

Voluntary Management of VOC Emission Control at Monodzukuri Cleaning Process

= Application of EVABAT in VOC Risk Management =

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1

Voluntary Management of VOC Emission Control at Monodzukuri Cleaning Process

1. Forward

2. Products manufacturing (Monodzukuri) and cleaning technology
3. Management of chemical substances
4. Policies for environmental management
5. Implementation of voluntary management in VOC emission control
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7. Introduction of the trial version and its future prospect

2

JICC = New Japanese Organization of Cleaning Technology for Ozone Layer Protection

- 1990.7: Birth of JICOP (Japan Industrial Conference for Ozone Layer Protection)
- 1992.9: Plan to establish a new organization for ODS phase-out in cleaning field
- 1994.4: Birth of new organization for cleaning technology
 - JICC (Japan Industrial Conference on Cleaning)
 - Cross-industrial net work (Producers of Cleaning agent, machine, auxiliary part, user company, think tank, trading firm)
- Especially with Environmental consciousness

3

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1. Forward

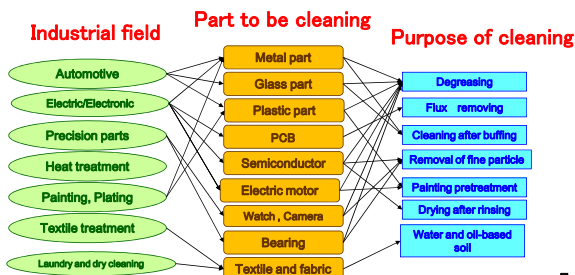
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4

Application fields and purpose of cleaning

Industrial cleaning is a process to treat each parts, assembled parts and final products in order to remove soil and dirt by physical and chemical power, and to obtain desired cleanliness.



5

Core Manufacturing Technologies in Monodzukuri Site

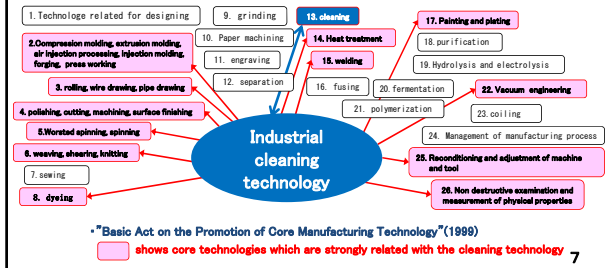
- Basic Act on the Promotion of Core Manufacturing Technology (1999.3)
- Core Manufacturing Technology

The term "core manufacturing technology" as used in this Act means such technology pertaining to the design, manufacture or repair of industrial products that is specified by a cabinet Order as versatile technology that supports the development of the manufacturing industry.

6

Position of "Cleaning technology" in "Core manufacturing technologies"

Cleaning technology is utilized widely in many process to treat, to assemble and to finish various materials such as metal and plastic. It is an essential technology to support other core manufacturing technologies in the background.



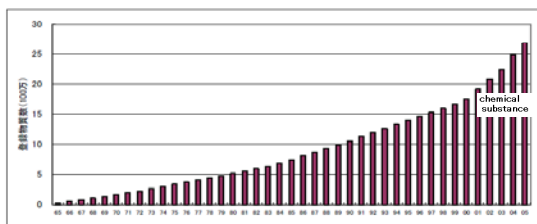
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Increase of Chemical Substances

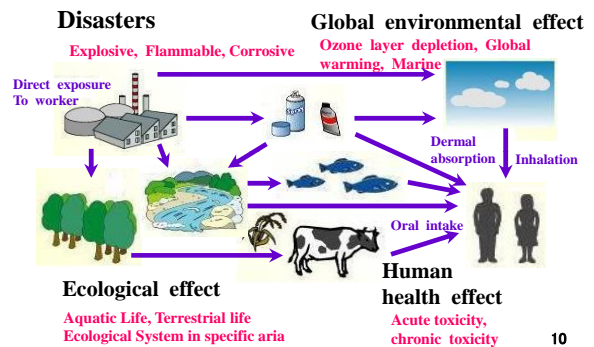
Numbers of chemical substance	Year	Count
	1985	< 1,000,000
	1980	> 5,000,000
	1990	> 10,000,000
	2008.8.13	≈ 50,000,000
	2011.9	?

