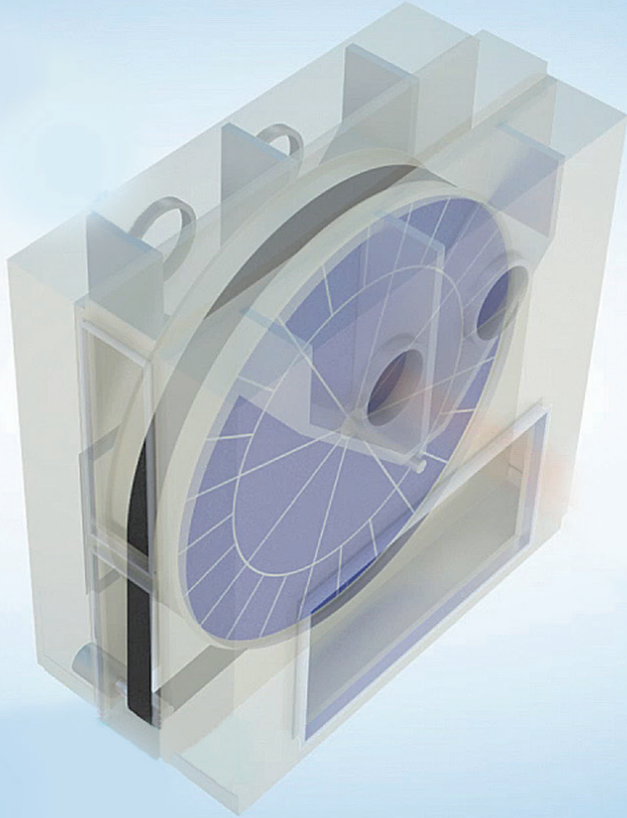


TOMBO™ BRAND

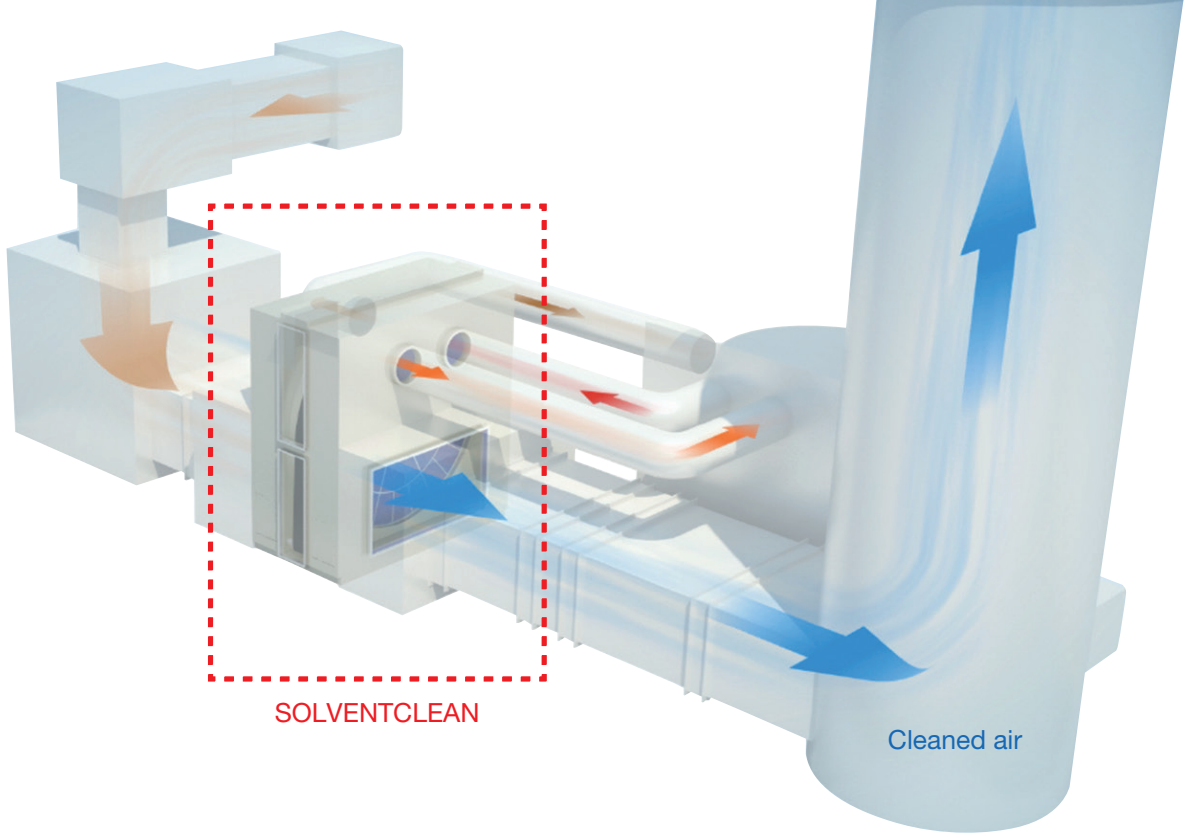
Apr. 2024

SOLVENT CLEAN™



Overview

Factory exhaust gas containing VOC

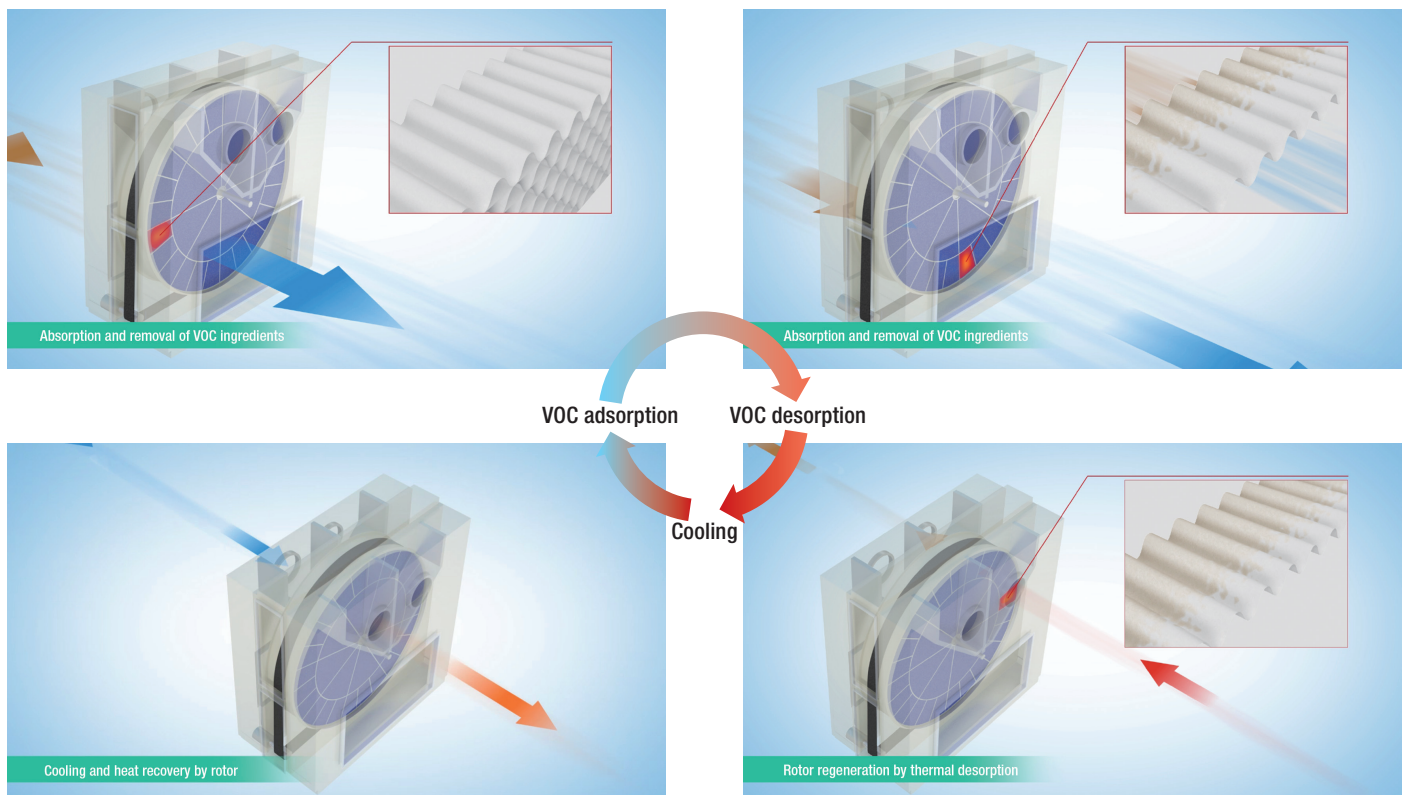


These days, with atmospheric pollution becoming a problem of global proportions, emission regulation of VOC⁽¹⁾ is being strengthened and interest in VOC processing technologies is increasing.

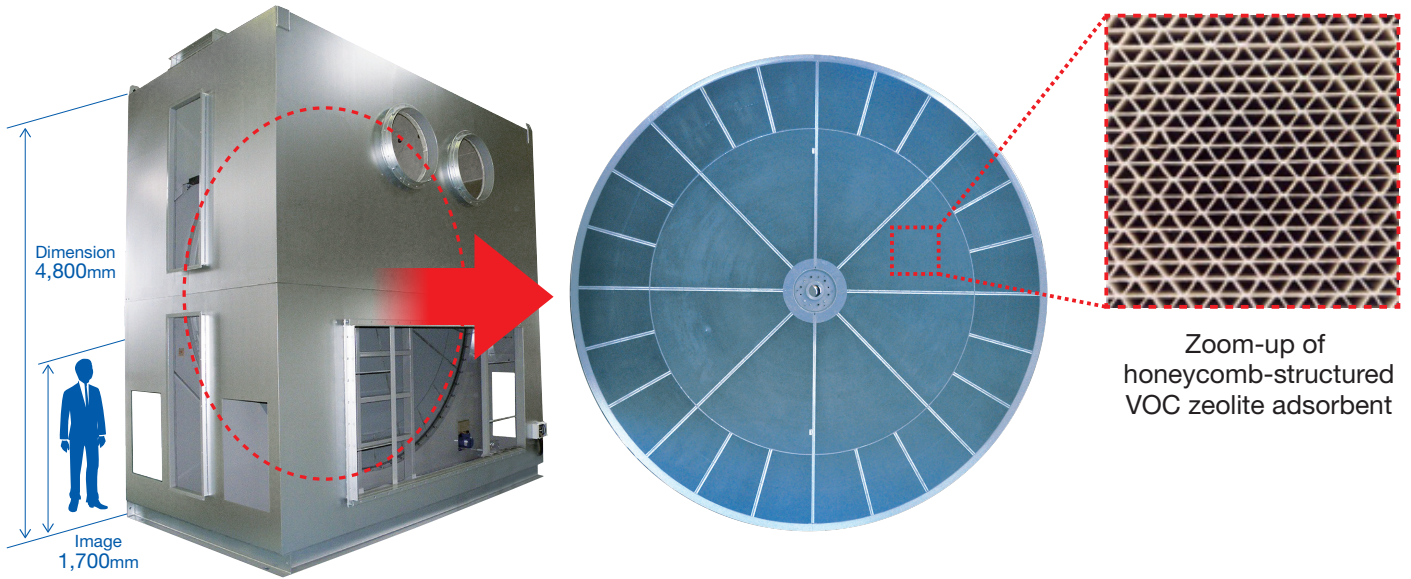
Up till now, when processing exhaust gases in large air volumes containing low concentrations of VOC, large-scale equipment has been required, greatly increasing both initial and running costs.

By using SOLVENTCLEAN, exhaust gases in large air volumes containing low concentrations of VOC, which have caused difficulties in the past, can be concentrated into low air volumes with high concentrations and, by combining SOLVENTCLEAN with existing (oxidization method, recovery method, etc.) processing equipments, efficient processing of exhaust gases containing VOC has become possible.

Note(1) VOC : volatile organic compound



**"TOMBO" is registered trademark or trademark of NICHIAS Corporation.
* Names with a TM symbol are trademarks of NICHIAS Corporation.



SOLVENTCLEAN

VOC concentration rotor

Structure	Honeycomb structure
Adsorbent	High performance hydrophobic zeolite
Standard desorption temperature	180 – 200°C
Temperature for high temperature desorption function (as option)	300°C

Features

