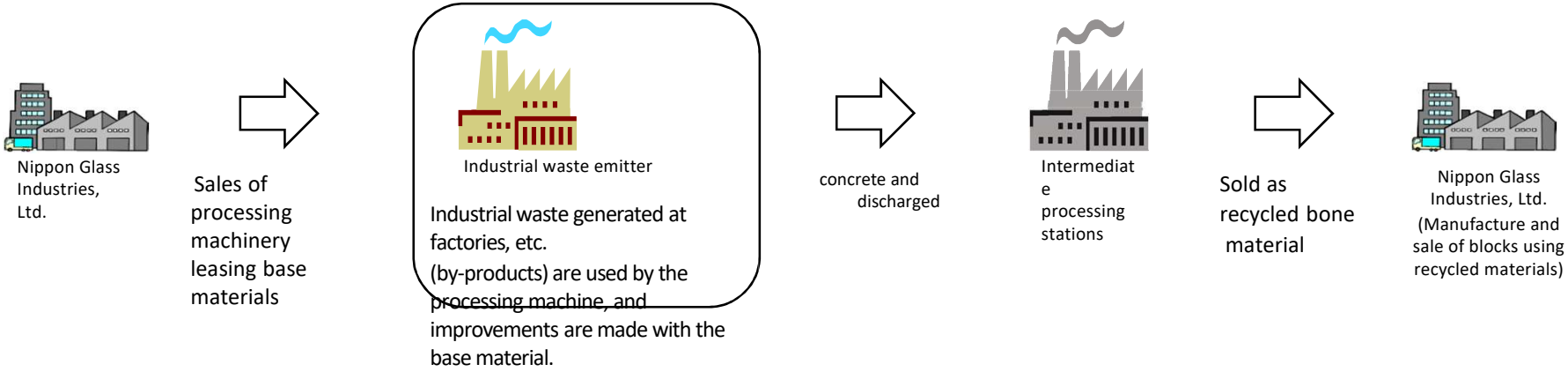
Improvement of contaminated soil and industrial waste

Nippon Glass Industry
Co., Ltd.

Treatment methods for industrial waste, etc.

- In the case of soil improvement

- In the case of specially managed sludge



Examples of soil contamination improvement

In the case of soil improvement

Flow of the property

Site of oil contamination Contaminated land

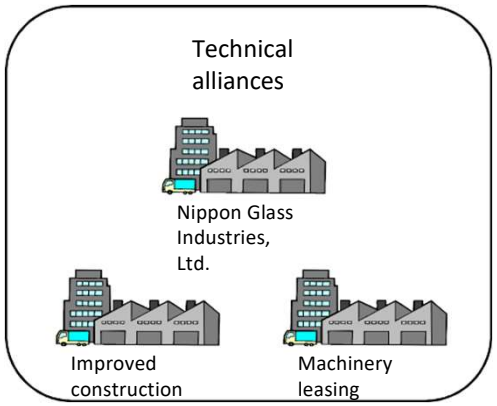
Request for examination of the weighing examination on the premises

Report on survey results Proposal of improvement technology

Flow of orders

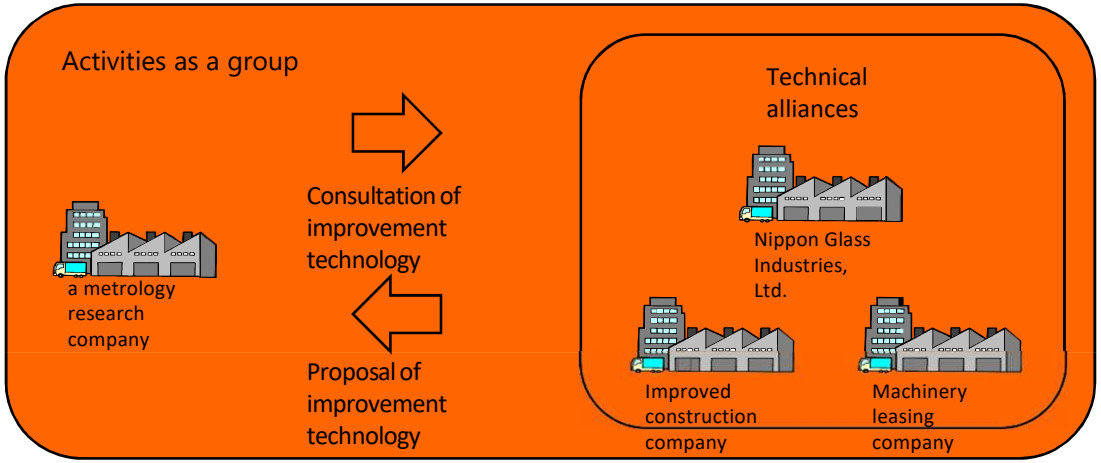
Site of oil contamination Contaminated land

Request for improve ment



Use again

Disposal(remaining soil)



Examples of industrial waste improvement

In the case of industrial waste

Flow of the property

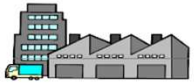
Waste of oil contamination Contaminated waste

Sampling industrial waste

Sampling results Processing technology proposal

Technical alliances

Nippon Glass Industries, Ltd.