図表 1-2 : CAS (Chemical Abstracts Service) Chemical Registry 登録物質数の推移 (塩基配列データを除く) (1965-2005)

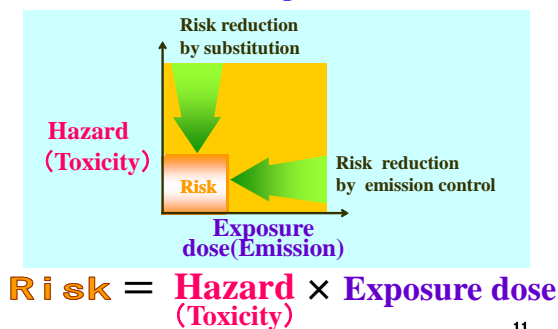


出所 : CAS, Statistical Summary より作成。

Hazard of Chemical Substances



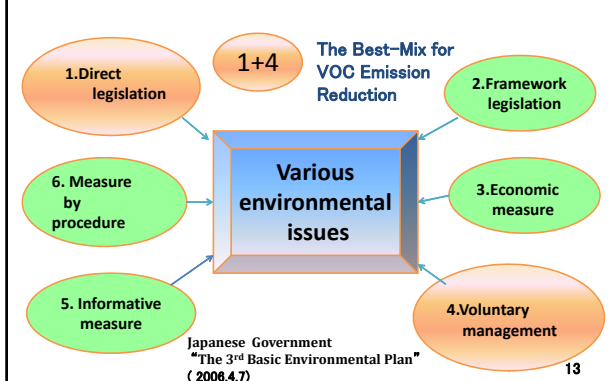
From Hazard Management to Risk Management



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Techniques of Environmental Policies (1)



Techniques of Environmental Policies (2)

1. Method by Direct Legislation

- To make clear by law and regulation about certain goals, that must be achieved by the whole society and the minimum level of compliance that should be followed.

2. Method by Framework Legislation

- To try to achieve goals according to objective, order and requirement.
- Not to forbid or restrain the specific practices directly

3. Method by Economic Approach

- Taxes and subsidies to activate market mechanism

14

Techniques of Environmental Policies (3)

4. Method by Voluntary Management

- For manager, certain goals shall be set for their behaviors in implementation of voluntary environmental protection measures.

5. Method by Information Approach

- They do not directly forbid or restrain the specific practices, but, try to achieve goals according to objectives, orders and requirements through their obligations.

6. Method through Procedure

- Technique of a measure to accelerate their own environmental activities through establishing a standard of environmental judgment.

15

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16

Amendment of the Law to Prevent Air Pollution

- 2003 Investigation to amend the law
 - Law : Air Pollution Control Law
 - Meeting : Atmospheric Environment Conference (Central Environment Council in Ministry of Environment)
- 2004 The interim report by the conference to the Council.
- 2005 Promulgation of the amended law
- 2006 Enforcement of the amended law
 - Target of voluntary management
 - From 2010 : 30% Reduction of 2000 value
 - The "Best-Mix"(Combination of law legislation and voluntary management of enterprises)

17

Industrial organizations which declared to do voluntary management as a group (1)

- Japan Gas Association (JGA)
- Japan Textile Finishers Association (JTFA)
- Japan Paper Association (JPA)
- Japan Iron and Steel Federation (JISF)
- Four groups of electrical and electronic organizations
 - Japan Electronics and Information Technology Industries Association (JEITA)
 - Communications and Information Network Association of Japan (CIAJ)
 - Japan Business Machine and Information System Industries Association (JBMIA)
 - Japan Electrical Manufacturers Association (JEMA)
- Japan Paint Manufacturers Association (JPM)
- Japan Auto Parts Industries Association (JAPIA)
- Japan Automobile Manufacturers Association, Inc. (JAMA)
- Japan Wire Products Association (JPMA)
- Japan Copper and Brass Association (JCBA)

