Company Profile

Mt. FUJI

(Aim)Bridging to Recycling-oriented Society

Environment・Energy Saving・Recycling・Preventive Maintenance and Refurbishment of Factory

A Trading Company specializing in Industrial Equipment & Materials

SANWA CORPORATION CO., LTD

Outline of our Company

1.	**Company Name**	SANWA CORPORATION
2.	**Establishment**	30 JAN. 1958
3.	**Company Business**	1. Sales of Chemical Products 2. Sales of Machine Equipment 3. Ordinary Construction Business 4. Export and Import Business
4.	**Capital**	JPY27,000,000.
5.	**End of the fiscal period**	End of March
6.	**Main Bank**	The Hiroshima Bank, Ltd. (Otemachi Branch) MUFJ Bank, Ltd. (Hiroshima Central Branch) The Shoko Chukin Bank, Ltd.
7.	**Registration of Construction**	Approval of Hiroshima Prefectural Governor.(No.27-35678) Painting business, Plastering work, Water Proofing work, Interior finishing work, Roofing business, Mechanical Equipment Installation
8.	**Other Qualification**	Registration of Sales for Poisonous & Deleterious substances (Registration No. 1434) Registration of Export & Import code (Code No. 73797) Registration of Export & Import Company for Drug materials etc. (Hiroshima 52-19) Comprehensive qualifications by the Japanese government (160511000107) Identification number and password for receiving support from Electronic information processing system (A00063827) Incorporated Administrative Agency Japan Mint, Grade Decision Notice (No.31-480)

9. **Company's History**

Aug. 1953	Established Sanwa Shoukai at 100, Kokutaiji, Hiroshima city
May. 1957	Newly set up the office at 1-4-10, Sendamachi, Naka-ku, Hiroshima City for business expansion
Jan. 1958	Reorganized as Sanwa Corporation and took over all the business operation
Apr. 1960	Set up Field work Dept.
Jun. 1962	Opened Shiga Branch (Closed Feb. 2011)
Mar. 1970	Opened Yoshijima Office and Warehouse

Nov. 1972	Newly built Head office at 1-4-10 Sendamachi, Naka-ku, Hiroshima city
Apr. 1973	Opened Osaka office
Feb. 1975	Opened Kyushu Branch
Dec. 1978	Approved as Constructor (engaging in Paint work)
Mar. 1981	Opened Sanin Sales office (Closed Dec.2010)
May. 1981	Opened Tokyo office (Closed Dec. 2006)
Jul. 1989	Newly built Sanin Sales office
Nov. 1992	Newly built Head office at Yoshijima and integrated Yoshijima office into Head office
Jun. 1998	Obtained the approval of Construction Minister as General constructor
Mar. 2011	Approval of Construction Minister as General constructor by Hiroshima Prefectural Governor
Sep. 2011	Work Dept. closed

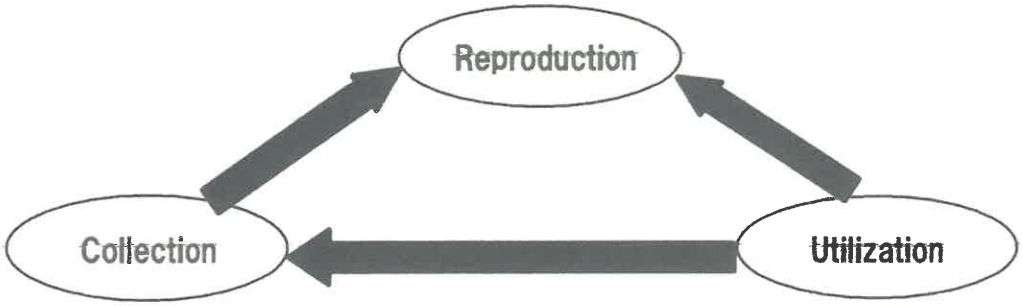
10. *Numbers of Qualified Company Members*

Hazardous material engineer (Class A) ---------- 1 person
Hazardous material engineer (Class B) ---------- 5 people
Handlers of Poisonous and Deleterious Substances ---------- 2 people
Qualified person for heat management---------- 1 person
Working environment measurement expert Class II ---------- 1 person
Hydraulic System Adjustment 2nd grade ----------1 persons
Building operation and management engineer 2nd Grade Finish -1 person
Foreman / Safety and Health Supervisor ---------- 2 people

Recycling of Solvent and Plastic

Private Declaration ISO14001.

Our company will tackle the Environmental problems based on ISO 14001 Standard System



Aim : Bridging to Recycling-oriented Society

Environmental Policy

1 Establish and utilize the environmental management system
2. Observe the law and agreement etc. to prevent the environmental pollution
3. Set the environmental object and target and review them periodically and Implement the environmental improvement activity continuously.
4. Develop the environmental products, and procure the environmental materials and facilities.
5. Tackle the reduction of the wastes, recycling promotion, Resource-saving and Energy-Saving.
6. Notify the environmental policy to employees and customers and disclose it to the society.

Preventive Maintenance & Refurbishment of a Factory

1) Promotion of Preventive Maintenance

In order to ensure the performance and safety of equipment, we promote automation and labor saving, implement daily inspection management of equipment inside and outside the factory, review the quality of painting, waterproofing, and heat insulation materials, and prevent deterioration of usage environment and performance degradation of equipment caused by rust, leakage, condensation, etc.

2) Promotion of Efficiency and Energy-Saving

① Replacement of old hydraulic units with DAIKIN energy-saving equipment at machine factories

② Standardization of cab cooler and duct piping work for large cranes

③ Construction of heat shielding and heat insulating coating on the roof, sheet waterproofing work on the floor

④ Expanding sales of patch seals: new transportation systems, bridge joints, and peripheral seals for heating tanks

⑤ Construction of anti-condensation paint for plant piping system

3) Improvement of Safety Environment

① Automatic lubrication of large-scale steel structure equipment in high places ---cargo handling equipment

② Prevention of scattering of harmful substances---dust collectors, water treatment equipment, VOC countermeasure equipment

③ Prevention of penetration leakage of harmful substances---FRP waterproof coating and improvement of soil investigation

④ Comprehensive Sanitation Management: HACCP---Antibacterial/Antifungal Painting Work

4) Expanding sales of Sanwa Brand Products

①Sanwa Thinner:Outsource manufacturing to multiple external factories (OEM production)

② Sanwa AVCD: Auto Valve with Control Device

③ Sanwa Masso Rosin:Commercialized at a factory in Vietnam / Sole Agent Contract

5) Extend machine life and reduce equipment cost by maintenance repair of hydraulic and pneumatic equipment (including overseas products)

① Hydraulic Cylinder • Motor • Pumps

② Lavor-saving in post-process by preparing pneumatic equipment in pre-process

List of products handled

Product name	Breakdown
General products	
① Paints	UV paint for corrosion protection and wooden floor (CMP), Factory floor paint (ABC Trading, MIZUTANI PAINT), Exterior wall paint (SK KAKEN, NIHON TOKUSHU TORYO)
② Silicone	Shin-Etsu Chemical products for paint base material, heat-resistant insulating oil and high vacuum sealing
③ Hydraulic equipment	Cylinders made by TAIYO, PARKER, JUFAN(Taiwan) and CYSKO(Korea), Distribution valves for lubrication parts (DLP), Single-point lubrication devices (Taiwan)
④ Valves	SUS ball valves made by SICO (Korea) have been delivered to water distribution systems in high-rise buildings for over 10 years without any accidents.
Our own products	
① SANWA AVCD	A pre-prepared product that adds a control function to an actuator-equipped butterfly valve, reducing new installation and maintenance work in factories.
② SANWA thinner	Manufactures cleaning thinners for specific applications with adjusted ingredients under its own brand.
③ SANWA Masso Rosin	Switched materials to MASSONIANA RESIN at VINHCONSHIP (Vietnam) from that of Chinese rosin which is shortages and Vietnam one is a cheaper and a performance is comparable to Chinese one.
④ VOC	Organic solvent countermeasure equipment
Contracted processing products	
① Large CAN manufacturing products	At 大重集団 and 金州重型(China), we manufacture hundreds of tons of structures, as well as, large SUS structures and tanks, by managing the process, adhering to schedules and ensuring quality.
② Pressure vessel	At DAEHEUNG(Korea), we manufacture SUS heat exchangers and containers.
③ Large piping work	Installing thermal insulation on the round piping for the cab cooler of a large crane.
④ Waterproofing work	We apply Shin-Etsu Chemical silicone sheets and other materials to the joints of concrete blocks in tank berms, agricultural irrigation channels, and fireproofing tanks to stop water from entering.
⑤ HIP processing	We have a track record of joining large wear-resistant parts by powder sintering + diffusion bonding for plastic processing machines by using heat-sensitive hydrostatic pressure (HIP) of KUROKI KOGYOSHO, for over 30 years.
⑥ Hydraulic maintenance	Preventive maintenance of cylinders, pumps and motors. We check the effectiveness of packing and, if necessary, hard chrome plate and re-polish the main internal parts to restore them.