<p>1</p> <p>Can provide a low operation cost</p> <p>SOLVENTCLEAN is suitable for a large airflow volume and low concentration of exhausted gas removal, and can save the operation cost for whole VOC removal system.</p>	<p>2</p> <p>Can provide high VOC removal efficiency</p> <p>99% of VOC removal efficiency can be achieved.</p>	<p>3</p> <p>Can provide high concentration ratio</p> <p>Increase of VOC concentration in the exhaust gases multiplied by 3 to 30 times is the service available. (Normally the concentration limit is 1/4 of LEL [lower explosion limit] as standard design guideline.)</p>	<p>4</p> <p>Can provide low pressure loss</p> <p>Due to the usage of honeycomb-structured adsorbent, pressure loss is low and large airflow volume of VOC exhausted air is removal with minimizing the increase of operation power in the process fan.</p>
<p>5</p> <p>Can provide the continuous removal for VOC</p> <p>Since SOLVENTCLEAN uses a continuous desorption by unique rotation technique, the removal efficiency is relatively stable in comparison with traditional batch type concentration, and is not fluctuated.</p>	<p>6</p> <p>Can remove high boiling point of VOC</p> <p>Solventclean is suitable for a large airflow volume and low concentration exhausted gas removal. It can save the operation cost for whole system.</p>	<p>7</p> <p>Incombustible</p> <p>All raw materials for which the rotor is constructed are inorganic and the rotor is uncombustible.</p>	<p>8</p> <p>Maintenance is easy</p> <p>Since the construction of the rotor is simple, maintenance is easy.</p>