18

Industrial organizations which declared to do voluntary management as a group (2)

- Federation of Electro Plating Industry Association (FEPIA)
- Japanese Electric Wire & Cable Makers' Association (JCMA)
- Japanese fused Zinc Plating Association (JFZP)
- Japan Aluminum Association (JAA)
- Japan Construction Material & Housing Equipment Industries Federation (J-CHIF)
- Japan Natural Gas Association (JNGA)
- Petroleum Association of Japan (PAJ)
- Japan Federation of Printing Industries (JFPI)
- Japan Chemical Industry Association (JCIA)
- Japan Steel Drum Association (JSDA)
- Aluminum Products Association (APA)
- Japan Plastics Industry Federation (JPIF)
- Japan Office Institutional Furniture Association (JPIFA)
- Japan Plating Suppliers Association (JPISA)

19

Industrial organizations which declared to do voluntary management as a group (3)

- Japan Auto-Body Industries Association Inc. (JABIA)
- Japan Adhesive Industry Association (JAIA)
- Japanese Dyeing Trade Union Federation
- Prefabricated Building Association
- Japan Printing Ink Makers Association (JPIMA)
- Industrial Painting Cooperative Federation of Japan
- Japan Rubber Manufacturers Association (JRMA)
- Japan Auto-Body Repair Association (JABRA)
- Japan Adhesive Tape Manufacturers Association (JATMA)
- All-Japan Musical Instruments Association
- Japan Fishing Tackle Manufacturers Association (JFTMA)
- Japan Association of Metal Household Items
- Japan Western Tableware Industry Association
- BS President Business Cooperative Association
- Japan Industrial Association of Gas and Kerosene Appliances (JGKA)

20

Supporting Organizations for VOC Voluntary Management

Trans-industrial voluntary management has been dealt by two organizations as follows; These organizations are not the group of enterprises who emit VOC, but have experience to advise how to control VOC emission.

(1) Japan Environmental Management Association for Industry (JEMAI)

- Supporting board for VOC voluntary management
- Editing of manual and handbook for VOC emission control

(2) Japan Industrial Conference on Cleaning (JICC)

- Editing of manual and handbook for VOC emission control
- Field guidance to cleaning site of SME
- Development of EVABAT system

21

JEMAI : Supporting Board for VOC Voluntary Management



22

JICC : Manuals of VOC Emission Control for Voluntary Management

Editing : Ministry of the Environment
JICC (Japan Industrial Conference on Cleaning)
Asahi Research Center Co., Ltd.



Manual to Support Voluntary Management For VOC Emission at Cleaning process 23



Examples of actual VOC emission control for cleaning processes at small enterprises 23

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24

EVABAT

Economically Viable Application of Best Available Technology

- 4. Environmental management system requirements,
 - 4.3.3 Objectives, targets and programme(s)
- Annex A (informative) Guidance on the use of this International Standard
 - A.3.3 Objectives, targets and programme(s)
 - When considering its technological options, an organization should consider the use of best-available techniques where economically viable, cost-effective and judged appropriate.”

25

Importance of EVABAT

1. How to choose the most suitable technology
 - “Economically viable”
 - “Best” and “available”
2. Factors for the selection
 - Conditions of management
 - Scale of business
 - Policy of management,
 - Geographical condition
 - Condition of production
 - Restriction from Existing facilities
 - Process schedule of production
 - Characteristics of final product
 - Quality, Originality
3. Tool to promote voluntary management

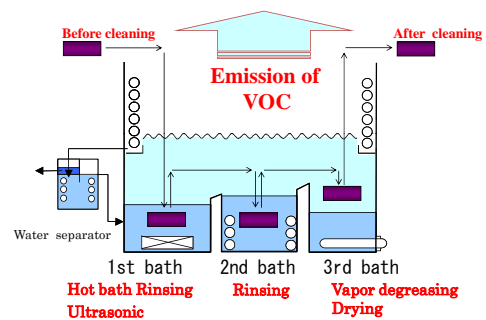
26

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27

Example of Cleaning Process



28

Evaluation of EVABAT (1) Evaluation of cleaning performance

- Harmless to parts to be cleaned
- To achieve expected cleanliness
- Close linkage between previous process and following process can be designed easily