⑦ Precision distillation	Performs precision distillation using the Oldershaw method.
⑧ Explosive bonding work	We manufacture composite materials such as Cu/SS, SUS/SS and Ti/SS using explosive force. We have a track record of delivering 850T Cu/SS clad to the TOKYO Linear Motor Car-Oedo Line.
	Revised) 8.28.2023

Factory spare parts (Equipment / Parts)

(Related documents are in bold)

Division	Product name	Manufacturer name	Details
Device	Pump	DAIKIN INDUSTRIES	For grease lubrication
		ARO・TAIYO	Diaphragm pump for large volume chemical liquid
		GADELIUS	Albin pump for small volume chemical liquid
		HONDA KIKO	Centrifugal pump
	Chiller	DAIKIN INDUSTRIES	**ASME Renewal of pressure vessels and coolers made by other companies**
	Cooler	**DAEHEUNG**	
Hydraulic pressure	Hydraulic equipment	SEWON	Hydraulic unit, quick delivery(baggage import)
		JUFAN	**For frequent use in steel mills**
		CYSKO	Hydraulic and Air cylinders for mass production machines
	AUTO VALVE	**Butterfly valve**	**With control function 16K-50A～10K-450A**
	RepairMaintenance	**Pump・Motor**	**Use of Japanese packing and maintenance at Kitakyushu factory**
	Hydraulic clamper	SANYOU INDUSTRIES	
	Universal joint	TAIYO KOKI、UNITEC	Power cylinder
Parts	Coating roll	GUNZE	Fluorine resin cover (paper feed roll)
	・papermaking ・iron making	OHTSU CHEMICAL	Urethane rubber coating
	・plywood ・the film	KATSURA ROLLER	Integrated rubber roll (Nitrile, Fluorine, Silicone)
Parts	Instrumentation / Control	DAIKIN INDUSTRIES	Distributing valve (low-priced stock item)
			Replacement with Lincoln product
		NARA	Fluid Coupling, Coupling
		SICO・WOOSUNG	**SUS valves, ball valves (API certified)**, Check valves
		TOKYO RYUKI KOGYO	Flowmeter
		KONAN ELECTRIC	Pressure switch, air filter
		TLV	Steam trap
Part	The expendables	NihonSpindleManufacturing	Dust collection filter
		HILLARD	Compressor oil filter
		Patch seal	**Shin-Etsu silicone tarpaulin**
RawMaterials	**GUM ROSIN**	**SANWA MASSO**	**Joint development and exclusive sales contract with Vietnam factory**
Solvent	**Cleaning solvent**	**SANWA thinner**	**For cleaning**
		Hydrocarbon solvent	CFC Substitute solvent, NMP

Supply List for STEEL PLANT

For JSW STEEL (VJNR & Dolvi Plant)
Nippon STEEL (Kure & Kashima)

SANWA CO.

Element	Maker Name	Parts Name	Delivered Quantity
Fluid Control & Piping Parts			
1.SANWA Auto Valve with Control Device	SANWA CO SICO (Korea) KONAN	Auto Valve JIS10K 150A (Attached photo)	1 Pce
2.Distribution Valve	DAIKIN	Distribution Valve	1,012 Pcs
		Distribution Valve Cap	4,000 Pcs
3.AUTO Chain Lubrication		Chain Automatic Lubrication	3 Pcs
		Air Driven pump	1 Pce
4. Rotational Fitting		Rotational Fitting	8 Pcs
		Chain Automatic Lub Push Gun	3Pcs
5. One Point Lubrication		Grease Nipple	50Pcs
		PISTON PUMP	1 Pce
6. AIR VALVE	SANWA, Taiwan	One Point Lubrication Heat resistance 150℃ type	280 Pcs
7. Butterfly Valve	KONAN ELECTRIC	Solenoid Valve	79 Pcs
		Air Filter	37 Pcs
		Regulator	4 Pcs
		lubricator	10 Pcs
		Silencer	42 Pcs
		Flow Control Valve	20 Pcs
		Solenoid Valve for Seal kit	130 Set
	OKM	JIS 10,16K 100A 150A 450A	21Pcs
	VENN	Air Vent Valve	15 Pcs
Machine Parts			
1. Hydraulic Cylinder	HARIMA MACHINERY, JUFUN	Hydraulic Cylinder	120 Pcs
		Seal kit	38 Set
2.Position Clamper	SANYO KOGYO CO.	BREAKE PAD KIT	251 Set
		Hydraulic Position Clamper	36 Pcs
3.Coupling	Hillyard	Control Panel for DC AREA	2 Pcs
	YOKOHAMA RUBBER	Sealing coupling	50 Pcs
4.PUMP	NARA	Gear Coupling	1 Pce
	HONDA KIKO CO.	Pump Parts	133 Pcs
5.Brake	KUBOTA	BOOSTER PUMP SLEEVE	2 Pcs
	FAWICK	Air Brake Panel	2 SET
6.Bearing	KOYO	Bearing	16 Pcs
Measuring & Instrumentation Equipment			
1.POSITIONER	TOMOE VALVE CO.	POSITIONER	1 Pce
	KAWAKI	FLOW SWITCH	7 Pcs
2.FLOW SIGHT		FLOW SIGHT	10 Pcs
	TOKYO RYUKI KOGYO	Liquid Detector	2 Pcs
	SANWA CO, Chaina	INDICATOR XK3101	15 Pcs
3.INDICATOR	KYOWA	Transducer	2 Pcs
	NAGANO KEIKI	Transmitter	16 CPs
4.Transducer	FUJI ELECTRIC	CIRCUIT	60 Pcs
		AC CONTACTOR	2 Pcs
5.ELECTRIC PARTS	YAMARI INDUSTRIES	LIMIT SWITCH	4 Pcs

(at. 15 APR. 2023)

Import/Export Record(From 1993)

