwoven fabrics via conveyor**
- **Pallet turntable** (optional)
- **Nonwoven fabric flipping device** (optional)

Automatic Nonwoven Fabric Cutting

- **Cutting method** : rotary or press cutting
- **Sensor for cutting length detection**

System Control Part

- **Control panel for robot operation**
- **PLC control program**
  - Robot gripper control
  - Servo motor control for robot movement
- **PC monitoring software**
  - Monitoring of nonwoven fabric stacking
  - Counting of stacked items
- **Interfaced equipment control software**
  - Controls production equipment and conveyors based on robot workload
- **ERP / POP / MES interface**

Safety Devices

- **Safety fence, emergency stop button, emergency alarm, rotating warning lights, light curtain, safety doors**

Palletizing Robot System for Nonwoven

SDF®-LU-R

Core Technologies



Dedicated Gripper Compatible with Various Fabric Sizes



Cutting Device



Fabric Turnover Device



Automatic System Synchronization According to Fabric Size
(Gripper and Width-Adjustable Conveyor)



Control Program

Installation Cases







Factory Energy Management System

SDF®-EMS



- Real-time monitoring of energy usage (water, steam, electricity) by year, month, and day
- Integration with ERP/MES for production and operations management
- Real-time carbon emission calculations based on energy use
- Customizable reports for energy and emissions data
- Easy installation of flow meters, power meters, and sensors on existing equipment
- Centralized data collection and analysis to optimize production and improve energy efficiency

System Specifications

Energy Monitoring

- Real-time energy consumption monitoring : water, steam, electricity, and gas
- Energy target consumption management
  - Energy target management
  - Upper and lower limit alerts for energy consumption
- Energy consumption statistical analysis
  - Carbon emission calculation and report generation
  - Statistical analysis of energy consumption (hourly / daily / monthly / yearly)
  - Energy consumption inquiry by batch / equipment / process
  - Energy consumption trend graphs with Excel export support
- Overconsumption warning alerts

System Integration

- Work order list data integration
- ERP / POP / MES interface

Core Technologies



Energy and Carbon Emission Monitoring



Equipment-level Carbon Emission Monitoring



Material-level Carbon Emission Monitoring

Process Monitoring System

SDF®–PMS

FOUR ONE SYSTEM CO., LTD. **Tenter System** ○ MES Spec ● TMS Spec Stop Write PLC

Current Equipment		Processing Machine No.5													
Temperature / Hot Air		Chamber 1		Chamber 2		Chamber 3		Chamber 4		Chamber 5		Chamber 6		Chamber 7	
Standard	Set Value	190	L	L	R	L	R	L	R	L	R	L	R	L	R
	Set Value	159.9	160.0	160.0	160.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	160.0	160.0
Actual	Actual	159.9	160.0	160.8	160.8	169.7	169.7	169.0	169.5	169.0	169.5	176.0	170.2	176.0	173.4
	Hot Air	1750	1750	1750	1750	1750	1750	1760	1753	1754	1754	1754	1754	1754	1054



Shrinkage	OVER FEED	FEED IN	PINNING
Standard	20.0	2.0	5.0
Set Value	20.0	2.0	5.0
Actual	20.0	2.0	5.0

Machine Speed	
Standard	30
Actual	21.5

Width	Wide	
Standard	40	42
Actual	38.0	38.4
Actual	38.0	39.7

- Real-time monitoring and management of factory equipment
- Data collection and analysis using sensors, software, and communication technologies
- Improves productivity and supports predictive maintenance

System Specifications

Process Monitoring

- Real-time process status monitoring
- Process status statistical analysis
  - Process statistical analysis (equipment utilization rate / manufacturing lead time / defect analysis by cause)
  - Process inquiry (process history lookup by specific time periods)
- Error occurrence warning alerts