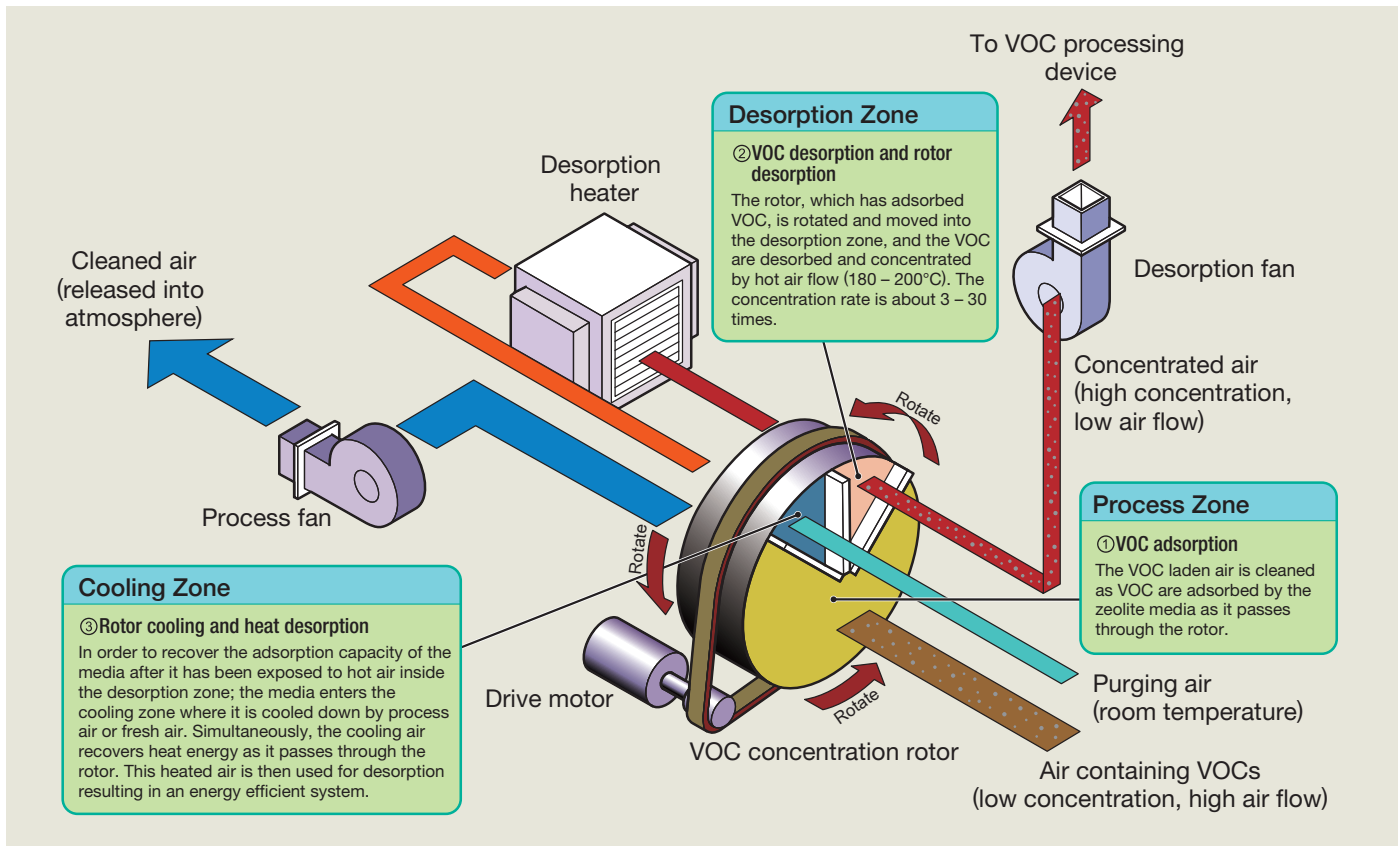
Zeolite Select for Typical VOC

	VOC	Rotor Type				
		HZ-AM	HZ-BM	HZ-BO	HZ-XM,XO	HZ-BX
Aromatic compounds	Toluene	B	A	A	B	A
	Xylene	A	C	C	A	B
	Tri methyl benzene	A	D	D	A	C
	Styrene	D	A	D	D	D
Ketones	Acetone	C	B	B	B	B
	MEK	B	A	A	A	A
	MIBK	B	A	A	A	A
	Cyclohexanone	A	C	A	A	B
Esters	Ethyl acetate	B	A	A	A	A
	Butyl acetate	B	A	A	A	A
	PGMEA	B	A	A	A	A
Alcohols	Methanol	C	C	C	C	C
	Ethanol	C	B	A	B	B
	IPA	C	B	A	B	B
	Butanol	B	A	A	A	A
Others	Naphtha ⁽¹⁾	B	C	C	B	B
	NMP	A	B	B	B	B
	DCM	D	B	C	C	C
	DMSO	A	B	B	A	B
	HMDS	A	D	D	A	B

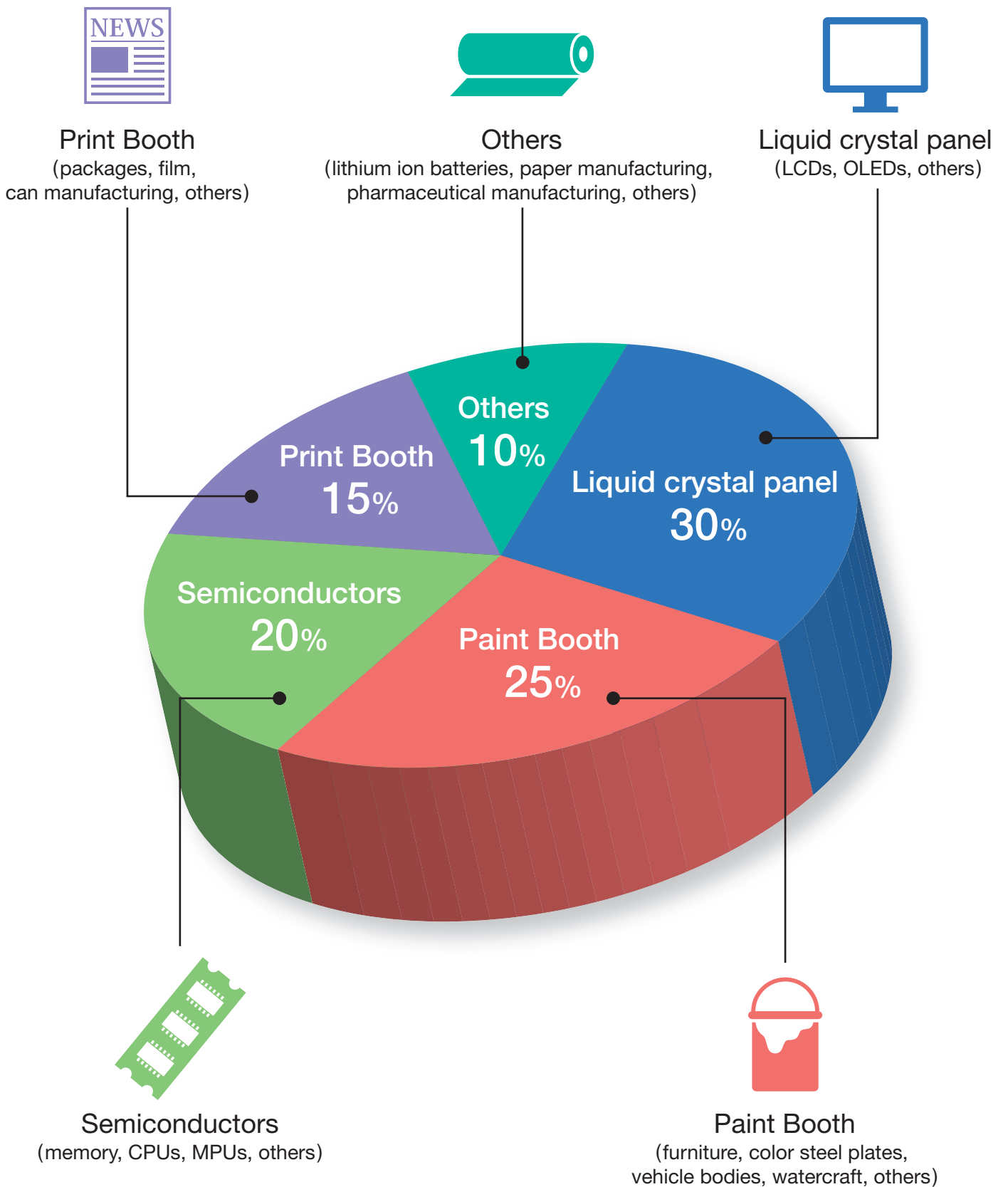
Performance : A (excellent), B (good), C (possible), and D (not possible)