Category	Customer Name	Details
Cast iron products 大連機床	三菱農機	Construction Machinery Parts FC200 200kg/Pce Total 40Ton, 200Pcs
	MHI/Hiroshima Toyo Advanced Technologies	Machinery Parts FC250, 300 Total 43Ton, 800Pcs
	SHINKO IND.	Pump Parts FC200 Total 27Ton, 600Pcs
	MHI/Mihara	Paper Machinery Parts FC200 Finished Products 1Ton
Cast steel products 大連重工	MHI/Mihara	Steel-making Machinery Parts SC450 Total 633Ton, 300Pcs
	MHI/Takasago	Turbine High-pressure casings SCPH2, 11 1~7Ton/Pce Total 45Ton, 14SET
	MHI/Nagasaki	Industrial Machinery Parts SC410 Total 45Ton, 30Pcs
	TERAL INC.	Pump Casings Finishing Products SCS13 Total 8Ton, 242Pcs
	Shin Nippon Machinery	Bearing Covers Finishing Products SCPH2 Total 4Ton, 104Pcs
Forged products	MHI/Shimonoseki・Mihara JSW	Shafts, etc. SCM435, SCM440, S43C Total 4Ton Shaft finishing products S45C 1Ton
Explosive materials 大連造船爆着研究所	MHI/Mihara	Conductive materials for Linear Motors Cu/SS CLAD Total 860Ton, 2800Pcs
	MHI/Nagasaki・Shimonoseki	Mooring hardware for LNG ships and Aluminum ships 5-layer clad welded joints AL/AL/Ti/Ni/SUS Total 3Ton
	DAIDO METAL	For Diesel Parts Sliding Materials AL/SS CLAD Total 3.5Ton、Cu/SS CLAD 1Ton
Assembled and canned products 大連重工 金州重型	MHI/Hiroshima	Tire machinery parts Total 20Ton 69 units
	MHI/Hiroshima	Tank for oil cooler Thin plate cans SS400 Total 7Ton, 134SET Hanging fittings Cans SS400 Total 22Ton
	MHI/Hiroshima	SUS double-type oil filter(API Compliant) 1SET
	Large cans and structures	Pulley iron core SS400, S25C, S35C Total 30Ton Bags, hanging frames, tilting trays, etc. SS400 40Ton Conveyor rack SS400 Total 120Ton
	MHI/Shimonoseki	Marine auxiliary equipment Total 80Ton 20SET
Pressure vessels 金州重型 DAEHEUNG	Chugoku Kogyo JSW	LPG tank Total 21Ton, 21SET SUS POT、HEAT EXCHANGER、SNUBBER etc. Total 19.4ton
	Hazardous Containers	IBC tank SUS304 2SET 1Ton
	MHI/Mihara・Takasago	Condensers, Heat exchangers, etc. SS400 Total 63Ton 4SET
	MHI/Hiroshima	RUN DOWN TANK for ethylene plant oil supply equipment SUS304 Design included Total 3SET 6TON
Equipment and parts SICO JUFAN KONAN SANYO DLP	Korean Products	Check valve SUS 4,990PCS 10,750kg Ball valve SUS 2,880PCS 29,660kg
	Nippon Steel/Kure	Oil/Pneumatic cylinder φ250×812st etc. Total 79 units 7.9ton
	Nippon Paper	Hydraulic cylinder φ200×600st etc. 6 units 380kg
	Kobe Steel/Chofu	Solenoid valve 6 units 30kg
	India/JSW Iron works	Valve/Pump machinery parts About 19,000kg
	Korea/POSCO Iron works	Backup rolls、Reducers、DAIKIN Hydraulic equipment、TOMOE Valves, etc. 10Ton
	Korea/SEWON	Hydraulic valves (High pressure stop valves, etc.) 25 units Total 210kg
	SHIMHS・Nippon Steel	One-point lube 260 units
	MAZDA・UBE Machinery and more	Oil contamination checker
Chemical products 日成・VICO	Italy China Korea Taiwan Japan Vietnam	Iron oxide pigment 1,071Ton、Ethyl silicate 8ton、Rosin from China 228Ton、Algae prevention material 13.7ton、Vitamins 6kg、Synthetic auxiliary agent 576ton、Cardanol 800kg、Rosin from Vietnam 144ton TOTAL 1,018.5Ton

Revised) R05.08.28 TOTAL About 4,290 Ton

Main Customers

CHUGOKU MARINE PAINTS, LTD.
OHTAKE-MEISHIN CHEMICAL, Co., Ltd.
KOBE PAINTS, LTD.
MHI Commercial Aviation Systems
NIDEC MACHINE TOOL CORPORATION
Mitsubishi Heavy Industries, Ltd. (Shimonoseki)
Primetals Technologies Japan, LTD.
MHI Compressor, LTD.
MHI Machinery Technology corporation
MHI Machinery Systems, Ltd.
MHI Plant corporation
Sumitomo Heavy Industries Material Handling Systems Co., Ltd
The Japan Steel Works, Ltd.
Nikko Techno Corporation
Nippon Paper Industries Co., Ltd.
UBE MACHINERY CORPORATION, LTD.
Teral Inc.
IHI Transport Machinery Co., Ltd.
Nippon Steel Corporation
Kobe Steel, Ltd.
OJI ENGINEERING CO., LTD.
JFE Shoji Corporation
POSCO Steel Co. (Korea)
JSW Steel Ltd. (India)
Toyo Kohan Co., Ltd.
Mazda Motor Corporation (Technical Research Institute)
Satake Corporation
Kobelco Construction Machinery Co., Ltd.
ShinMaywa Industries, Ltd.
Chugoku Kogyo Co., Ltd.
Hokoku Kogyo Co., Ltd.
ITOCHU ENEX Co., Ltd.
Aoi Chemical Inc.
SANKO Co., Ltd.
Itoh Oil Chemicals Co., Ltd.
SHINKAWA Sensor Technology, Inc.
The Honjo Chemical Corporation
Hiroshima City
Miyako Kagaku Co., Ltd.
Toda Kogyo CORP.
Tosoh Corporation
The Chugoku Electric Manufacturing Company, Incorporated
Molten Corporation
Resonac Corporation
Yasuhara Chemical Co., Ltd.
The Sailor Pen Co., Ltd.
Tokuyama Corporation
Nishikawa Rubber Co., Ltd.
SPINGLE COMPANY
Sanwa Shutter Corporation
UBE FILM, LTD.
Seven Rivers Co., Ltd.
Daiki Axis CO., LTD.
Nippon Paint Co., Ltd.
CHUGOKU KOGYO CO., LTD.
WOOD ONE Co., Ltd.
J-POWER Generation Service Co., Ltd.
Japan Marine United Corporation
MAZDA Ace Co., Ltd.
KANEKA CORPORATION
TOHO CO., LTD.
Tsukuba Chemical Co., LTD
Archem Inc.
JGSDF Camp Yonago
Wakunaga Pharmaceutical Co., Ltd.
Kumagai Gumi Co., Ltd.
TODA CORPORATION
KASHIWABARA CORPORATION
Hiroshima Rapid Transit Co., Ltd.
Token Corporation
Nagasaki Inc.
P.S. Mitsubishi Construction Co., Ltd.
HIROSHIMA GAS Co., Ltd.
HIROSHIMA GAS PROPANE Co., Ltd.
Okumura Corporation
PENTA-OCEAN Dredging Co., Ltd.
PENTA-OCEAN Construction Co., Ltd.
MEISEI INDUSTRIAL CO., LTD.

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Main Supplier

Mitsubishi Corporation
Mitsubishi Shoji Chemical Corporation
Chugoku Marine Paints, Ltd.
Mitsubishi Chemical Corporation
ENEOS Corporation
Mitsubishi Gas Chemical Company, Inc.
Japan Pail Corporation
Idemitsu Kosan Co., Ltd.
Shin-Etsu Chemical Co., Ltd.
GUNZE LIMITED
Mitsui & Co., Ltd.
Mitsui Chemicals, Inc.
Asahi Rokazai Co., Ltd.
Toda Kogyo Corp.
ADEKA Corporation
DIC Corporation
Harima Chemicals, Inc.
ITOH OIL CHEMICALS Co., Ltd.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.
Osaka Organic Chemical Industry Ltd.
Asahi Fiber Glass Co., Ltd.
Honjo Chemical Corporation.
JFE Container Co., Ltd.
Nitto Funka Kogyo K.K.
Tokuyama Corporation
Nitinen Co., Ltd.
Tosoh Corporation
AQUAS CORPORATION
Japan Polyethylene Corporation
Japan chemical research Co., Ltd.
CEMEDINE CO., LTD.
DAISHIN CHEMICAL CO., LTD.
Godo Co., Ltd.
Taiyo Solvent Co., Ltd.
Nihon Matai Co., Ltd.
Sumitomo Corporation Europe Limited Milan Office
Honshu Seikan Co., Ltd.
Japan Alcohol Trading Co., Ltd.

Taiyo, Ltd.
Daikin Hydraulic Engineering Co., Ltd.
Daikin Lubrication Products & Engineering Co., Ltd.
Daikin Applied Systems Co., Ltd.
Taiyo Engineering Co., Ltd.
Henkel Japan Ltd., Tokyo
Kuroki Kogyosho
HILTEC Ltd.
Kubota Corporation
Nissei Corporation
Taiyo Koki Co., Ltd.
TLV Co., Ltd.
MARUMA TECHNICA CO., LTD.
Dalian Machine Tool (China)
Dalian JINZHOU Heavy Mach. (China)
Dalian Explosive Working Research Institute (China)
Dalian Heavy Machinery Plant. (China)
CYSCO Co., Ltd. (Korea)
NARA Co., Ltd. (Korea)
WOOSUNG VALVE Co., Ltd.(Korea)
DAEHEUNG COOLER Co., Ltd. (Korea)
SUNG- IL VALVE Ind. Co. Ltd.(Korea)
JUFAN INDUSTRIAL (TAIWAN)
VICOSHIP(VIETNAM)
YUXING PIGMENT(YIXING) CO., LTD
Euro System International Ltd.
Wuzhou Sun Shine Forestry&Chemicals Co., Ltd. Of Guangxi
Qingdao Double-Peach Specialty Chemicals (Group) Co., ltd
Dalian CMEI Co. (China)
ABC Trading Co., Ltd.
Kyushu Toryo Kogyo Co., Ltd.
Nihon Tokushu Toryo Co., Ltd.
Kikusui Chemical Industries Co., Ltd.
Mizutani Paint Co., Ltd.
Sanstar Engineering Inc.
Konishi Co., Ltd.
SK Kaken Co., Ltd.
Ohtsuka Brush Mfg. Co., Ltd.
ARCHITECTURAL YAMADE Corporation

R06.10.25

Table of Contents

SANWA MASSO ROSIN

① **Characteristic :** Usually in Vietnam GUM rosin is made by Cambodian pine resin which is cheap price and low performance.
To improve performance of GUM ROSIN , we changed raw material To Taiwan red pine resin , which is mainly used in China Gum Rosin.