Machinery leasing company

・We will conduct improvement experiments on sampled industrial waste in our test room. insoluble so that harmful substances do not flow out.

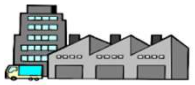
・If insoluble is successful, we will propose technology to waste sources based on cost and technical information.

Flow of orders

Waste of oil contamination Contaminated waste

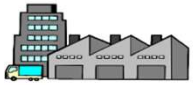
Improvement request (contract)

Technical alliances



Nippon Glass Industries, Ltd. Providing base materials

Intermediate processing stations accepted after improvement



Machinery Leasing Company Processing Machinery Leasing

The gala after the improvement received is sold as recycled bone material.

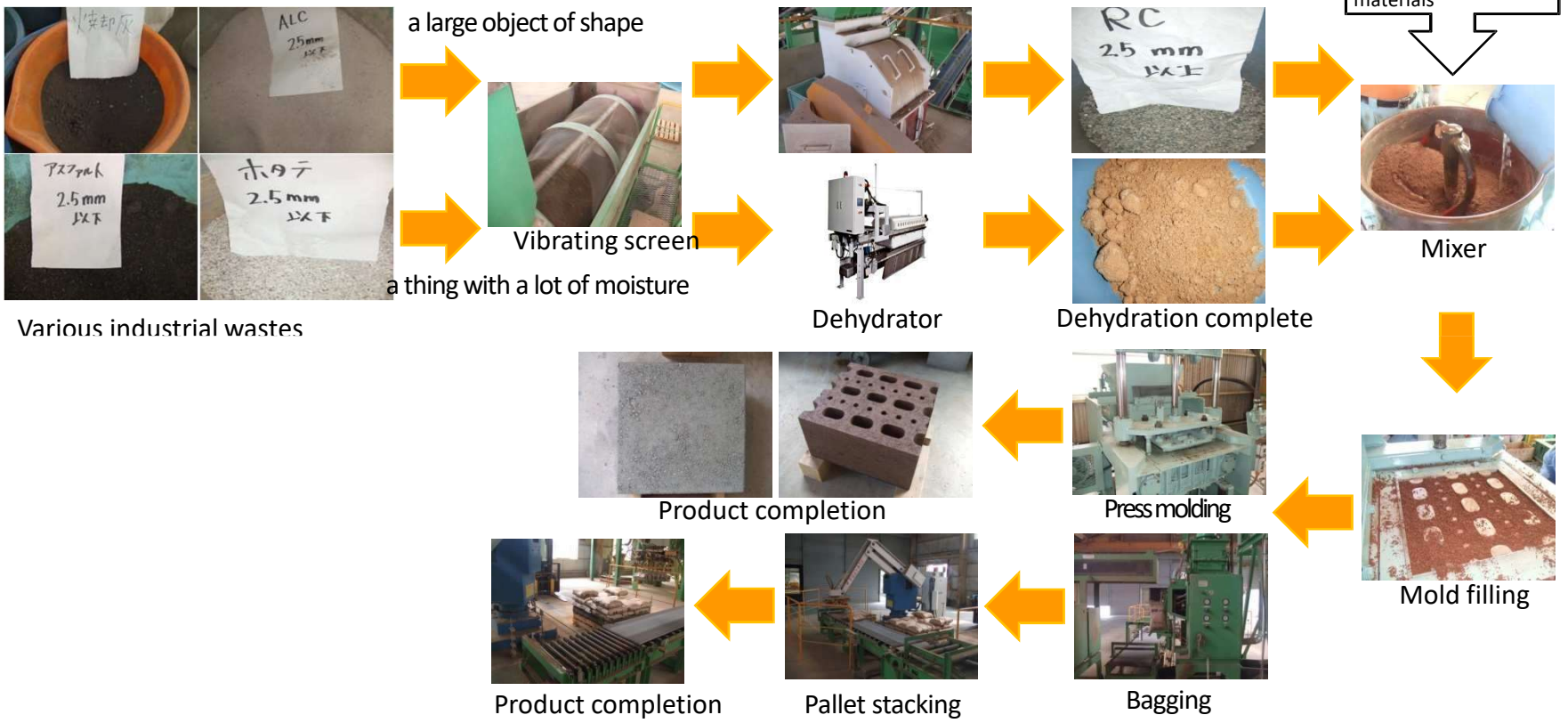
Nippon Glass Industries, Ltd.

We manufacture and sell blocks using recycled materials.

Details of this project (block soil manufacturing)

- Nippon Glass Industry Co., Ltd.

Manufacturing engineering



- Waste detoxification treatment (containment of heavy metals, etc.) at low cost and low energy is possible.
- Various industrial wastes can be used as raw materials for blocks simply by adjusting the particle size.
- No wastewater is issued in the raw materialization process or molding process.
- We can achieve high profit margins in industrial waste disposal income and product sales revenue.
- You can manufacture various block shapes just by changing the mold of the block.
- There is a life-prolonging effect of the final disposal site.
- The performance of existing concrete products remains the same, and the unit price of the product can be sold at about half the price.