Note(1) : Boiling point less than 200°C

Basic System



Sales Performance



Number of supplied SOLVENTCLEAN : more than 3,000
(as of Oct, 2023)

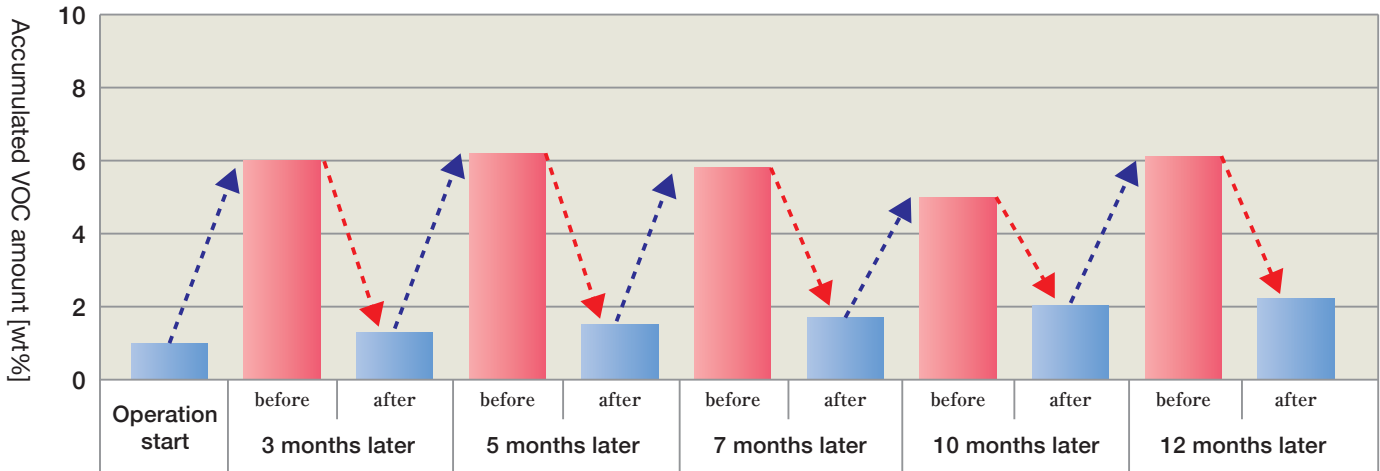
High Temperature Desorption System

Features

A system that periodically conducts a “300°C desorption operation (high temperature desorption operation)” to desorb accumulated high boiling point substances and prolong the life of the rotor. The 300°C compatible sealing material is a mechanism that is unique to Nichias.

Usage results

Purposes : Semiconductor and liquid crystal panel production line exhaust gases, photogravure print drying exhaust gases, chemical production line exhaust gases, etc.



Behavior of remaining organic matter amount reduction by periodic high temperature desorption

Measurement organization : NICHIAS

*These are measured values and not guaranteed values



Precautions regarding use

This system is for eliminating organic matter that has accumulated on the concentration rotor, not for recovery of the rotor to its original state.

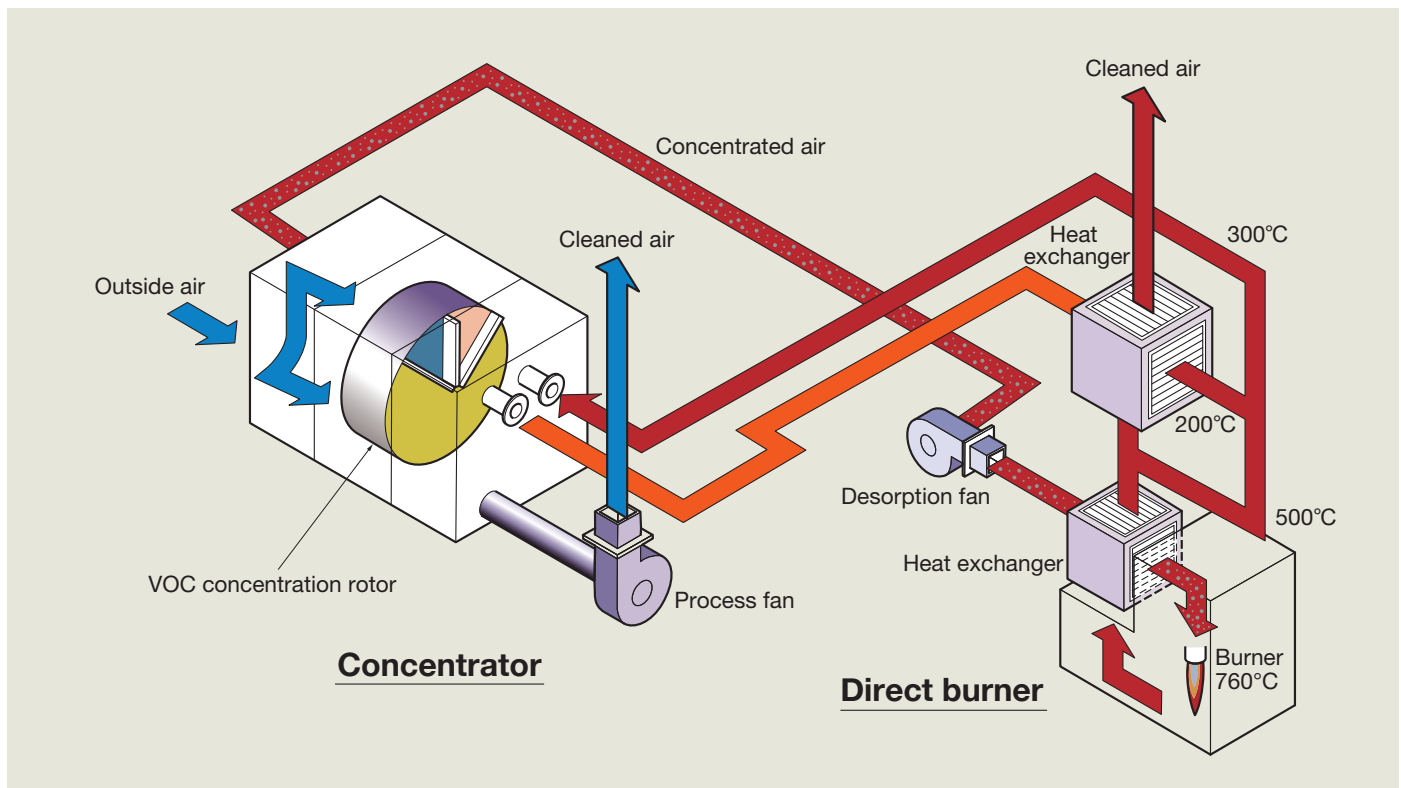
The necessity for a mist filter (activated carbon etc.) to be installed at the stage prior to the concentration rotor is fundamental.

If ingredients that cannot be eliminated by high temperature desorption (generation temperature of 300°C) are included, the concentration rotor does not recover. Also, this system cannot respond to all substances with a boiling point of or below 300°C.

There are cases where this system cannot be applied, depending on conditions (such as large amounts of high boiling point materials etc.).

The desorption outlet temperature rises to about 250°C, therefore it is necessary to select ducts, sealing materials, and fans that are suitable for that temperature.