② **Function :** Adhesive, Interface Activation,---Dispersion & Emulsification Emulsifier for Rubber Polymerization, Hydrophobic

③ **Use :** Papermaking Chemicals, ---Sizing Agent, Coating Agent, Paper Strength Agent, Printing Ink, Adhesive, Synthetic Rubber, Paint

④ **Manufacturing Plant :** Founded in VINH CITY at 1994, Employees is 250. Annual Output is 2,000—3,000Ton per one year.

⑤ **Sole Agent Contract :** Photo.1. : Raw material is Taiwan red pine resin

⑥ **Products Appearance :** Photo.2. : Yellowish brown transparent body

独占販売契約書

SOLE-AGENT CONTRACT

MAKER : VINHCONSHIP GROUP、VIETNAM
BAYER : SANWA CORPORATION , JAPAN

1. SCOPE : All Grade of GUM ROSIN, made by Massoniana in the world.
Usually VIETNAM GUM ROSIN is made by Merkusii

2. PRODUCTS NAME : 1. SANWA MASSO ROSIN
2.
3.

3. VALID PERIOD :
From 20 MAY 2020 to 19 MAY 2021 .
If there was no objection to each other, continues automatically

20 MAY. 2020

MAKER
NAME : VINHCONSHIP GROUP
ADDRESS : 249,LE DUAN ROAD, VINH CITY
NGHE AN PRO, SR VIET NAM
PRESIDENT :
TỔNG GIÁM ĐỐC
Nguyễn Duy Kỳ

BAYER
NAME : SANWA CORPORATION
ADDRESS : 3-2 KOONAN 5-CHOME
NAKA-KU, HIROSHIMA,
PRESIDENT : TORU KAWAUCHI
Toru Kawauchi

SANWA CO.
20 MAY '20

(Photo.2) SANWA Masso Rosin

← (Photo.1) Masso Rosin to the world

Materials Properties

	Item		Standard Value	Method
1	Appearance		Transparent Solid	Standard grass color piece rosin
2	Color		Pale yellow	Standard grass color piece rosin
3	Softening Point	100%MASSO	Min69℃	Ring and ball method
		WW-Gr	Min76℃	
4	Acid Value	100%MASSO	Min161	Volumetric method
		WW-GR	Min166	
5	Alcohol insoluble Substance (%)		Max 0.03%	Gravimetric method
6	Unsaponifiable matter (%)		Max 5%	Gravimetric method
7	Ash (%)		Max 0.02%	Gravimetric method

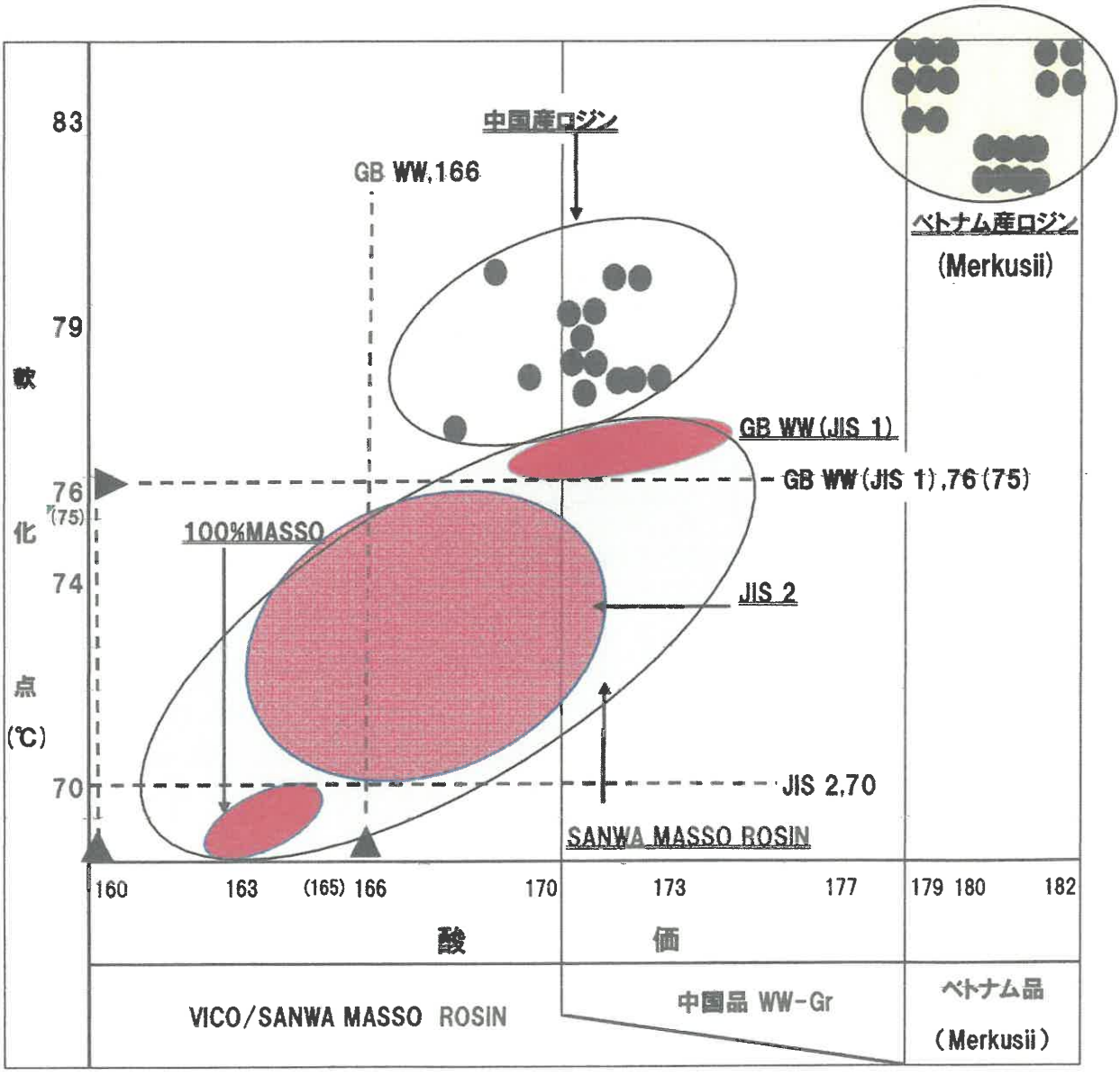

Fig. Acid Value and Softening Point

VICO Factory Overview

Company Name: VINHCONSHIP GROUP Chairman: Mr. NGUYEN DUY SUU (1949)

- Sales & Logistics: NGHE AN CONTAINER JOINT STOCK COMPANY
- Manufacturing: Two factories producing Gum Rosin
  1. HA VINH GUM ROSIN FACTORY: HA TINH PROVINCE,
     MASSONIANA ROSIN: 3,000T
  2. HOANG MAI GUM ROSIN FACTORY: NGHE AN
     MERKUSII ROSIN: 5,000T
     HOANG MAI, INDUSTRIAL PARK,
     Pool Size of Pine Resin: Approx. 500T
     at 2020: 2,000Ton at 2021: 2,500Ton
- Construction: Hotels, schools, etc.

Products:

1. GUM ROSIN WW/X GRADE
2. GUM TURPENTINE OIL
3. ROSIN MODIFIED MALEIC RESIN
4. ROSIN GLYCEROL ESTER
5. ROSIN PRNTAERYTHRITOL ESTER
6. ROSIN RESIN FOR ROAD MARKING PAINT
7. ROSIN MALEATE
8. ROSIN Modified Phenolic Resin

Exclusive Sales Agreement: for Sanwa Masso Rosin: sell via SANWA CORPORATION, Japan
Manufacture: Vinhconship Gr. , Seller: SANWA Co.

Packaging: @225kg/drum on pallet, 4drums/pallet,
20pallets, 80 drums, 18T/20ft Container
@25kg Kraft Bag, 800kg/Pallet 16T FCL

CIF Price: 100% MASSONIANA: USD1,400/T (as of Jun. 2023)
GB WW-Gr / X-Gr: Same as above
100% MERUKUSII: USD1,260/T (as of Jun. 2023)
Validity is one month, We will re-estimate for each inquiry.