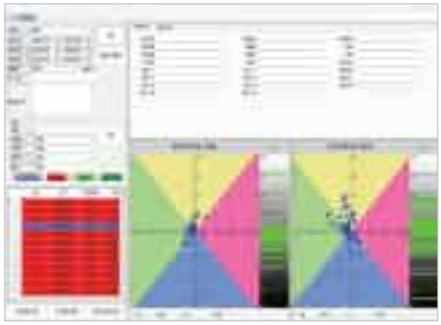
System Integration

- Work order list data integration
- Integration of key equipment operation status data
- ERP / POP / MES interface

Installation Cases







Digital Twin SDF®–DT



- Digital replication of factory systems (equipment, automation, processes) in a virtual environment
- 3D monitoring of system status, process flow, and energy usage – identical to real operations
- Enables real-time data collection, analysis, and optimization
- Virtual simulations for predicting trial production and product quality

System Specifications

Single Equipment Monitoring

- Predictive maintenance, fault (error) point identification, and consumable replacement cycle monitoring real-time operational status monitoring
- Optimal operating condition calculation
- Chemical leakage monitoring

Full Process Monitoring

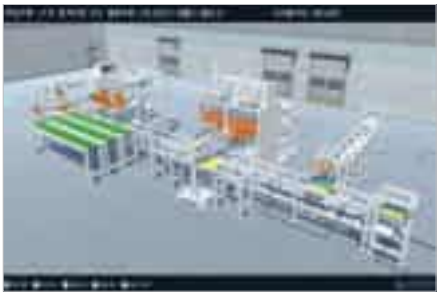
- Process simulation
- Real-time process monitoring
- Real-time logistics flow monitoring
- Temperature and humidity monitoring by equipment
- Optimized production management, including inventory, production, and shipment
- Fire evacuation route visualization and monitoring