Challenges and solutions to conventional technologies

- Problems of conventional technology (sealing soil method)

  ・Until now, the sealing soil method was a technology aimed at improving contaminated soil.

  ・In the managed disposal site, sheets were laid and isolated, natural minerals were mixed and piled up for long-term preservation, crystallized, and imposed harmlessly. Therefore, if the sheet was torn, the unrecrystaled crystal would flow and there was a risk of contamination expansion.

- Novelity of this project

  ・This project uses the principle of the sealing soil method to manufacture and sell “reuse block lump soil”, an environmental block compatible with the next generation that has the strength of concrete blocks without elution of harmful substances such as heavy metals.

  ・The main improvement is to use the base material with some water added to the natural minerals of sio2 system and iron oxide developed by our company.

  ・No wastewater is issued in the raw materialization process or molding process.

  ・Waste detoxification treatment (containment of heavy metals, etc.) at low cost and low energy is possible.

  ・The performance of existing concrete products remains the same, and the unit price of the product can be sold at about half the price.

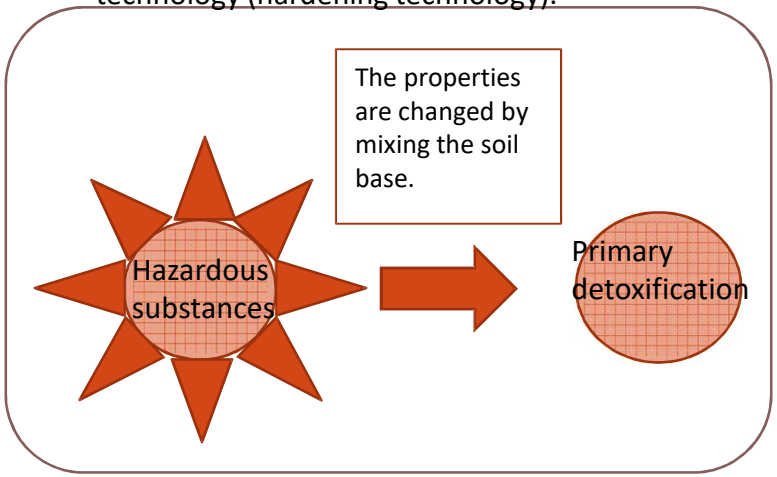
Technology of Nippon Glass Industry Co., Ltd.

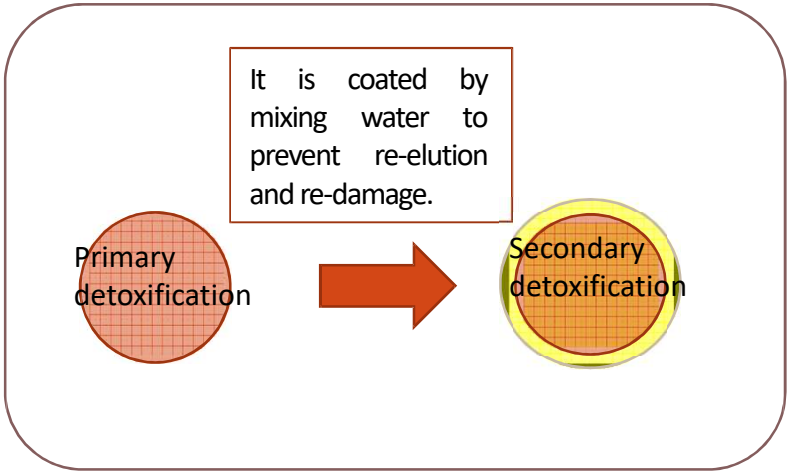
- Technology required for this project
- ①It is possible to detoxification of waste containing heavy metals by mixing soil base with waste containing harmful substances. (A chemical reaction changes a harmful substance into another harmless one.)）
- ②By adding water to the raw materials mixed with waste and soil base during block molding, the quality itself is coated so as not to cause re-elution.

By these two action, it is possible to completely prevent the elution of harmful substances. (See separate sheet for examples.)）

③Based on the raw materials that have been improved, we will block (marketize) various forms with our technology.

The pollution improvement principle of the base material is a geochemical im imrification method from the composition component of the raw material, and is due to the formation of silicate compounds. In addition, the improvement process is completed by coating at the molecular level so as not to react with other substances by our unique coating technology (hardening technology).