Certification Status: ISO9001 Currently in preparation

End

(Revised: January 20, 2025)

Development History of 100% MASSO ROSIN

SANWA CO.

Concerned that Chinese products could disrupt the supply chain, including Beijing's policies, we began immersion evaluation tests at antifouling paint manufacturers 11 years ago to determine whether Vietnamese products could be used in antifouling paints.
Initially, we used Merukusii Rosin, commonly produced in Vietnam. Starting around May and immersing it for one year, the results showed no issues initially. However, around the 10th or 11th month, the amount of barnacle and other fouling organisms adhering increased sharply. As rumored, Merukusii Rosin proved unsuitable for antifouling paint, leading us to conclude this after the sixth immersion test.
The first immersion test with Merukusii began in May 2013 and continued through the sixth test in January 2018, but yielded no good results. Therefore, we purchased Massoniana Resin, not commonly used in Vietnam, at our expense, created a prototype of WW-Gr, and evaluated it. The results showed that even after two summers, the fouling level was nearly equivalent to that of a single summer for the Chinese product. We confirmed that it possessed " confirming it possessed performance "neither inferior nor superior to the current Chinese product." This led to the decision to commercialize it.

The acid value is 162 for 100% Masso and 182 for 100% Merukusii. This difference suggests that lower oxidation levels are advantageous for the durability of anti-fouling performance.
Therefore, we initially considered expanding sales of two products: a high-performance 100% Masso Rosin product and a standard WW-Gr product comparable to Chinese products. However, after various discussions and deliberations, we determined that commercializing the high-performance product would be difficult and decided to focus solely on the WW-Gr product with an acid value of 170, comparable to Chinese products.

In China, since the establishment of the current GB standard, likely around 1990, X-Gr has been effectively unified with WW-Gr, with an acid value of 166 and approximately 10% Merukusii mixed in. In Japan, the low-acid-value JIS Grade 2 specification remains on paper, but I believe it no longer exists in practice. Around 2010, Chinese products had an acid value of 172, suggesting they already contained about 50% Merukusii. Therefore, we considered a Merukusii and Massoniana blend similar to China's approach. However, we abandoned this due to the difficulty of separating them within a single factory for production management reasons. Instead, we instructed the factory to achieve a higher acid value by changing the distillation conditions.
When only fragmented words remain in one's memory, there were likely many points that seemed contradictory at times. I apologize for the lack of explanation.

This product is a joint development between VICO and our company, and we have also concluded the attached SOLE AGENT CONTRACT. Therefore, if you wish to purchase it, please do so through our company.

Sincerely,

Fluorspar Substitute Material: Sanwa Alumina

SANWA CO.

1. Introduction

Heroult furnaces are being reevaluated as alternative steelmaking equipment to blast furnaces and converters. Diffusion deoxidation, introduced from Europe alongside equipment as a German-style melting process, remains the mainstream steelmaking method today. By using AL2O3 as a slag-forming raw material in this new steelmaking process, which eliminates the need for fluorite used to improve the fluidity of carbide-based slag, significant improvements in on-site workability can be achieved. This leads to substantial rationalization of the steelmaking process, including cost reductions through improvements in power consumption per unit and refractory consumption per unit, and a 25% reduction in TAP-TO-TAP time.

2. Differences Between Carbide-Based Slag and Alumina-Based Slag

The primary difference between conventional $CaO-MgO-FeO-SiO_2$ slag and $Al_2O_3-CaO-SiO_2$ slag lies in their melting temperatures.

Carbide-based slag melts at approximately 1550° C, while alumina-based slag melts at a lower temperature of around 1350° C, making it easier to form slag. Carbide-based slag is highly temperature-sensitive, fluctuating between a watery, flowing slag and a hard, cracker-like slag. It requires extensive use of expensive additives like SIC and carbon powder, plus costly fluorspar as a softener. If it becomes watery, carbon and silicon pick-up accidents occur easily. Maintaining stable, moderate fluidity is difficult. The thin slag layer causes the electrode arc to strike the molten steel directly, generating significant noise. Nitrogen and hydrogen gas absorption increases. The furnace body and roof refractories are directly exposed to electrode discharge and heating. The furnace sections where watery slag flows extensively suffer severe melting damage. The frequent post-tapping repairs are harsh for workers and incur substantial repair material costs.

Alumina-based slag has a low-melting-point range around 1350° C, making it easy to form a slag layer. The slag itself can also become foamy slag through forced deoxidation using materials like aluminum dross powder. Within this foamy slag, the electrode arc discharges, significantly improving thermal efficiency with low noise. Furthermore, the slag splatters onto the furnace refractories, forming a protective layer that extends the lifespan of the furnace body and roof refractories. Additionally, carbon and SIC, which are spread on the slag as deoxidizers, are less likely to come into direct contact with the molten steel, reducing the risk of carbon and silicon pickup accidents. This slag system is highly effective for steelmaking operations, offering benefits such as reduced power consumption per unit, extended refractory life, drastically reduced slag line melting loss, and stable carbon and silicon percentages in molten steel.

3. I believe that the larger the factory, the more likely it is to adhere to the classical steelmaking process described in textbooks—specifically, diffusion deoxidation using German-style carbide slag. Alumina-based slag offers significant advantages not merely by changing the raw material composition of the slag, but by simultaneously advancing the entire steelmaking process.

Our company can provide this specific solution to users of this product.

4. Packaging consists of kraft bags at 25kg each, shipped on pallets in 1-ton units.

We will collect waste materials with an alumina purity of 80% or higher, such as ceiling bricks from your electric furnace, for a fee.

⑲日本国特許庁(JP)　　⑩特許出願公告

⑫特許公報(B2)　昭56-11367

⑤Int.Cl.³	識別記号	庁内整理番号	㉔㊹公告　昭和56年(1981)3月13日
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//C 04 B 35/10		7417-4G	

（全4頁）

1

⑤④造滓材

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㉒出　願　昭53(1978)2月2日
公　開　昭54-103717
㊸昭54(1979)8月15日

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⑤⑦特許請求の範囲

1　破砕、粒度調整した使用済み高アルミナ系耐火材料を主成分として含むことを特徴とする造滓材。

発明の詳細な説明

本発明は使用済みの高アルミナ系耐火材料を造滓材として用いることに関するものである。

従来の造滓材の材料としては蛍石が用いられていたが、エルー炉による製鋼のための蛍石は全量を輸入に依存しており、埋蔵量の絶対量の低下などのため価格が上昇していたり、蛍石の使用は弗素という有害元素の発生を伴い公害を引き起こすし、また蛍石を使用した場合、製鋼用滓は水状となり易く保温効率が悪い上に、蛍石系滓は平衡酸素量が高く溶鋼からの脱酸、脱硫に不利であるという欠点があつた。この蛍石に代つて、アルミニウム電解精錬の際に発生するフユームダストやアルミニウム溶解の際に発生するアルミドロスを主成分としたアルミ灰系スラグを造滓材として用いることも知られているが、アルミ灰中のアルミニウムは窒化物となつており、このままで使用すると鋼に対し有害のため何らかの脱窒素処理が必要であつたり、アルミ灰はあまりにメッシュが小さいので吸湿性が著しく、鋼の品質上不利であつたり、更に量的にも制約があるという難点があつた。

2

本発明者等はエルー炉製鋼のコスト低減、品質向上の必要性から、これら蛍石、アルミ灰に代る造滓材を探していたが、製鋼用滓として有効であることが既に知られているアルミナ系スラグに注目した。

アルミナ系スラグの最大の問題はそのアルミナ源を何に求めるかであり、アルミナを製品として購入し、それを造滓材として活用しようとすれば非常に高価なものについてしまう。安価なアルミナ源を探した結果、高アルミナ系耐火材料は、その原料が高価なものであるにもかかわらず従来は廃却しており、この耐火材料はその耐火性の故に使用前、使用後に変化しているのは形態のみで、その組成には根本的な変化はない点に着目して本発明を完成したものである。即ち、本発明は使用済み、廃却前の高アルミナ系耐火材料を破砕、粒度調整し、これを主成分とする造滓材に関するものである。粒度は、あまり大きいとエルー炉内の投入時に不都合であり、また投入後、溶融スラグ化する時間が長びくため、最大約55㎜φとする。