Installation Cases


Production Site Process Monitoring 1

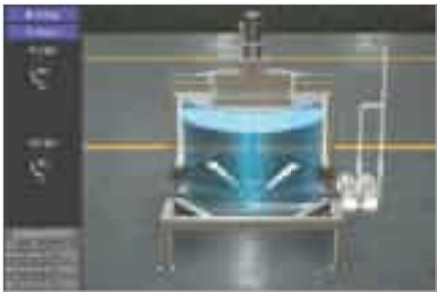

Production Site Process Monitoring 2


WMS Monitoring Using AGVs

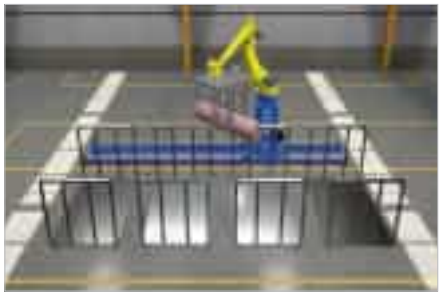

Automotive Engine Parts Assembly Line Monitoring


Waste Heat Energy Recovery Thermoelectric Power Generation System Monitoring


Hazardous Gas (NOx, CO_2) Collection System Monitoring


Melting Equipment Monitoring

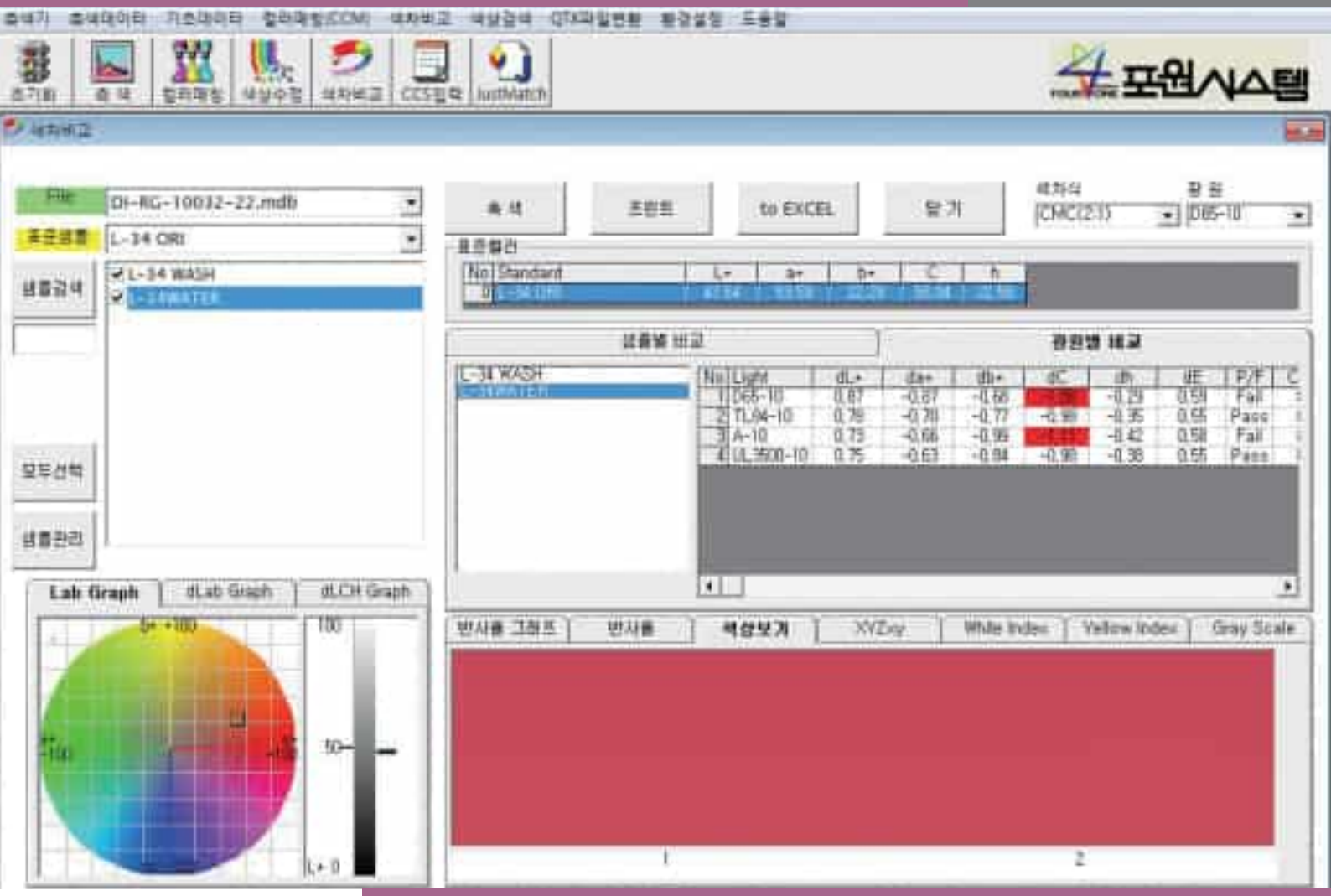

Fabric Transfer and Loading Robot System Monitoring 1


Fabric Transfer and Loading Robot System Monitoring 2


AI-Based Dyeing Equipment System Monitoring

Computer Color Matching System

Match Me



FOUR ONE System

- A Dyeing Recipe Prediction System that calculates dye formulas using a computer to achieve the desired color
- Includes programs for dyeing (batch, continuous, and yarn dyeing) and printing applications.

System Specifications

Key Functions

- **Color matching**, **Color adjustment** (calculation of compatibility index), **Color search** (by light source, color difference detection), **Color management**
- Calculation of compatibility index
- Quality control