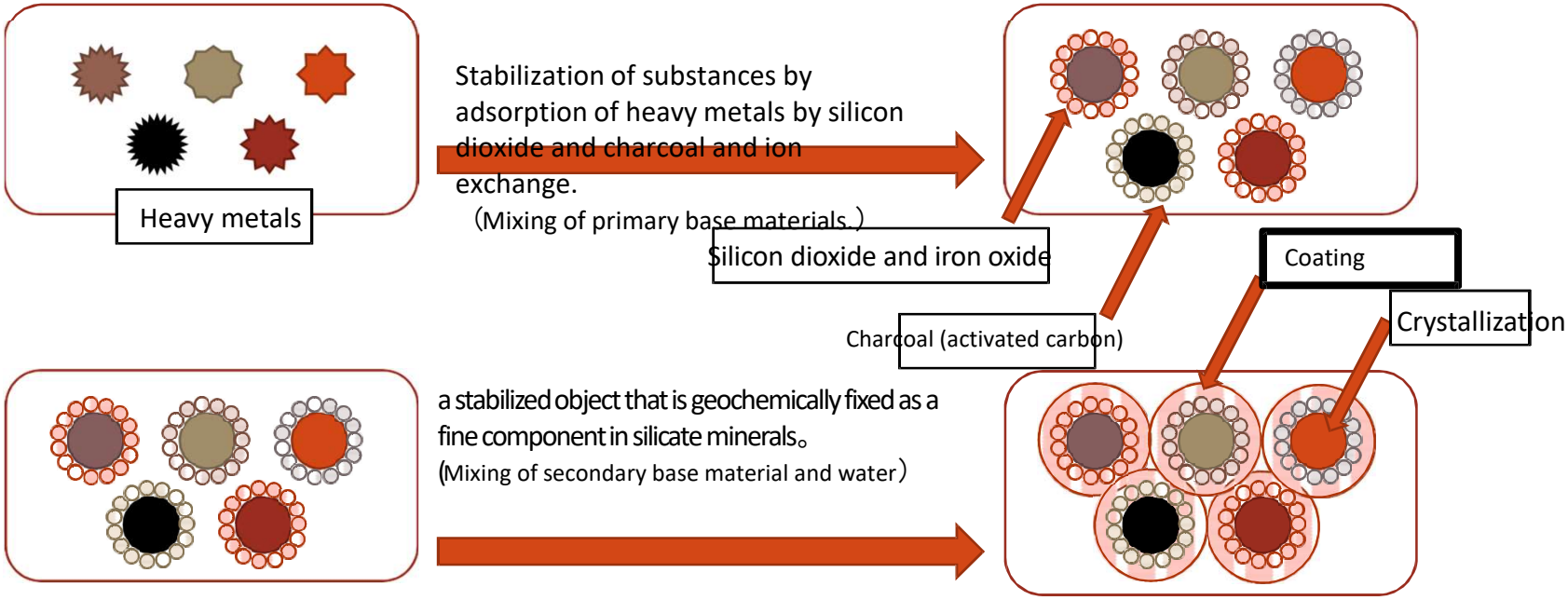


Mechanism of detoxification

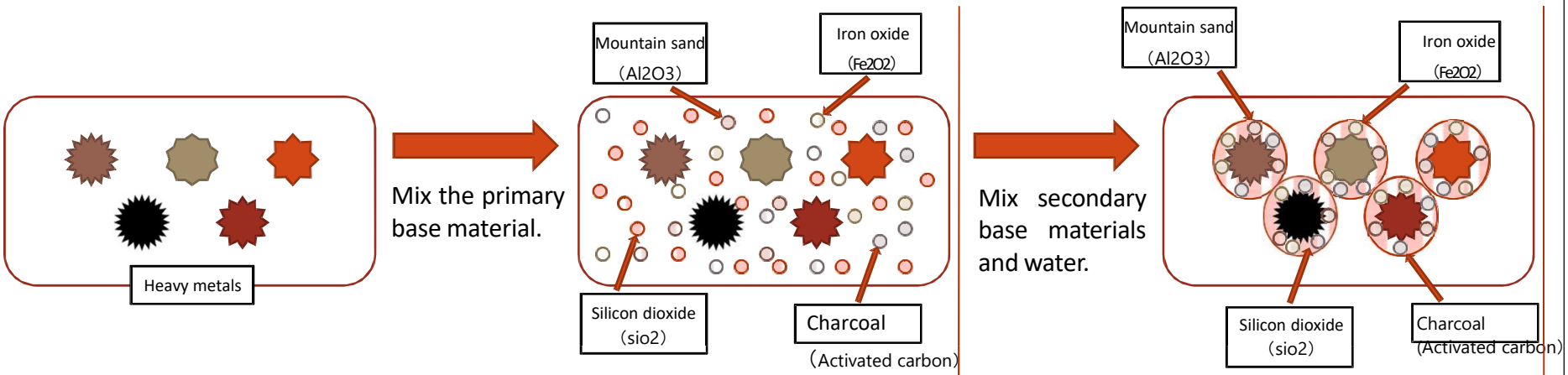
- Technology applying geochemical im im imification method

It is responsible for this effect by adding pigments containing iron oxide to improve the adsorption effect of silicon dioxide (sio2) or carbon (activated carbon), which is a component of the base material, as well as the solid effect by the ion exchange function and the adsorption performance of silicon dioxide.In addition to this short-term im imrification method, there are a large amount of water-containing low crystalline substances in the long term, so crystals are formed after immisification in the short term and immissed in the new crystal phase.

Ultimately, it is geochemically fixed as a trace component in a stable silicate mineral phase represented by quartz, and insoluble is completed in an extremely stable state.