高アルミナ系耐火材としては定形、異形煉瓦、不定形耐火物等のうち高アルミナ系のものは全て使用され、高アルミナ系エルー炉天井煉瓦を本発明では主に使用した。高アルミナ系耐火物は種々の分野で使用されているが、その製造段階における品質管理は充実しており、またその量的な豊富さにおいてもアルミ灰に比べ有利である。本発明の造滓材は製鋼用、エレクトロスラグ用、溶接用、E・S・R用(CaOを混合したものも含む)等に用いることができる。

例

第1表に示すアルミナ煉瓦を破砕機(圧力10 Kg/cm²のエア・シリンダ使用、処理能力300 Kg/hr)で最大径約55㎜に破砕して第2表に示すような造滓材をつくり、還元期造滓材として使用した。

（付帯資料）

1．開発経緯

50 年近く前に三菱広島の事業計画で中・小型鍛造品のブルームの内製化に向けて 製鋼一造塊一鍛造熱処理技術の統合確立の為に 三菱 Gr 内の三菱製鋼深川で既に実用化されていたアルミナ系スラグの技術を習得し 同時に真空脱ガス炉や中型鍛造プレス機の導入も進みました。私は広島の製鋼担当として深川で実地指導を受けました。アルミナ系スラグは材料系を見直し広島で実用化し昭和 56 年に特許が成立し一般企業にも実施許諾し 国内の複数の鋳物工場で活用されて居ます。本特許は既に公知化された技術で 省エネ・コスト低減効果が大きいので 是非貴社でも御活用頂きたいと思います。

2．製鋼プロセスの全体的な見直し

三菱広島の鋳鋼工場には当時 5・15・20t の 3 基のエルー炉が稼働して居ました。20T 炉は呉の海軍工廠から戦後移管され 炉体には米軍機の機銃掃射の跡が残っていた。技術員や作業員の多くは海軍工廠の人達でした。製鋼法はドイツ式のカーバイドスラグで拡散脱酸するオリジナルなプロセスが守られて居ました。

3．迅速な製鋼法の確立に依る効果

溶解・酸化期や還元期を短縮する事が出来れば電力原単位や耐火物原単位の低減効果は勿論 Tao To Tap の短縮で生産量の上乗せが 特別な生産設備の新設無しで達成出来ます。

例えば溶解・酸化期の短縮方法としては(1)積極的な酸素カッチングの撹拌効果でスクラップの溶落ちの効率化や (2)吹落とし炭素量の管理と酸素吹精の強化に依る溶解期の短縮と十分な昇温 (3)溶解末期の十分な温度確保で徐滓・造滓に依る温度低下無しで還元期に入る操業をする。

又 還元期の短縮方法としては (1) 還元期中は積極的なアーク加熱はせず下げ熱で保持し溶鋼面を安定させ (2) 溶鋼の迅速な還元の為に 還元スラグと溶鋼の界面の拡散脱酸だけでなく アルミインゴットを溶鋼中に差し込み強制脱酸を行う (3) スラグの脱酸には主にアルミのダライ粉やチップをスラグ上に均一に散布する (4) 泡状スラグの形成に依るアーク熱効率の改善と 炉体天井煉瓦の保護、出鋼後の炉内補修作業を最小限にする。——等が考えられます。

上記の様な改善活動を進める上で低融点で作り易いアルミナ系スラグは必須です。スクラップ装入の時に塊状アルミナと石灰石を炉底に敷く等して 炉内のアルミナ系スラグへの置き換えを進める事も短期間でのエルー炉の安定操業確立の為に必要です。

私は20T 以上の大型炉の操業方法を知りません。広島でのアルミナ源としては電炉に使っている天井煉瓦の廃材を破砕して造滓材として流用し Al2O3 量の全体収支はバランスして居ました。

アルミナ源の商品としては 中国で破砕・整粒し袋詰めした商品を提供させて頂く予定です。

蛍石は益々純度が落ち輸出規制の対象に成る恐れも有ります。対応策の1方法として本法は貴社の製鋼工場改善のお役に立てると思います。 （三和商会担当 ： 川内・白井）

SANWA THINNER (From 2010)

	Product Name	Main Components	Uses・Features	OEM
For Cleaning Steel	SANWA CLEAN N	Ethanol + Methanol + Normal propyl alcohol	Under the jurisdiction of METI, MHLW Non-applicable product for PRTR, Ordinance on Prevention of Organic Solvent Poisoning, and of Hazards Due to Specified Chemical Substances Not-including Class1 and 2 Low irritation and high cleaning power Exhaust blower filter	D Co.
	SANWA CLEAN A-2	MCH + Diacetone alcohol + Others	Under the jurisdiction of METI, MHLW Non-applicable product for PRTR, Ordinance on Prevention of Organic Solvent Poisoning, and of Hazards Due to Specified Chemical Substances Not-including Class1 and 2 Low-odor product For removing antirust oil and machine oil Iron and Steel machinery, Compressor Assembly	D Co.
	SANWA CLEAN A	Dimethyl carbonate + MCH + Others	Under the jurisdiction of METI, MHLW Non-applicable product for PRTR, Ordinance on Prevention of Organic Solvent Poisoning, and of Hazards Due to Specified Chemical Substances Not-including Class1 and 2 For Cleaning piping jig in painting factories.	D Co.

Special Notes

(1) As non-applicable product, MCH and Normal propyl alcohol are used.

(2) SANWA Clean A-2 does not fall under the Ordinance on Prevention of Organic Solvent Poisoning in the Industrial Safety and Health Law.
There is no control concentration (ppm) set for exposure prevention and protective measures.
In the workplace, work related to working environment measurement is reduced.

(3) As the product does not fall PRTR Law under the jurisdiction of METI, there is no obligation to ascertain the amount when it is discharged or transferred, and to report it to the government.

Other Products:For cleaning rubber and glass parts, For General Dilution

For Cleaning	SANWA THINNNER MK-A	MCH + IPA + Others	For cleaning rubber parts	D Co.
	SANWA THINNNER M-PG	MEK + PGM + Others		
	SANWA Lacquer Thinner T	Toluene + Xylene + PMA-P + Others	For cleaning glass parts	T Co.
For General Dilution	SANWA THINNER #10 For lacquer	Toluene + Methanol + Others	General Paint Factories	D Co.
	SANWA THINNER For epoxy	Toluene + Xylene + Others		
	SANWA THINNER For chlorinated rubber	Xylene + Solvess + Others		
	SANWA THINNER For urethane	Toluene + Xylene + Others		

Notes:

1)Upon request, we can adjust the ingredients to create a standard product just for your company.

2)If the order is less than 20 cans, we will charge the actual cost.

Revised) R06.03.13

Comparison table of cleaning solvent properties

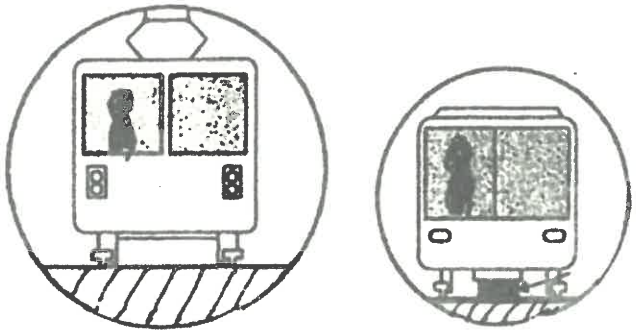
	Solvent name	Halogenated hydrocarbons			Water-Alcohol	Hydrocarbons		
		Fluorocarbons (CFC-113) CCl2F-CClF2	1,1,1-Trichloroethane CH3CCl3	Dichloromethane (MDC) CH2Cl2	Isopropanol (IPA) (CH3)CHOH	NS Clean 200	NMP 1-Methyl 2-Pyrrolidone	TAIYOSOL M
Basic Physical Properties	Specific gravity	1.567	1.333	1.326	0.786	0.745	1.027	0.799
	Molecular weight	187.38	133.41	84.9	60.1	–	99.14	–
	Boiling point (℃)	47.6	74.1	39.8	82.4	191～207	204	215～260
	Melting point(℃)	-35	-32.6	-95.1	-89.5	-22.5	-23	Below 0℃ (solid at room temperature)
	Viscosity (20℃) (cp)	0.701	0.774	0.441	2.39	1.66	1.65	3.3
	Surface tension (20℃) (dyne/cm)	18	25.56	28.2	–	24.9	41	24.6
	Specific heat (20℃) (cal/g℃)	0.213	0.255	0.28	0.61	0.52	0.04	–
	Latent hear of vaporization (boiling point) (cal/g)	35.07	53.8	78.7	163	–	105	–
	Evaporation pressure (20℃) (mmHg)	272	100	349	32.4	–	0.3	–
	Solubility in water (g/100g-water)	0.017	0.44	1.4	∞	–	∞	Slightly soluble in water
	KB value	31	120	136	–	–	Over 200	–
	SP value	–	8.5	–	–	7.8	–	–
Safety	Flash point (℃)	None	None	None	12～21	70	95	86
	Ignition point (℃)	–	–	662	620	–	346	–
	Combustion concentration range (%)	–	–	13～22	2.0～12	0.7～5.5	0.9～3.9	–
	Allowable concentration (ppm)	500	200	100	400	–	–	–
	Fire Service Act (MIC)	N/A	N/A	N/A	Class 4 Alcohols	Class 4 Petroleum No.3	Class 4 Petroleum No.3	Class 4 Petroleum No.3
	Designated quantity	–	–	–	400L	2,000L	4,000L	2,000L
	Ordinance for the prevention of organic solvent poisoning (MHLW)	N/A	Class 2 Organic solvent	Class 2 Organic solvent	Class 2 Organic solvent	N/A	N/A	N/A
	PRTR Law (METI)	Class 1 Designated chemical substances	Class 1 Designated chemical substances	Class 1 Designated chemical substances	N/A	N/A	–	N/A