〈During high temperature desorption〉



Examples of Combinations of Concentrators with Various Systems

Concentrator with oxidization system

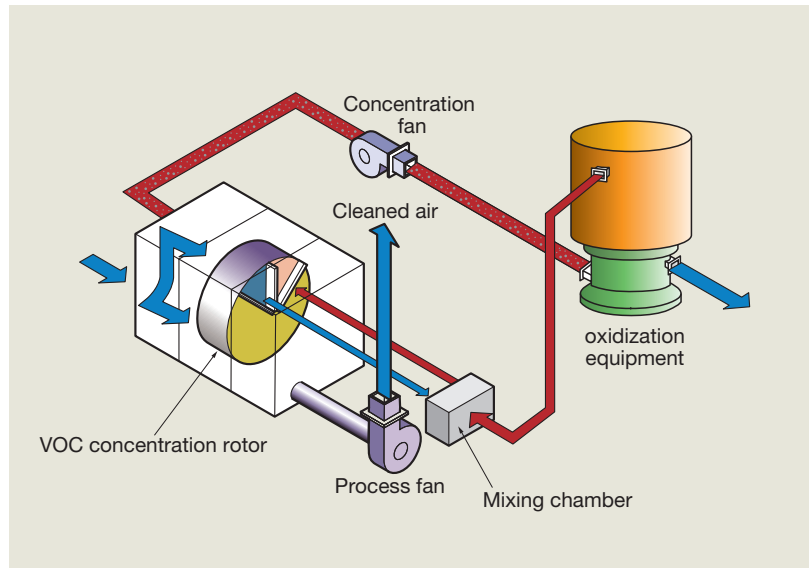
After low concentration, high flow amount air containing VOC is converted to high concentration, low flow amount air by the concentrator, it is oxidization decomposed in a oxidization equipment.

Features

1. The oxidization equipment is small due to the concentration process, reducing overall cost and space.
2. The amount of fuel consumption of the oxidization equipment can be reduced due to the concentration process (the desorption heat source of the concentrator uses the oxidization exhaust gas).

Application

- Paint Booth
- Print line local ventilation
- Coating zone ventilation



Concentrator with cooling recovery system

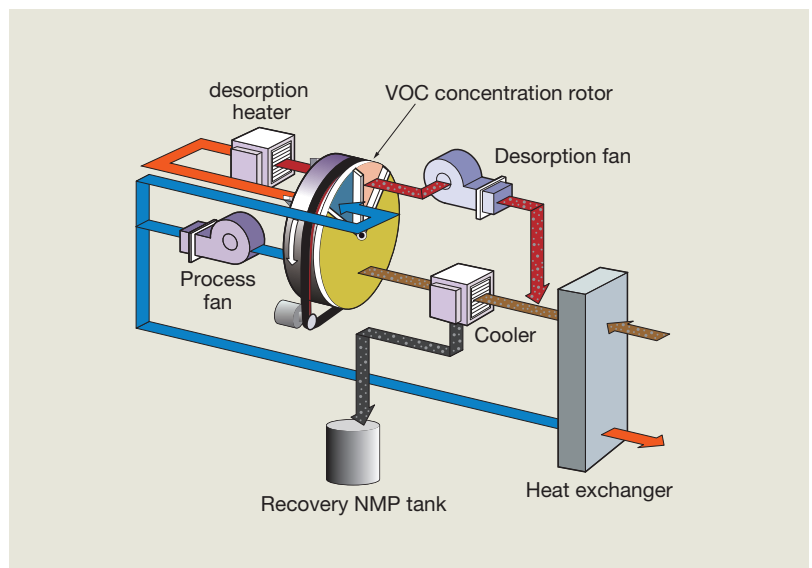
After low concentration, high flow amount air containing VOC is converted to high concentration, low flow amount air by the concentrator, it is recovery processed by a cooling recovery equipment.

Features

1. It can be operated at a cooling temperature close to room temperature.
2. It can be operated when the processing air is in low concentrations.
3. The combination of concentration and cooling makes purification of 90% and higher possible by concentration recycling (using cooling recovery alone, the exhaust concentration is several hundreds of ppm).

Application

- Lithium ion battery production



Concentrator with adsorption recovery system

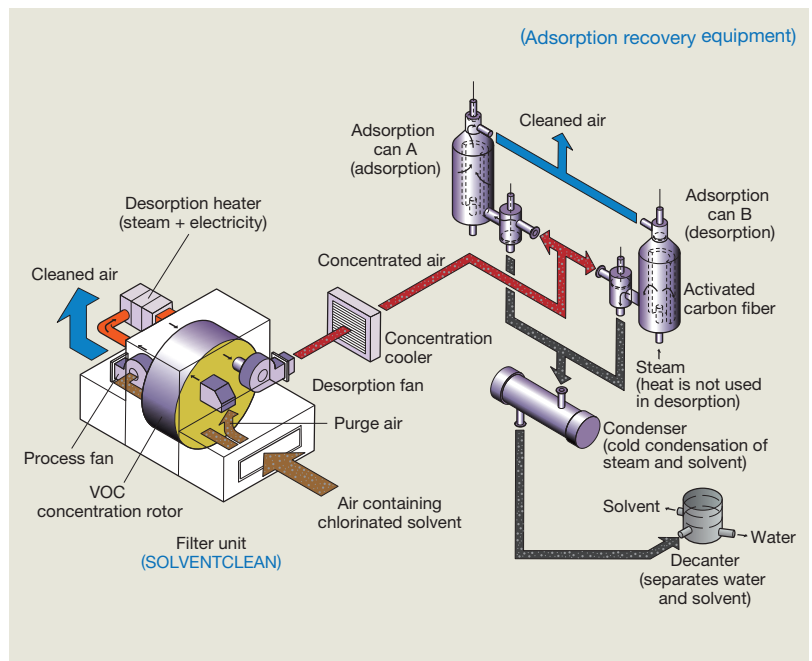
After low concentration, high flow amount air containing VOC is converted to high concentration, low flow amount air by the concentrator, it is recovery processed by an adsorption recovery equipment.

Features

1. The adsorption recovery equipment is small due to the concentration process, reducing overall cost and space.
2. The efficiency of the adsorption recovery equipment is increased due to the concentration process, enabling improvement in VOC recovery efficiency and reduced overall energy consumption.

Applied solvents

- Processing of exhaust gases containing chlorinated solvents (methylene chloride etc.)
e.g. processing of cleaning process exhaust gas
- Adsorption recovery device backup (addition of concentrator)
e.g. post-adsorption exhaust gas cleaning process



Specifications

Concentrator with oxidization system (concentration rotor, air seal, operating section, plenum chamber, and duct entrance)

Type (SCB-)	Process air flow amount (Nm ³ /min) ⁽¹⁾	Dimensions (mm) ⁽²⁾ Length × width × height (L × W × H)	Estimated weight (tons) ⁽²⁾
1220	~200	2100 × 1550 × 1650	1.2
1525	180~300	2100 × 1850 × 1950	1.5
1740	250~400	2100 × 2050 × 2150	1.6
1940	350~500	2100 × 2250 × 2350	1.7
2190	450~600	2100 × 2500 × 2600	2.6
2450	550~750	2100 × 2800 × 2925	3.0
2650	650~900	2100 × 3000 × 3125	3.5
2950	850~1100	2100 × 3300 × 3525	4.0
3250	1000~1300	2100 × 3600 × 3850	4.6
3550	1200~1600	2100 × 3900 × 4150	5.2
3850	1400~1900	2100 × 4200 × 4450	5.8
4200	1700~2300	2100 × 4550 × 4800	7.0
4500	2000~2500	2100 × 4850 × 5100	8.2



Note(1) : The process air flow amount and concentrated air flow amount vary depending on the usage conditions.