Compatible Colorimeters

- X-Rite series
- Minolta series

Control Part

- PC & monitor
- ERP / MES interface

Core Technologies


Control Program


Color Adjustment

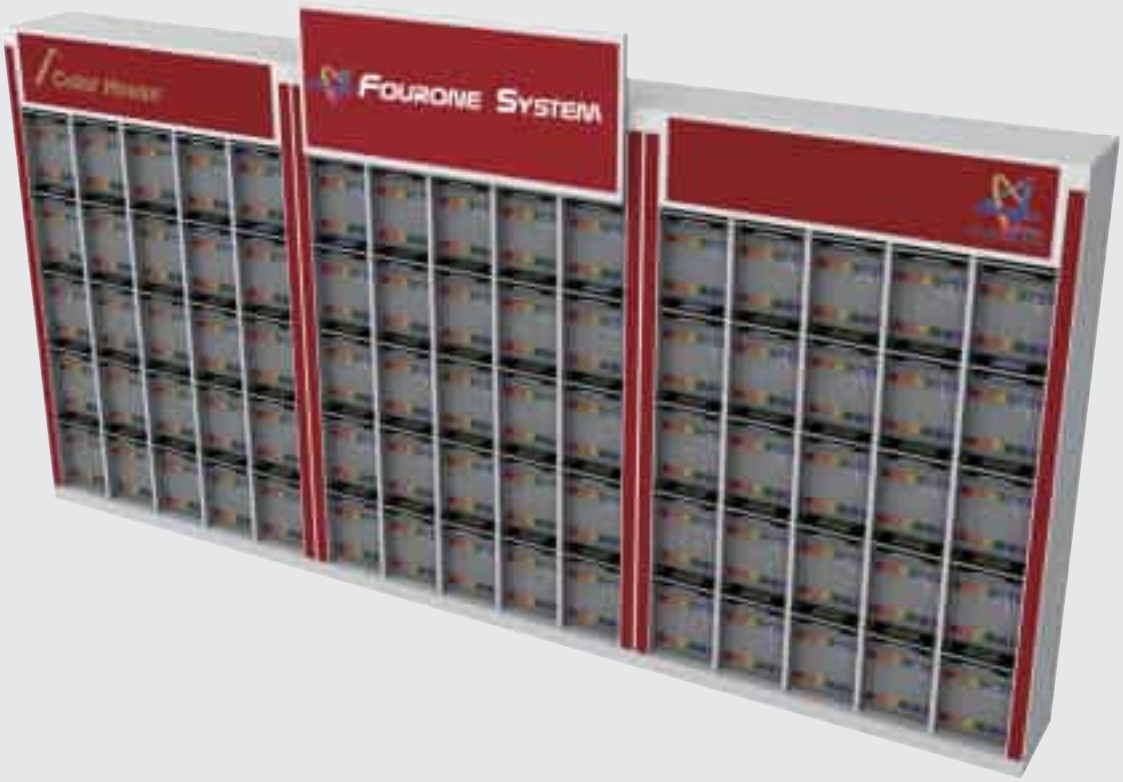

Color Difference Comparison


Color Matching


Color Matching


Printing-Only Format

On/Off Line Color Searching System



- A Color Sample Management System that standardizes and manages the vast number of color sample data generated in dyeing factory laboratories and on-site
- By entering color sample information (color, material, buyer, process date), the system can locate the storage position of the corresponding file

System Specifications

Storage Unit

- File cases stored in wood frames with front tempered glass doors
- Each compartment stores 6 file cases, with location indicator lamps for each compartment
- Storage capacity : customizable per customer specification (default : 3 units, W4,965 × D370 × H2,630 mm)

Key Functions

- Color sample registration and search
- Work order input and output

Control Part

- Operating PC, monitor, barcode printer and reader (thermal type)
- Data integration with ERP / MES systems

Core Technologies



Location Indicator Lamps Using Barcodes



Color Database Construction



ERP / MES Interface

Liquid Dyestuff Dispensing System for Lab

Magic Pro-W



- A system that automatically pipettes liquid dyes in the laboratory
- Each stock solution bottle is equipped with an individual pipette.
  The system performs automatic calibration by weight and measures doses by volume, ensuring accuracy regardless of dye concentration
- Delivers optimal performance even in printing factories using high-concentration dye solutions (20% or higher)