(Date: H27.07.06)

Examples of Explosive Clad Material applications

1. Cu/SS, AL/SS Clad

In conventional subways, trains draw electricity from pantographs on the roof, but on the O-edo Line, Cu Clad or Al Clad is placed between the tracks to draw electricity from the floor of the train.
This method significantly reduces the cross-sectional are of the tunnel to less than half, and the cost of subway construction can be significantly reduced.



The black part between the tracks is Cu/SS Clad

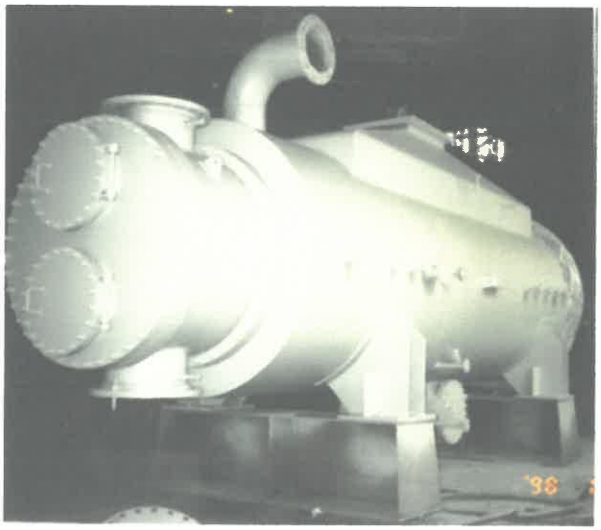
2. Al/Ti/Ni/SUS Clad

Ships used to transport LNG are equipped with Al tanks, which are welded to the structural carbon steel of the hull, because direct welding is not possible to secure the tanks, the Al tanks are connected to the hull with a four-layer composite material of Al/Ti/Ni/SUS.

LNG Ship (MHI Technical Report)

3. SUS/SS Clad

To reduce the material costs of large SUS tanks, there are large composite pressure vessels in which only the inside of the tank, which requires heat and corrosion resistance, is made of SUS, and the outside is made of inexpensive carbon steel.



Large pressure vessel

SUS/SS Clad (3+82)x2500 x12000mm

AUTO VALVE WITH CONTROL FUNCTION

SANWA CORPORATION

GOAL: Improve efficiency of Maintenance Work by Advance arrangement & Unitization
Reduce procurement work, Measures not to reduce skilled workers at site

PRODUCT NAME : Automatic Butterfly VALVE WITH CONTROL Function (Wafer Type)

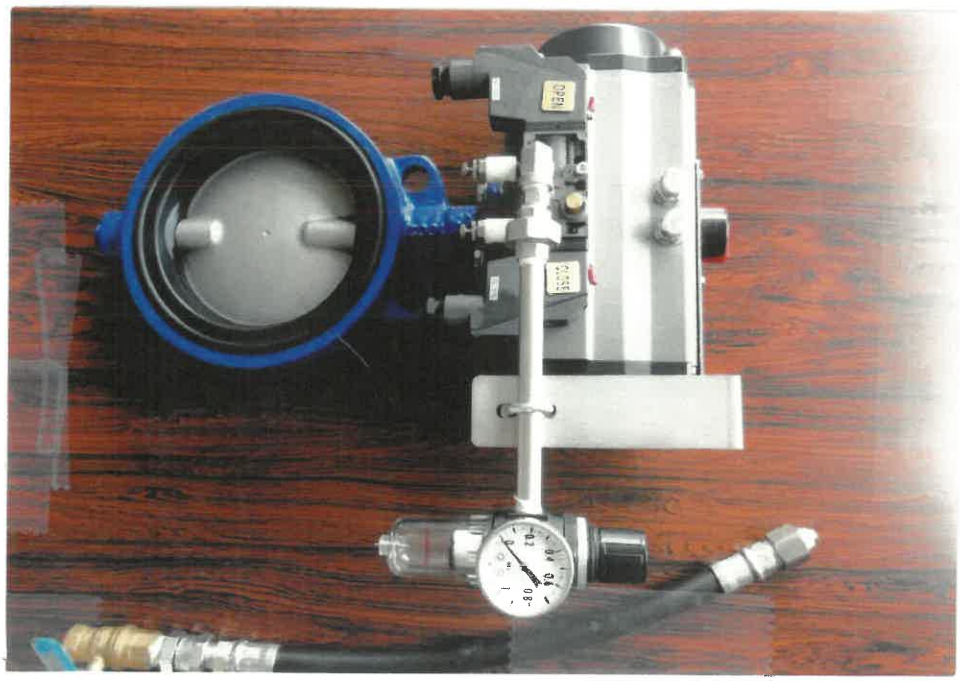
SPEC. : JIS16K-50A, 65A, 80A, JIS 10K-100A, 150A, 450A

Features: ① VALVEs & CYLINDERs are made in Korea or Taiwan with proven records for steelmaking.

② Control systems such as Solenoid valves with bypass function are made in Japan.

③ Auto Valves and control products are quality guaranteed by each manufacturer.

④ Delivery is made after checking that there are no leaks in the connections after the entire assembly.



150A Butterfly Valve (before shipping)

NEW PRODUCT ···AUTO VALVE WITH CONTROL FUNCTION

SANWA CORPORATION

GOAL: Improve efficiency of Maintenance Work by Advance arrangement & Unitization
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150A Butterfly Valve (before shipping)

Sales Record of Cylinders made in Taiwan

SANWA CO.

Process	Equipment name / Installation position	Quantity	Model/Pressure/ Pressure resistance (MPa)	Inner Diameter Rod diameter (mm)	Stroke/Total length (mm)
Hot Rolling	F1-3 WR Chock Clamp	15	Hydraulic 21 31.5	Φ63 Φ35.5	170 644
	Intermediate Roll IMR Hook BOT	7	Hydraulic 21 31.5	ϕ50 ϕ28	100 878
	F7 WR For Clamping	4	Hydraulic 14 21	ϕ63 ϕ35.5	140 654
	FSB Descaling Pinch roll swing	2	AIR 0.7 1.4	Φ280 Φ63	310 81
	Intermediate Roll IMR Hook TOP	8	Hydraulic 21 31.5	ϕ50 ϕ28	100 776
	FSB Pinch roll For lifting	22	AIR 1 1.5	Φ250 ϕ63	180 81
	Rolling CS Chute change	2	Hydraulic 21 31.5	ϕ160 ϕ90	700 1431
	2SF Charge ram	2	Hydraulic 21 31.5	ϕ150 ϕ80	300 1013
	2 Hot rolling Turntable lock	4	Hydraulic 21 31.5	ϕ100 ϕ56	181 854
	Hot rolling Spindle support	4	Hydraulic 21 31.5	ϕ140 Φ110	435x50 1985
	2 Hot rolling F1-6 Stripper retract	2	AIR 0.7 1.4	ϕ280 ϕ63	310 74
	Hot rolling finishing For keeper plate	1	Hydraulic 21 31.5	ϕ63 ϕ35.5	50 524
	Hot rolling F1-6 BUR For Clamp	2	Hydraulic 21 31.5	ϕ80 ϕ45	90 583
Steelmaking	Exhaust gas cooling recovery For skirt lifting	4	Hydraulic 14 21	ϕ100 ϕ56	110 480
	Degassing equipment Sub-material discharge gate	1	AIR 1 1.5	ϕ125 ϕ40	304.5 545
	Degassing equipment Sub-material discharge gate	1	AIR 1 1.5	ϕ125 ϕ40	307.5 545
	Hearth For rotating chute	1	AIR 1 1.5	ϕ200 ϕ50	500 78