Note(2) : Dimensions and weight may be changed without notice.

Solvent concentration cassette (concentration rotor, air seal, and operating section)

Type (SCC-)	Process air flow amount (Nm ³ /min) ⁽¹⁾	Dimensions (mm) ⁽²⁾ Length × width × height (L × W × H)	Estimated weight (tons) ⁽²⁾
1220	~200	840 × 1550 × 1650	0.8
1525	180~300	840 × 1850 × 1950	1.0
1740	250~400	840 × 2050 × 2150	1.2
1940	350~500	840 × 2250 × 2350	1.3
2190	450~600	840 × 2500 × 2600	2.0
2450	550~750	840 × 2800 × 2925	2.4
2650	650~900	840 × 3000 × 3125	2.8
2950	850~1100	840 × 3300 × 3525	3.3
3250	1000~1300	840 × 3600 × 3850	3.6
3550	1200~1600	840 × 3900 × 4150	4.3
3850	1400~1900	840 × 4200 × 4450	5.1
4200	1700~2300	840 × 4550 × 4800	5.7
4500	2000~2500	840 × 4850 × 5100	6.2



Note(1) : The process air flow amount and concentrated air flow amount vary depending on the usage conditions.

Note(2) : Dimensions and weight may be changed without notice.

SOLVENTCLEAN™ Inquiry Sheet

When determining the specifications of SOLVENTCLEAN, we require the items described in the Inquiry Sheet.

Please supply as much information as possible.

Company name			
Department name		Name	
Phone	() —	Fax	() —
Delivery destination company			
Delivery destination area	(e.g. Chiba, Japan; Shanghai, China, etc.)		
Purpose of concentration	(e.g. automotive paint exhaust gas, FPD production exhaust gas, etc.)		
Installation location	① <input type="checkbox"/> Interior, <input type="checkbox"/> Exterior / ② <input type="checkbox"/> Ground level, <input type="checkbox"/> Rooftop		
Utilities	V × Hz		

● Upstream side of SOLVENTCLEAN (factory exhaust gas)

[Amount of air flow] _____ Nm³/min, Nm³/hr

[Temperature] _____ °CDB

[Humidity] _____ %RH, g/kg'

[Contaminants] (particles) _____ mg/Nm³, (mist) _____ mg/Nm³

[VOC ingredients contained in exhaust gas] _____ units: v-ppm, mg/Nm³

Solvent name	Concentration	Solvent name	Concentration
(e.g.) Acetone	(e.g.) 100		

● Downstream side of SOLVENTCLEAN ① (cleaned air)

[Concentration contained after cleaning] _____ v-ppm or less, mg/Nm³ or less

or [Cleaning efficiency] _____ % or more

● Downstream side of SOLVENTCLEAN ② (concentrated air)

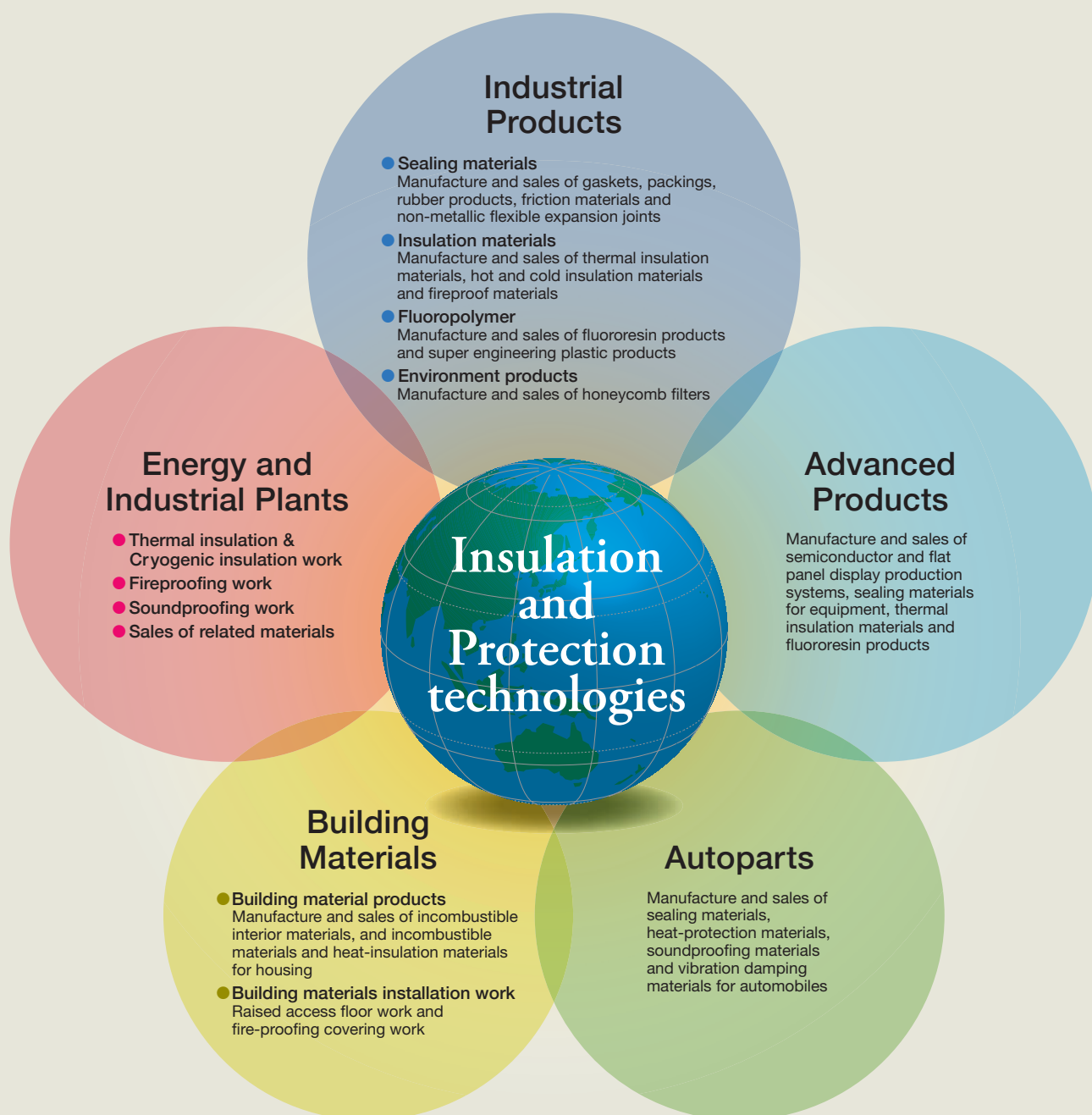
[Concentration rate] _____ times



NICHIAS contributes to the Earth's bright future through our Insulation and Protection technologies

The Nichias Group, founded in 1896 as a pioneer in the field of thermal insulation, has expanded its range of activities, starting with electricity and gas, from such key industries as petroleum production and petrochemicals, chemicals, shipbuilding, steel, automobiles, construction, etc. to industrial fields such as electronics, environment-related businesses, etc.

We will continue to contribute to the Earth's bright future with our "insulation and protection" technology.