System Specifications

CCK

- **Volume-based dosing method** (with automatic weight-based calibration)
- **Individual syringe applied to each stock solution bottle, eliminating the need for rinsing**
- **Syringe capacity :** 40 cc, glass stock solution bottle capacity 800 mL (customized)
- **Calibration scale** : 0.01 g unit (maximum 1,000 g including container)
- **Magnetic stirring device included**
- **3-axis cartesian robot** (servo motor)

CCK for Printing Applications

- **Tank supply** : precise dosing via mono pump
- **High-concentration stock solution mixer**

Stock Solution Preparation Part

- **Scale unit** : 0.01 g
- **Selectable cold or hot water**
- **Free-fall type dosing**
- **User-friendly touchscreen interface**

Core Technologies


Individual Stainless Steel Syringe


3-Axis Cartesian Robot for Pipetting


Printing-Dedicated Paste Dosing System


Automatic Stock Solution Preparation Unit


Equipped with Safety Cover


Control Program

Installation Cases













Unmanned Automatic Dyeing System for Lab

Magic Pro–WA



A fully automated system that automatically weighs and dispenses dyes, additives, and water required for laboratory dyeing of fabric samples, performs the dyeing process, and automatically discharges the fabric after washing.

System Specifications

Automatic Stock Solution Maker

- Dye dispensing via screw (screw-type) method with weight-based dosing
- Water dosing accuracy : ±0.02 g

Solution Preparation Unit

- Stainless steel syringe capacity : 40 cc
- Glass stock solution bottle capacity : 800 mL (customized)
- Automatic calibration for each stock solution
- Dosing accuracy : ±0.02 cc
- Prepares stock solutions based on usage and pattern analysis for each solution

Dyeing Machine

- Number of dyeing machines : customizable (default : 4 sets, 4 pots × 4 sets = 16 pots, pot capacity 250 ml)
- Dyeing method : high-temperature, high-pressure, up-and-down shaking, induction heating
  - Factors applied to each dyeing machine based on analysis of tendencies from on-site machines
- Solution input : automatic weighing and dispensing via the solution preparation unit according to the dyeing method
- Fabric preparation unit (separate)
  - Equipped with helix bar for achieving low liquor ratio
  - Up to 5 pots per dyeing machine can be queued, enabling unattended overnight operation

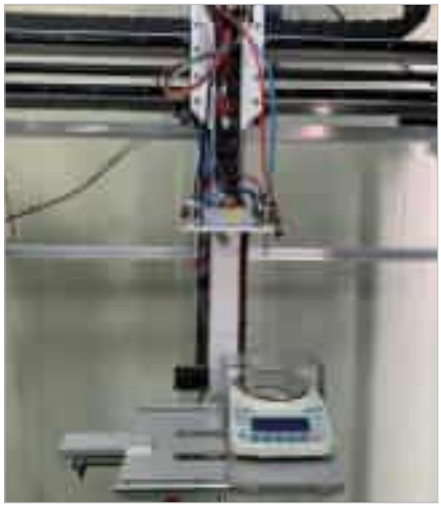
Core Technologies



Induction Heating Dyeing Machine



Automatic Dye Pipetting System



Automatic Stock Solution Maker



Control Program – Fabric Weight Measurement



Control Program – Robot Setup

Sample Dyeing Machine SDF®–SD





- A sample dyeing machine used to dye approximately 1–3 yards of fabric before applying laboratory dyeing data to on-site production
- Enables the generation of data that closely reflects actual production dyeing conditions

System Specifications

High-Pressure Liquid Dyeing Machine

- **Maximum pressure** : 5 kgf/cm²
- **Maximum temperature** : 145 °C
- **Heating rate** : 0.5–5 °C/min
- **Liquor ratio** : 15–100 g
- **Dye solution volume** : 10–100 mL
- **Sample fabric weight** : 30–100 g
- **Dyeing circulation method** : reversible (clockwise / counterclockwise)
- **Dye solution rotation** : magnetic stirring drive
- **Pressurization** : air pump
- **Total dye solution capacity** : 1,700 cc