29

Evaluation of EVABAT (2) Evaluation of environmental Effect

- Risk management of the cleaning agent is achievable
- Safety to Human body and eco-system
- Pollution-free to water, air, soil etc
- Consideration about global environment

30

Evaluation of EVABAT (3) Evaluation of profitability

- Price of cleaning agent
- Initial cost for cleaning facilities
- Heating and lighting expenses
- Maintenance fee
- Waste water and sewage treatment fee
- Discarded equipments handling fee

31

Evaluation of EVABAT (4) Evaluation of operation for cleaning

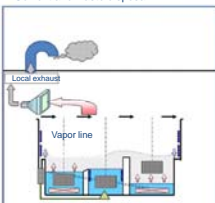
- **Cooling water:** Adjustment of temperature
- **Parts:** Configuration of parts to be cleaned
- **Drying:** Drying after vapor degreasing
- **Wind speed:** Adjustment around cleaning facilities
- **Exhauster :** Design and operation
- **Vapor:** Recovery of solvent vapor
- **Heat source:** Gas or electricity

32

Example of Input Screen

Navigation: Data entry of current process | Generation of alternative | Evaluation of alternative | Interpretation of results

Solvent and waste disposal



No.	Items	Entry field	Default
(1)	Amount of solvent	500 / [month]	
(2)	Purchase frequency of solvent	1	
(3)	Amount of waste fluid	50.5 / [month]	
(4)	Consignment frequency of waste fluid	1	
(7)	Replacing criteria of solvent	Oil Concentration 10 %	10 %
(8)		Specific gravity 1.21	1.21
(9)		Boiling point ℃	150 ℃

Facility conditions | Process conditions | Investment conditions

33

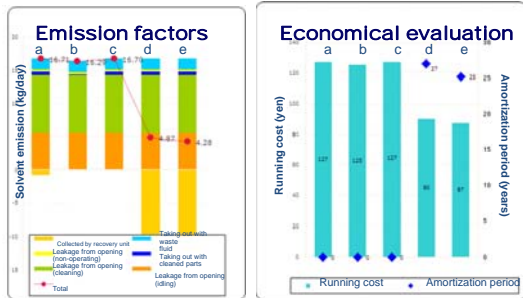
Data of the Conditions of Cleaning

- **Equipment :** Size of cleaning facilities
- **Cleaning agent :** Type and its consumption.
- **Process conditions:** Environmental information during operation
- **Investment conditions:** Purchase price of cleaning agent

34

Example of Output Screen

Selection of the best measures



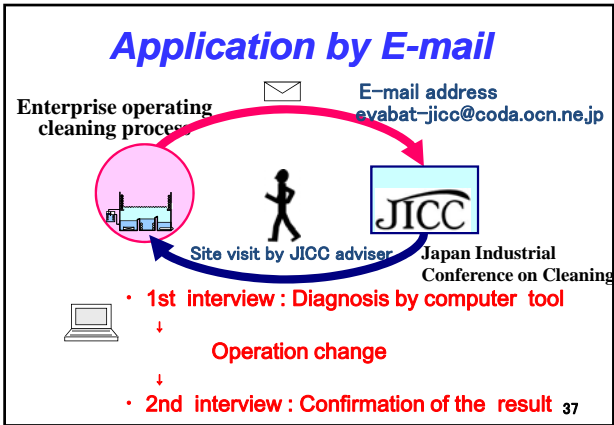
- (a) Current process
(b) Drying after vapor cleaning and placement of cleaning parts
(c) Placement of cleaning parts
(d) Introduction of solvent recovery unit
(e) Introduction of solvent recovery unit and changing the shape of local exhaust ventilation

35

Demonstration of the EVABAT System At "Cleaning Expo 2011"



36



Thank you very much
for your kind attention

고맙습니다

謝 謝

ご静聴有り難うございました

38