Company overview (as of March 31, 2023)

Company Name : NICHIAS Corporation
 Establishment : April 9, 1896
 Head Office : 1-6-1, Hatchobori, Chuo-ku, Tokyo
 Capital : 12,128,352,879 yen
 Number of associated employees : 6,445

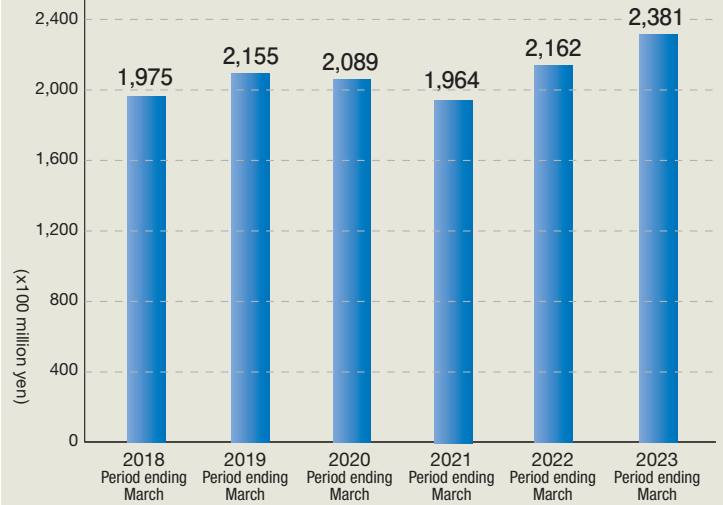
● Domestic factories

Tsurumi Factory Yokohama, Kanagawa Prefecture
 Ohji Factory Kitakatsuragi, Nara Prefecture
 Hashima Factory Hashima, Gifu Prefecture
 Fukuroi Factory Fukuroi, Shizuoka Prefecture
 Yuki Factory Shimotsuma, Ibaraki Prefecture

● Laboratories

Tsurumi Research Laboratory Yokohama, Kanagawa Prefecture
 Hamamatsu Research Laboratory Hamamatsu, Shizuoka Prefecture

Consolidated sales



Network

● Main domestic group companies

Sales & Construction Companies

NICHIAS CERATECH CO., LTD.
 Manufacture and Sales of insulation materials and building materials

TOKYO MATERIALS CORPORATION
 Sale of sealing materials and fluoropolymer products

NICHIAS KANTO SALES CORPORATION
 Sale of sealing materials, insulation materials and fluoropolymer products

NISHI-NIPPON NICHIAS CORPORATION
 (formerly AKITSU INDUSTRY CORPORATION)
 Manufacture and sale of sealing materials, insulation materials and fluoropolymer products

HAMAASU CORPORATION
 Sale of sealing materials, insulation materials, fluoropolymer products and building materials, industrial thermal insulation work and installation work of building materials

NIPPON THERMAL ENGINEERING CORPORATION
 Industrial thermal insulation work

NICHIAS ENGINEERING SERVICE CORPORATION
 Industrial thermal insulation work

INOCRETE CO., LTD.
 Industrial thermal insulation work

NICHIAS KYUSHU SALES CO., LTD.
 Sale of sealing materials, insulation materials and fluoropolymer products

NIPPON ROCKWOOL CORPORATION
 Sales of building materials

NICHIAS CEMCRETE CORPORATION
 Sales and installation work of building materials

Factories

NICHIAS CERATECH CO., LTD.
 Manufacture and Sales of insulation materials and building materials

SAKAI NICHIAS CORPORATION
 Manufacture of insulation materials

KOKUBU INDUSTRY CORPORATION
 Manufacture of sealing materials, insulation materials, filters and auto parts

TATSUTA INDUSTRY CORPORATION
 Manufacture of sealing materials, insulation materials, auto parts and building materials

OHTA KASEI CORPORATION
 Manufacture of insulation materials

NICHIAS MECHATECHNO CO., LTD.
 Manufacture of sealing materials and fluoropolymer products

NISHI-NIPPON NICHIAS CORPORATION
 (formerly AKITSU INDUSTRY CORPORATION)
 Manufacture and sale of sealing materials, insulation materials and fluoropolymer products

FUKUSHIMA NICHIAS CORPORATION
 Manufacture of insulation materials, fluoropolymer products and auto parts

KUMAMOTO NICHIAS CORPORATION
 Manufacture of fluoropolymer products

METAKOTE INDUSTRY CORPORATION
 Manufacture of auto parts

APJ CORPORATION
 Manufacture of auto parts

N&A TECH CO., LTD.
 Manufacture of auto parts

KIMITSU ROCKWOOL CORPORATION
 Manufacture of building material

● Main overseas group companies

Sales & Construction Companies

▶ **Indonesia**
PT. NICHIAS SUNIJAYA
 Sales of sealing materials, insulation materials, fluoropolymer products, auto parts, building materials, and Industrial thermal insulation work

▶ **Malaysia**
NICHIAS SOUTHEAST ASIA SDN. BHD.
 Sales of sealing materials, insulation materials, fluoropolymer products, auto parts and Engineering and insulation work

▶ **Singapore**
NICHIAS SINGAPORE PTE LTD.
 Sales of sealing materials, insulation materials, Filters, fluoropolymer products, auto parts, and building materials

▶ **Vietnam**
NICHIAS VIETNAM CO., LTD.
 Sales of sealing materials, insulation materials, fluoropolymer products, and auto parts

▶ **Thailand**
NICHIAS (THAILAND) CO., LTD.
 Manufacture and sales of auto parts

THAI NICHIAS INTERNATIONAL CO., LTD.
 Sales of sealing materials, insulation materials, fluoropolymer products and building materials

▶ **China**
NICHIAS (SHANGHAI) TRADING CO., LTD.
 Sales of sealing materials, insulation materials, filters and fluoropolymer products

NICHIAS (SHANGHAI) TRADING CO., LTD. GUANGZHOU BRANCH
 Sales of sealing materials, insulation materials, filters and fluoropolymer products

NICHIAS (SHANGHAI) AUTOPARTS TRADING CO., LTD.
 Sales of auto parts

SHANGHAI XINGSHENG GASKET CO., LTD.
 Manufacture and sales of auto parts

SUZHOU SHUANGYOU AUTOPARTS CO.,LTD.
 Manufacture and sales of auto parts

▶ **India**
NICHIAS INDUSTRIAL PRODUCTS PRIVATE LTD.
 Manufacture and Sales of sealing materials, insulation materials and auto parts

▶ **Czech Republic**
NICHIAS AUTOPARTS EUROPE a.s.
 Manufacture and sales of auto parts

▶ **Mexico**
NAX MFG, S.A.DE C.V.
 Manufacture and sales of auto parts

Factories

▶ **Indonesia**
PT. NICHIAS ROCKWOOL INDONESIA
 Manufacture of sealing materials, insulation, and auto parts

PT. NICHIAS METALWORKS INDONESIA
 Manufacture of sealing materials and building materials

▶ **Malaysia**
NICHIAS FGS SDN. BHD.
 Manufacture of sealing materials, fluoropolymer products, auto parts and building materials

NT RUBBER-SEALS SDN. BHD.
 Manufacture of sealing materials

▶ **Vietnam**
NICHIAS HAIPHONG CO., LTD.
 Manufacture of sealing materials, filters, and fluoropolymer products

▶ **Thailand**
NICHIAS (THAILAND) CO., LTD.
 Manufacture and sales of auto parts

THAI-NICHIAS ENGINEERING CO., LTD.
 Sales of insulation materials, and Engineering and insulation work

▶ **China**
SUZHOU NICHIAS INDUSTRIAL PRODUCTS CO., LTD.
 Manufacture of sealing materials, fluoropolymer products and auto parts

SUZHOU NICHIAS SEAL MATERIAL CO., LTD.
 Manufacture of sealing materials, insulation materials and filters