Automatic Warehouse Management System

SDF®–WMS



- A system designed to efficiently utilize space and manage inventory effectively
- A system that stacks and stores goods using automated cranes
- Maximizes the use of vertical warehouse space and enables real-time inventory management

System Specifications

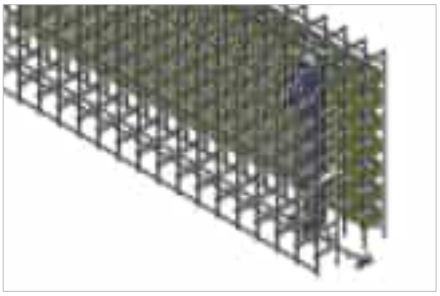
Logistics Warehouse (stacker crane type)

- Customizable number of racks and stacker cranes
- Position control using servo motors and rack-and-pinion gears
- Equipped with sensors for misplacement detection
- Double inbound prevention through software locking

Control Program

- Database integration for product inbound and outbound operations
- Storage zone assignment by item and location search
- Real-time warehouse inventory and status monitoring

Core Technologies



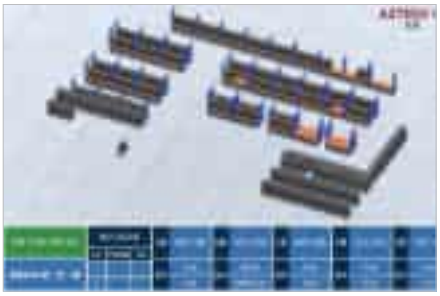
Multi-Level Storage Using a Double-Acting Stacker Crane



Automated Heavy-Load Inbound and Outbound System



Automated Heavy-Load Inbound and Outbound System
(Pallet Magazine Applied)



WMS Control Program 1



WMS Control Program 2

Installation Cases



Automatic Steel Coil Inbound and Outbound System
(Automatic Calculation of Inbound/Outbound Conditions)



Automatic Yarn Inbound and Outbound System
(RFID Applied)



Fabric Pallet Inbound and Outbound System
(Barcode Applied)

Autonomous Mobile Robot

SDF®–AMR



An automated vehicle equipped with autonomous driving capabilities that performs material transport, loading, and unloading tasks in various environments such as automated warehouses and production facilities.

System Specifications

Unmanned Forklift

- **Maximum load capacity** : 1.5 tons (customized)
- **Maximum lifting height** : 4,000 mm (customized)
- **Travel speed** : max. 1.6 m/s (loaded)
- **Charging time** : within 1.5 hours
- **Key features**
  - Automatically manages its own driving and scans the surrounding environment to move along optimal routes
  - Designed to withstand heavy loads, including heavy goods and fabric pallets
  - Equipped with safety devices, sensors, and alarm systems to prevent collisions with workers or obstacles
  - Supports data integration with other automation systems and enables real-time operational status monitoring

Core Technologies



Fabric Roll Loading / Unloading



Control Program



Digital Twin–Based Monitoring

Installation Cases

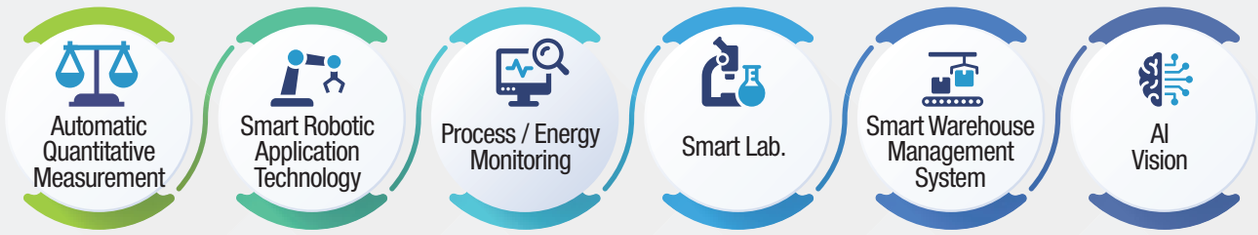


Unmanned Forklift



Unmanned Forklift

Core Technology



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