Process of improvement of hazardous substances



Compliance with contaminated soil

Manufacture of reinforced block " Kite "

Wood

Lime

Iron oxide-containing minerals

Base material (permeable water and water insulation material)
Actual condition microscope mirror

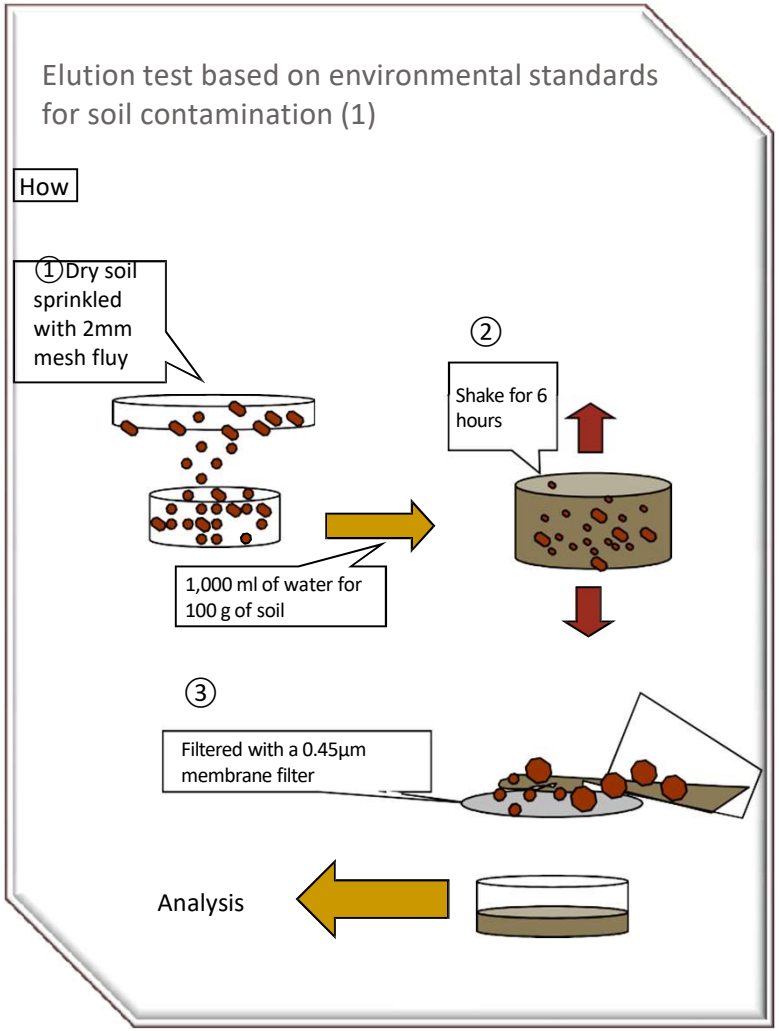
- The left is a micrograph of the actual condition of the base material

As you can see in the photo, mountain sand, silicon oxide, etc. can be seen.

Hazardous substance elution test method

Elution test based on environmental standards for soil contamination (1)

How



Acceleration test (2)

This is an elution test method that evaluates the stability of insoluble treatment technology.

It was thought that heavy metals could elute when insoluble soil is exposed to acids or alkalis.

If you pass the following tests, it is considered that elution of heavy metals, etc. will not occur even if exposed to some acids and alkalis after treatment.

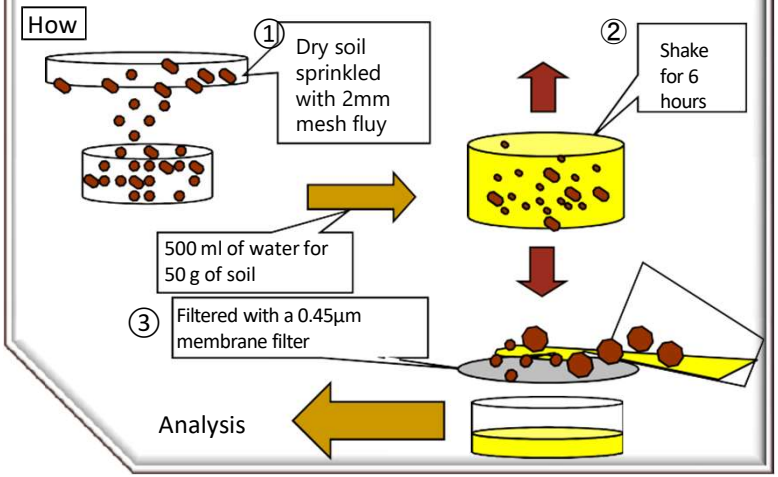
When exposed to acid

Acid rain is 4.0 pH and rainfall is 2,000 mm. In search of annual rainfall, 100 years' amount of rainfall (acid addition elution test I) and 500 years' amount of rainfall (acid addition elution test II) were set. Sulfuric acid, hydrochloric acid, and nitric acid are used