SHANGHAI XINGSHENG GASKET CO., LTD.
 Manufacture and sales of auto parts

SUZHOU SHUANGYOU AUTOPARTS CO.,LTD.
 Manufacture and sales of auto parts

▶ **India**
NICHIAS INDUSTRIAL PRODUCTS PRIVATE LTD.
 Manufacture and Sales of sealing materials, insulation materials and auto parts

▶ **Czech Republic**
NICHIAS AUTOPARTS EUROPE a.s.
 Manufacture and sales of auto parts

▶ **Mexico**
NAX MFG, S.A.DE C.V.
 Manufacture and sales of auto parts



Head Office

6-1, Hatchobori 1-chome, Chuo-ku, Tokyo 104-8555, Japan
International Marketing and Sales Group
 Phone: 81-3-4413-1132 Fax: 81-3-3552-6108
 Web Site: <https://www.nichias.co.jp/>

Overseas Sales Companies

Indonesia

PT. NICHIAS SUNIJAYA

Sequis Tower Level 19 Suite 1&2,
 Jl. Jend Sudirman Kav. 71, Jakarta 12190, Indonesia
 Phone: +62-21- 2277-6101 Fax: +62-21- 2793-8033

Malaysia

NICHIAS SOUTHEAST ASIA SDN. BHD.

Suite A1102, 11th Floor, West Wing, Wisma Consplant 2,
 No. 7, Jalan SS 16/1, 47500 Subang Jaya, Selangor Darul Ehsan, Malaysia.
 Phone: +60-3-5636-4067 Fax: +60-3-5636-4078

Singapore

NICHIAS SINGAPORE PTE. LTD.

25 International Business Park, #01-15/17 German Centre,
 Singapore 609916
 Phone: +65-6571-0830/0838 Fax: +65-6265-7681

Vietnam

NICHIAS VIETNAM CO., LTD

Room 709, Elite Business Center, 7th Floor Diamond Flower Building,
 48 Le Van Luong Street, Nhan Chinh Ward, Thanh Xuan District,
 Hanoi, Vietnam
 Phone: + 84-24-6664-3136 Fax: + 84-24-6666-8168

Thailand

NICHIAS (THAILAND) CO., LTD.

85 Moo 1, Wellgrow Industrial Estate T. Homsin, A. Bangpakong
 Chachoengsao 24180, Thailand
 Phone: +66-38-570-600 Fax: +66-38-570-601

THAI NICHIAS INTERNATIONAL CO., LTD.

Unit 1107, 11th Floor, AIA Capital Center
 89 Ratchadaphisek Road, Dindaeng, Dindaeng, Bangkok 10400 Thailand
 Phone: +66-2-001-2060 Fax: +66-2-001-2062

China

NICHIAS (SHANGHAI) TRADING CO., LTD.

霓佳斯（上海）贸易有限公司
 Room 1701, THE PLACE, Tower A, No. 100 Zun Yi Road,
 Changning District, Shanghai, P.R.China Postcode 200051
 中国上海市长宁区遵义路100号虹桥南丰城A栋1701室 邮编200051
 Phone: +86-21-6236-1783 Fax: +86-21-6236-1781

NICHIAS (SHANGHAI) TRADING CO., LTD. Guangzhou Branch

霓佳斯（上海）贸易有限公司 广州分公司
 17F-G, Gold Sun Building, No.109 Tiyu West Road, Guangzhou,
 Guang Dong Province, 510620, P.R.China
 中国广东省广州市天河区体育西路109号高盛大厦17楼G室 邮编 510620
 Phone: +86-20-3879-1640 Fax: +86-20-3879-1647

NICHIAS (SHANGHAI) AUTOPARTS TRADING CO., LTD.

霓佳斯（上海）汽车零部件贸易有限公司
 Room 1702, THE PLACE, Tower A, No. 100 Zun Yi Road,
 Changning District, Shanghai, P.R.China Postcode 200051
 中国上海市长宁区遵义路100号虹桥南丰城A栋1702室 邮编200051
 Phone: +86-21-6236-2668 Fax: +86-21-6236-2667

Overseas Construction Companies

Malaysia

NICHIAS SOUTHEAST ASIA SDN. BHD.

Suite A1102, 11th Floor, West Wing, Wisma Consplant 2,
 No. 7, Jalan SS 16/1, 47500 Subang Jaya, Selangor Darul Ehsan, Malaysia.
 Phone: +60-3-5636-4067 Fax: +60-3-5636-4078

Thailand

THAI-NICHIAS ENGINEERING CO., LTD.

45 Huaypong-Nongbon Road, Huaypong, Muang Rayong,
 Rayong Province 21150, Thailand
 Phone: +66-38-682-242 Fax: +66-38-691-156

Overseas Factories

Indonesia

PT. NICHIAS ROCKWOOL INDONESIA

PT. NICHIAS METALWORKS INDONESIA

Malaysia

NICHIAS FGS SDN. BHD.

NT RUBBER-SEALS SDN. BHD.

Vietnam

NICHIAS HAIPHONG CO., LTD.

China

SUZHOU NICHIAS INDUSTRIAL PRODUCTS CO., LTD.

(苏州霓佳斯工业制品有限公司)

SUZHOU NICHIAS SEAL MATERIAL CO., LTD.

(苏州霓佳斯密封材料有限公司)

SHANGHAI XINGSHENG GASKET CO., LTD.

(上海兴盛密封垫有限公司)

SUZHOU SHUANGYOU AUTOPARTS CO., LTD.

(苏州双友汽车零部件有限公司)

India

NICHIAS INDUSTRIAL PRODUCTS PRIVATE LTD.

Czech

NICHIAS AUTOPARTS EUROPE a.s.

Mexico

NAX MFG, S.A.DE C.V.

⚠ Cautions

- The products included in this catalog are intended for common use, including those presented in the catalog. If you intend to use any of the products in a way that requires extremely high quality and reliability such that any possible defect may directly affect the safety of human lives, please make sure to consult with our company in advance and take necessary measures at your responsibility.
- Because the stated material values may vary according to actual usage environments or circumstances, please consider such figures as indications for reference.
- The content of the catalog explains the features of the products when they are used alone. When actually using the products, please start using them after testing them under the actual usage environment.
- The content of the explanation of the products may be modified without any advance notice, and the production of the product may also be discontinued without advance notice. Please obtain the latest version of the catalog, and confirm the content thereof. The date of issuance of this catalog is printed on this page.
- The standards, accreditation and provisions of laws included in the catalog may not conform with the latest version thereof.
- We strictly prohibit any acts of infringement upon our rights that are protected by the Copyright Act with regard to information included in the catalog, through the production of copies or imitations, misappropriation or unauthorized reprinting.
- Please be informed that, in the case where any problem involving a third party's industrial property right arises due to the use of any product included in the catalog, our company shall not be responsible for any problems other than the problems arising strictly due to reasons related to only such products.
- Please be aware that our company will not bear any responsibility for the following damage related to our products:
 - Damage arising due to natural disasters or accidents occurring for reasons that are not attributable to our company;
 - Damage arising due to remodeling, repairing or other acts by a third party;
 - Damage arising due to the willful intent or negligence of the customer or the user, or due to the improper use or use under abnormal conditions of the products;
 - Damage arising due to the failure to carry out regular checkups and appropriate repairs, maintenance and part replacements, considering various conditions, such as the usage conditions, usage environment and usage period, etc., of the product;
 - Indirect damage (including any operational damage, lost profits, opportunity losses, etc.) arising due to the use of or inability to use our company's product;
 - Damage arising due to a situation which was unforeseeable under the technical standards at the time of the shipment of our company's product; or
 - Damage arising due to reasons that are not attributable to our company.