Others	For heating equipment Fuel extrusion cylinder	2	Hydraulic	14	21	ϕ200 ϕ100	600	1315
	For volume reduction equipment Pressurization machine	1	Hydraulic	21	31	ϕ140 ϕ100	1340	1678

VOC Control Device

R05-7-04

Type	Character
Rotary Accumulate Burning Type * Draw.	1. Honeycomb Ceramics—big surface porous area, heat resistance and chemical stability will be used effectively for Adsorption VOC and Accumulate energy character. 2. Adsorption of Volatile Organic Compounds (VOC) gas at room Temp. .~Vaporization at 180℃. ~Burning Separate to CO2 & H2O , at 800-950℃and Accumulate. 3. At the start up of operation, you have to use Gas Burner about 100minutes, and almost of operation term you can stop burner , because of Burning Energy can reuse for Vaporization by Accumulate character.
Active Carbon (Fluidized Bed)	1. High strength granular Active Carbon can use in fluidized condition. This means almost surface area of carbon can use effectively. 2. Solvent will recovered 10kg/Hr ,in the case of 900N m^3/min. 3. How to handle Recovered Solvent is another new problem. 4. Granular Active Carbon is made by KUREHA' s Patent.
Active Carbon (Fixed Bed)	1. VOC gas will pass easy route in Carbon grain mass. This means a little surface of Active Carbon grain is effective and almost is ineffective. 2. Usual Active Carbon will be smashed easily, so that can' t use in Fluidized Condition. 3. It needs big type of a Drainage Disposal Equipment, very expansive.

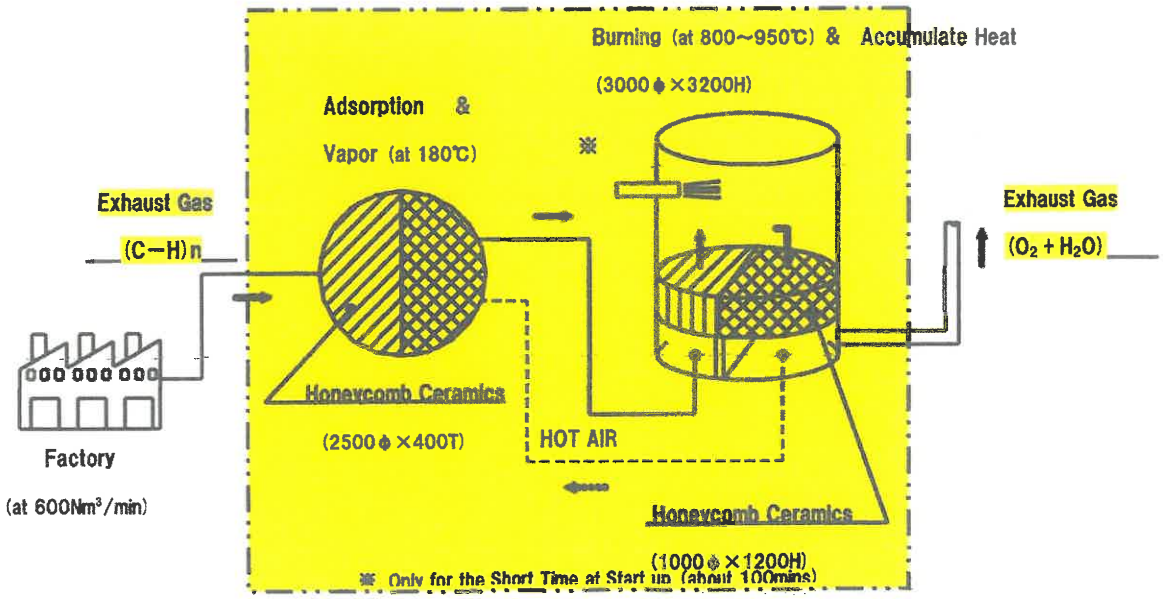

Fig. VOC Control Device

Comparison chart of Volatile Organic Compounds countermeasure equipment

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	Proposed method	Improved method	Conventional method
	Rotary type Heat storage combustion method (Company KON) 600N ㎥/min	Activated Carbon Fluidized bed type (Company KURE) 900N ㎥/min	Activated Carbon Fixed bed type
Features	・Uses ceramic honeycomb ・Produces carbon dioxide and water through adsorption, separation(180℃) and oxidative decomposition(750℃). ・Requires preheating with LPD for about 100 minutes. Energy-saving by effectively utilizing the oxidation heat of exhaust gas during operation. ・Operating temperature : 800-950℃	・High-strength spherical activated carbon that is difficult to crush is used while stirring, increasing the amount of activated carbon used for VOC adsorption. ・Recovered solvent 10kg/Hr ・Nitrogen circulation type 0.7 ㎥/Hr ・Treatment for recovered solvent becomes a new issue in industrial waste treatment.	・Gas passages are unevenly distributed, limited the surface area of the activated carbon that can be effectively used to adsorb VOCs. ・The activated carbon is weak, and when stirred it breaks down, causing poor breathability. ・A large-scale investment is required for water treatment facilities, and if the solvent is to be recovered, this poses new industrial waste treatment issues.
Initial cost Main equipment cost	Unit: 85 million yen No water treatment facilities required	Unit: 100 million yen No water treatment facilities required	Unit: 70 million yen (Water treatment facilities: 100 million yen)
Running cost Consumables	12.5 million yen (5 years) Fireproofing material / Cylinder	6 million yen (5 years) Activated carbon: 3,900 yen /kg (Recycled product: 2,800 yen)	17 million yen (5 years) twice a year 51 million yen (5 years) Six times a year (28 cartridges for 6 million yen twice a year) Activated carbon: 300 yen /kg
Total cost over 5 years	97.5 million yen (81)	106 million yen (88)	87 million /121 million yen (100)
Equipment dimensions Equipment weight	16L x 6W x 6.7mH 24ton	9L x 6W x 6.5mH 25ton	———

(Date: 1.30, 2025)

The end

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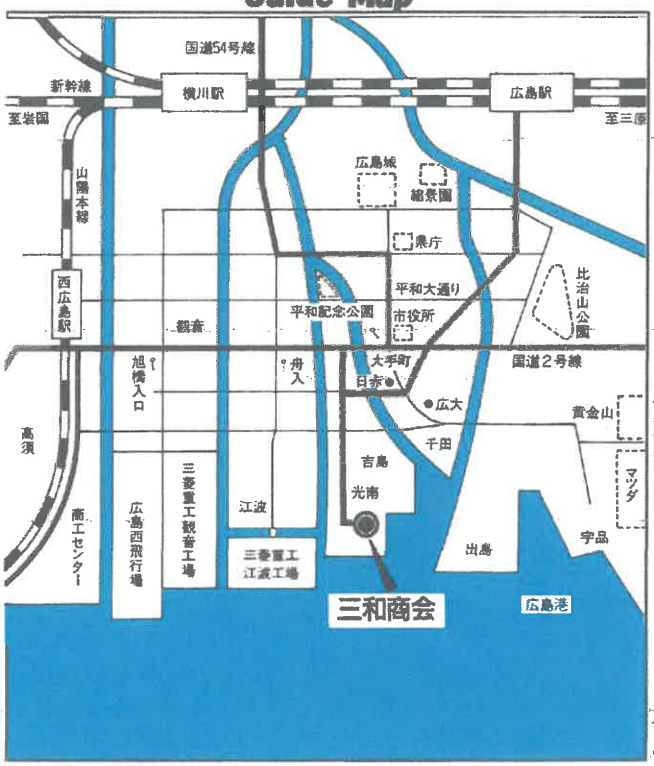
Guide Map



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Transportation

About 30 minutes from Hiroshima station by bus(bound for Yoshijima Eigyousho) and 5 minutes walk after getting off at Minamiyoshijima.

About 20 minutes from Hiroshima Station by Taxi
Get off at in front of Yoshijima Okunai Pool or the building of "SEINO UNYU"