When exposed to alkali

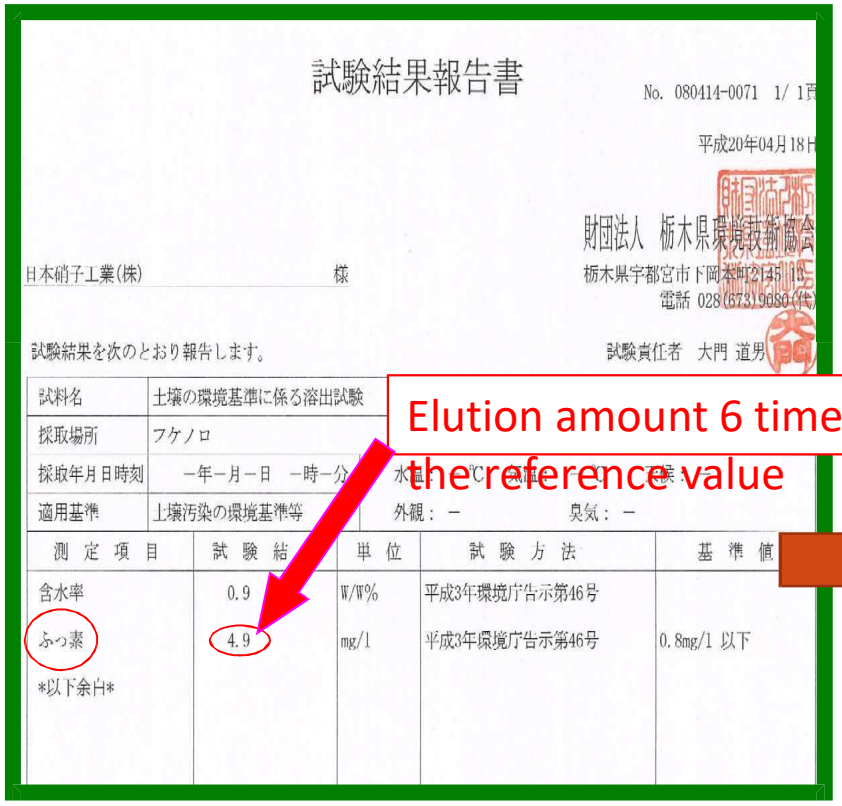
Assuming exposure to cement, alkali is slaked lime. More than the acid addition rate is set, and slaked lime (slaked lime addition elution test I) equivalent to 500 years' dose of acid rain with pH 4.0, and 10 times that of slaked lime (slaked lime addition elution test II).

How



Elution test results Waste from a metalworking manufacturer

Before processing



試験結果報告書

No. 080414-0071 1/ 1頁

平成20年04月18日

財団法人 栃木県環境技術協会

栃木県宇都宮市下岡本町2145-13

電話 028(673)9080(代)

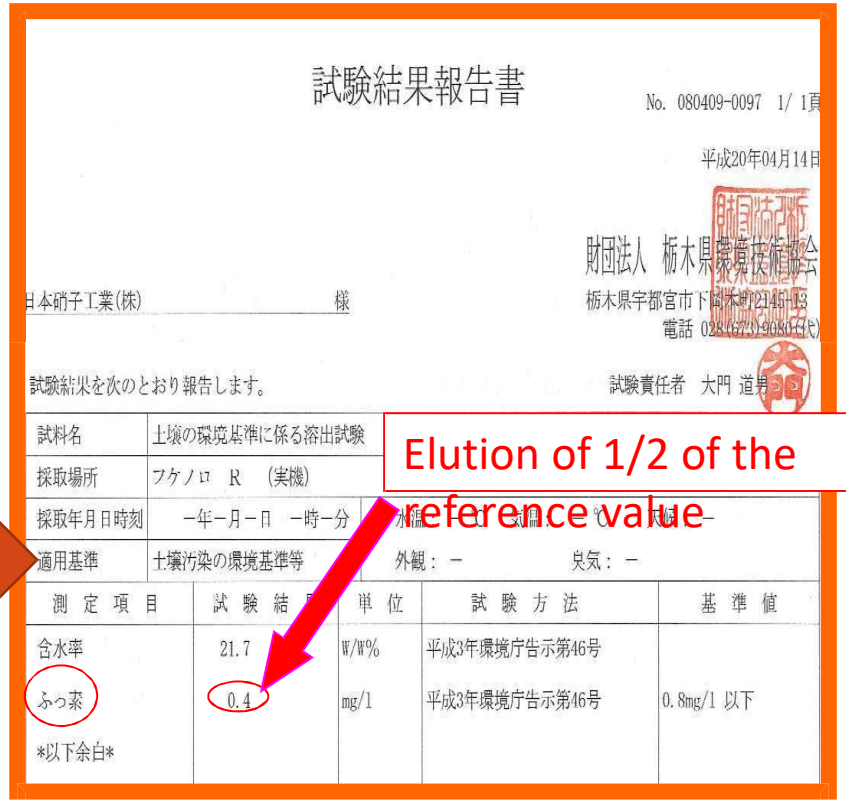
日本硝子工業(株) 様

試験結果を次のとおり報告します。 試験責任者 大門 道男

試料名	土壌の環境基準に係る溶出試験			
採取場所	フケノロ			
採取年月日時刻	－年－月－日 －時－分	水温 －℃ 気温 －℃ 天候 －		
適用基準	土壌汚染の環境基準等	外観： － 臭気： －		
測定項目	試験結果	単位	試験方法	基準値
含水率	0.9	W/W%	平成3年環境庁告示第46号	
ふっ素	4.9	mg/l	平成3年環境庁告示第46号	0.8mg/l 以下
以下余白				

Elution amount 6 times the reference value

After processing



試験結果報告書

No. 080409-0097 1/ 1頁

平成20年04月14日

財団法人 栃木県環境技術協会

栃木県宇都宮市下岡本町2145-13

電話 028(673)9080(代)

日本硝子工業(株) 様

試験結果を次のとおり報告します。 試験責任者 大門 道男

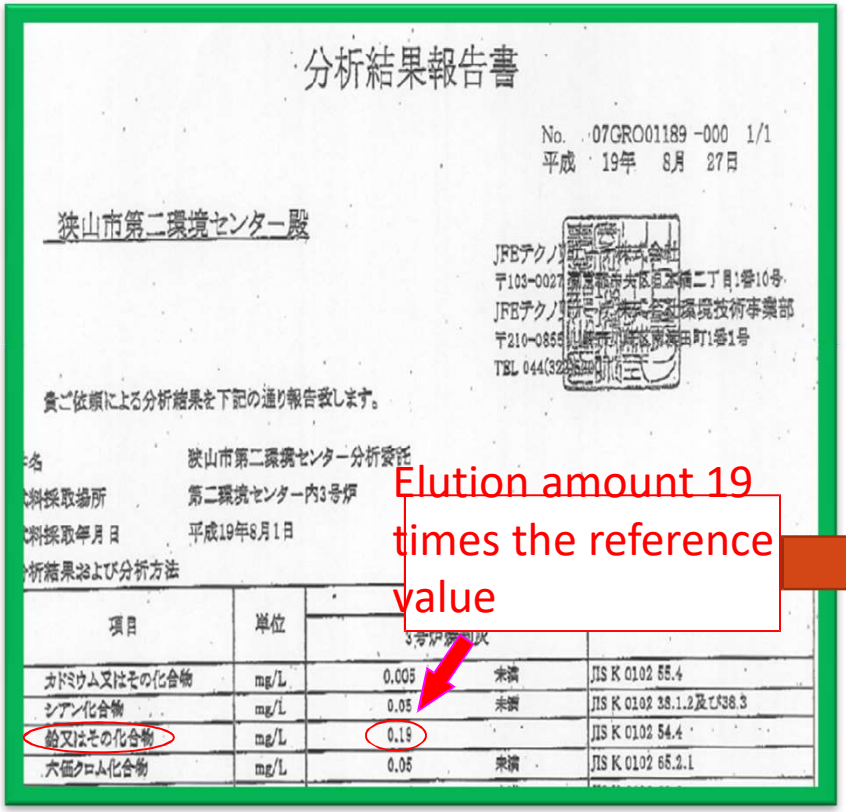
試料名	土壌の環境基準に係る溶出試験			
採取場所	フケノロ R (実機)			
採取年月日時刻	－年－月－日 －時－分	水温 －℃ 気温 －℃ 天候 －		
適用基準	土壌汚染の環境基準等	外観： － 臭気： －		
測定項目	試験結果	単位	試験方法	基準値
含水率	21.7	W/W%	平成3年環境庁告示第46号	
ふっ素	0.4	mg/l	平成3年環境庁告示第46号	0.8mg/l 以下
以下余白				

Elution of 1/2 of the reference value

Elution test results Sayama City incineration ash

Before processing

After processing



分析結果報告書

No. 07GRO01189 -000 1/1
平成 19年 8月 27日

狭山市第二環境センター殿

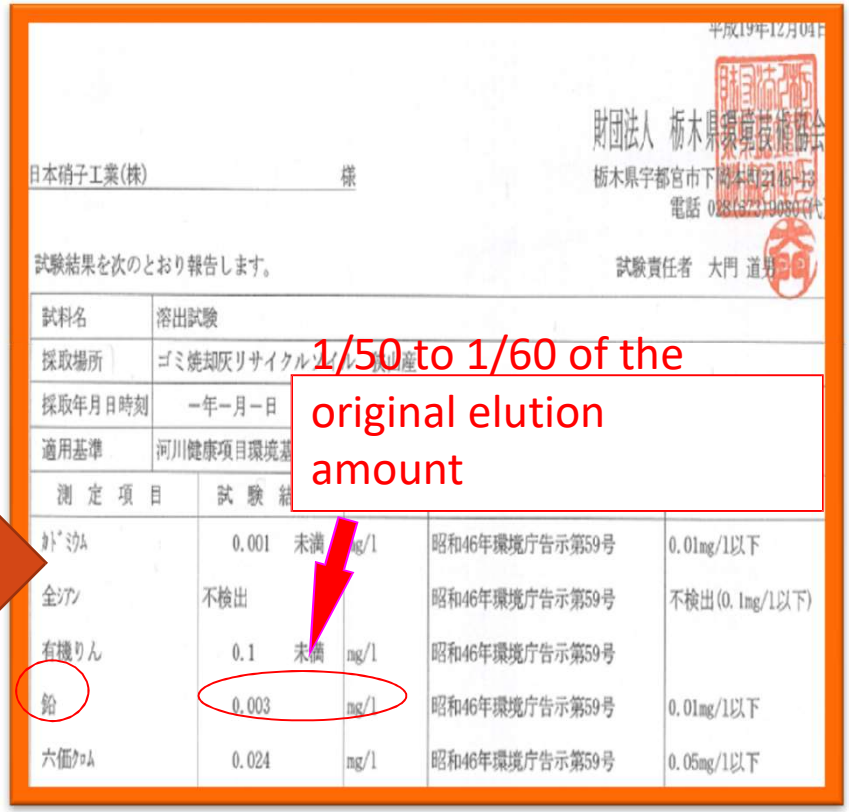
JFEテクノ[illegible]株式会社
〒103-0027 東京都中央区日本橋二丁目1番10号
JFEテクノ[illegible]株式会社 環境技術事業部
〒210-0855 川崎市川崎区水江町1番1号
TEL 044(322)[illegible]

貴ご依頼による分析結果を下記の通り報告致します。

件名	狭山市第二環境センター分析委託
試料採取場所	第二環境センター内3号炉
試料採取年月日	平成19年8月1日
分析結果および分析方法	

項目	単位	3号炉測定		
カドミウム又はその化合物	mg/L	0.005	未満	JIS K 0102 55.4
シアン化合物	mg/L	0.05	未満	JIS K 0102 38.1.2及び38.3
鉛又はその化合物	mg/L	0.19		JIS K 0102 54.4
六価クロム化合物	mg/L	0.05	未満	JIS K 0102 65.2.1

Elution amount 19 times the reference value



平成19年12月04日

財団法人 栃木県環境技術協会
栃木県宇都宮市下[illegible]
電話 028(627)[illegible]

日本碍子工業(株) 様

試験結果を次のとおり報告します。 試験責任者 大門 道男

試料名	溶出試験
採取場所	ゴミ焼却灰リサイクル[illegible]搬出産
採取年月日時刻	ー年ー月ー日
適用基準	河川健康項目環境基

測定項目	試験結			
ｶﾄﾞﾐｳﾑ	0.001 未満	mg/l	昭和46年環境庁告示第59号	0.01mg/l以下
全ｼｱﾝ	不検出		昭和46年環境庁告示第59号	不検出(0.1mg/l以下)
有機りん	0.1 未満	mg/l	昭和46年環境庁告示第59号	
鉛	0.003	mg/l	昭和46年環境庁告示第59号	0.01mg/l以下
六価ｸﾛﾑ	0.024	mg/l	昭和46年環境庁告示第59号	0.05mg/l以下

1/50 to 1/60 of the original elution amount

Patent pending (related to this project)

Blocks using water purification soil and their molding methods

Patent disclosure2007-320825

The present invention uses a water purification generated soil discharged from a water purification plant to maintain a constant strength and provide a block body excellent in permeability and the like.

Block body using general garbage incinerated ash

Patent application2008-132301

The present invention uses garbage incineration ash discharged from an incineration plant to maintain a constant strength and provide a block body excellent in permeability and the like.

How to improve contaminated soil

Patent application2008-132298

The present invention relates to a method that can be used in the same way as general soil by mixing contaminants with a specific composition with regard to soil improvement techniques of contaminated soil.

Surface spraying composition, surface structure, and its construction method

Patent disclosure2006-336386

We propose to increase the fixing power to the slope of steep inclination, and propose a surface structure in which plants do not grow above a certain height and a construction method.

Landfill solidification layer greening method

Patent disclosure2005-054477

A solidified layer mainly made of solid sand soil is arranged in the soil, and a buried solidified layer greening method required for plant growth control and root system elongation using natural materials is provided.

Soil covering materials for cultivation and soil covering methods using them

Patent disclosure2004-208608

A crop soil covering material that is easy to install, easy to disintegrate, requires no time to remove, does not require disposal, and can sufficiently secure weed control functions.

Greening blocks and their molding methods

Patent disclosure2004-065252

The roots of the grass and the cultivated soil are strongly integrated, and at the time of final treatment, it can be easily crushed, and greening blocks that can be reduced to natural soil and their molding methods are obtained.

Composition of powder for underfloor use and method for constructing an underfloor solidified layer using it

Patent disclosure2006-306685

It is solidified at the construction site, and after solidification, it has excellent moisture absorption and release properties, has moderate strength, and provides a composition mixture that is easy to return to the soil without having to cause waste problems.

Soil block with both a positive posture and permeability

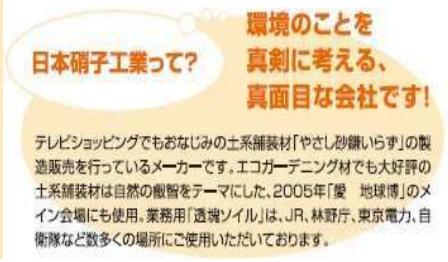
Patent disclosure2005-183431

It is an inorganic material with excellent water retention and permeability, relatively small specific gravity, and moderate toughness, and provides a block body that is an inorganic material that is easy to return to the soil.

Reuse Patents

Other patents

Added menu of reuse block " Kite "



In this way, industrial waste is reborn in various shapes.