

JICA, Road Infrastructure Seminar
(28, JAN, 2020)

Cold type repair materials of TOA

(TOAの常温型補修材料)



TOA ROAD CORPORATION

Technical Department

General Manager, Nagato ABE



TOA ROAD CORPRATION, LTD.

A stylized illustration of Mount Fuji, the highest mountain in Japan, with its snow-capped peak. The mountain is rendered in shades of green and yellow, set against a light blue sky. The foreground shows rolling hills in various shades of green and blue.

COMPANY BROCHURE

TOA ROAD CORPORATION is...

- Independent pavement construction company
- The only company in Japan which has construction, asphalt mixture and product manufacturing department
- Pioneer of asphalt emulsion in Japan



Reconstruction

Head Office (Roppongi, Minato-ward, Tokyo)

Company Profile

- ◆ **Founded :November 28, 1930**
- ◆ **Capital 7.5 billion yen**
- ◆ **President: Kyoichi Morishita**
- ◆ **Employees: 947 people.**
- ◆ **branch offices: 8, sales offices of 46 places, products factory is 24 points, the mixing factory is 45.**
- ◆ **Research Laboratory, 1**
- ◆ **Sales 88.12 billion yen.**
- ◆ **Ordinary income 4.88 billion yen.**
- ◆ **Net income 3.03 billion yen.**
- ◆ **Group companies 27 companies.**
- ◆ **Employees: 1,400 people.**
- ◆ **Sales 118.85 billion yen.**
- ◆ **Ordinary income 7.71 billion yen.**
- ◆ **Net income 4.12 billion yen.**

BUSINESS AREA



[▲ Page top](#)

ROAD CONSTRUCTION

General Roads

Expressways

CIVIL ENGINEERING

Public Works

Railway Track Construction

LANDSCAPING, SPORTS FACILITY

Park, Tennis Court , Field Truck

ASPHALT PRODUCTS

Emulsified Asphalt

Modified Asphalt

Hot Mix Asphalt

ENVIRONMENTAL

Demolition of buildings

Collection & Transportation

Intermediate Processing/Reclamation

Final Disposal

Cold type repair materials of TOA

Selection of repair method for asphalt pavement

		Category of repair method	
		Method of the pavement function	Method of the pavement structure
Depth range covered by countermeasures	Surface course only	Preventive maintenance or First aid measures	
		<div style="border: 2px dashed red; border-radius: 50%; padding: 10px; display: inline-block;"> Milling Surface treatment Sealing material injection Patching Rubbing the steps </div>	
		Overlay of wheel path	
		Thin overlay ▪ Overlay	
	Binder course		Replacement of surface and binder layers

Five repair material capable construction at room temperature with excellent portability

- ① Sealing material injection method → RC mainte
- ② Patching method → Cold per mix
- ③ Emergency repair material (pothole) → TOKE-Pack
- ④ Method of leveling on the steps → Patch good
- ⑤ Non-slip water-based road surface paint → EG color

Room temperature repair material corresponding to sealing material injection method; RC maintenance

Main material ;
340g



Hardener material ;
20g

RC maintenance easy to inject



Remove the cap of the main bottle



Remove the cap of the hardener bottle



Put the hardener into the main bottle



Open traffic after 30 minutes of curing



Inject into cracks within 10 minutes



Shake the main bottle

Features of RC maintenance (compared to hot type)

- ① Since it does not require any heating, it is easy to handle.
- ② It can handle from wide cracks to narrow cracks.
- ③ Can be reliably injected even in strong winds..
- ④ Excellent penetration even in wet cracks.
- ⑤ The package is easy to adjust the constructor time and curing time.

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High strength cold repair material corresponding to patching; Cold par mix



Home center : At Cainz
Home Material Center

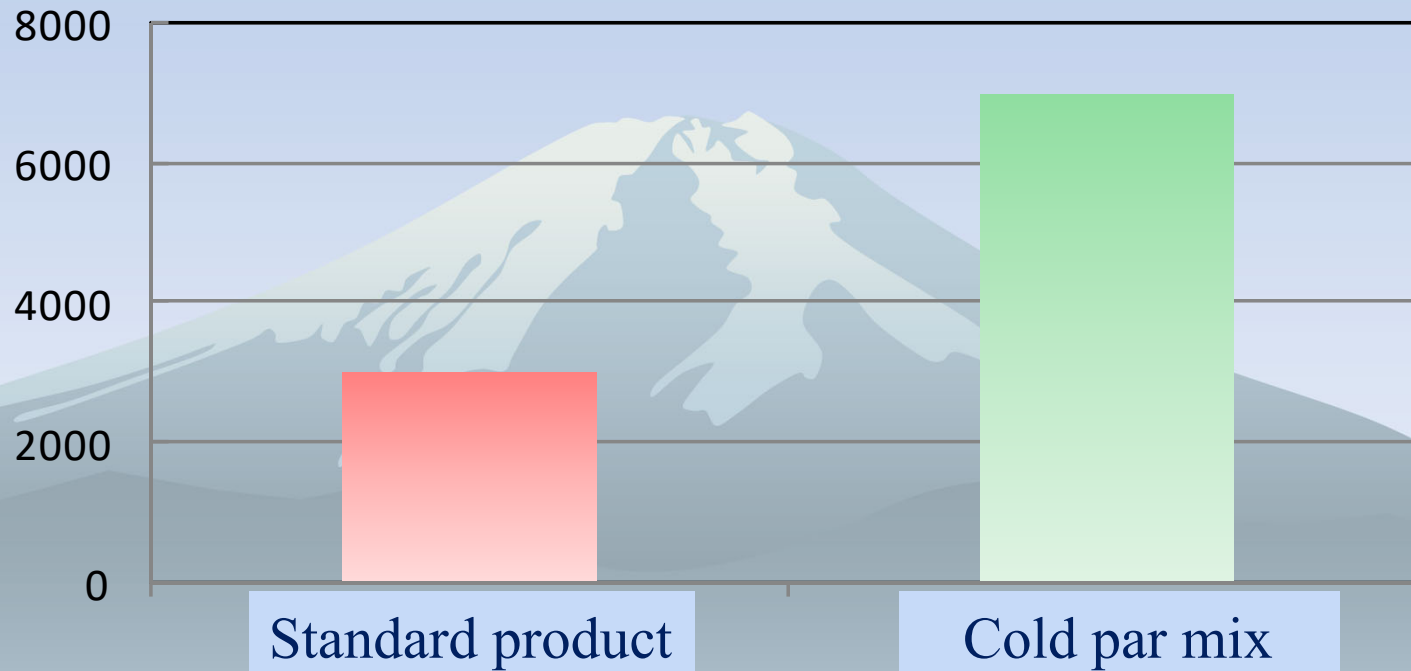
Solid asphalt
(20kg, 1980 yen)

Features of cold permix

- ① It is not easily affected by the work environment and is easy to handle because it is installed at cold temperature.
- ② Because it contains a special resin, it has excellent durability and water resistance.
- ③ Since it is excellent in adhesiveness and water resistance between aggregates, it can be constructed even when the road surface is wet.
- ④ Because of the high stability of the mixture, traffic can be opened immediately after construction.
- ⑤ If unopened, **long-term storage (12 months)** is possible.
- ⑥ Since 5mm TOP aggregate is used, it is easy to match the repair shape.

Example of Cold Per Mix characteristics (plastic deformation resistance)

Dynamic stability (pass / mm)



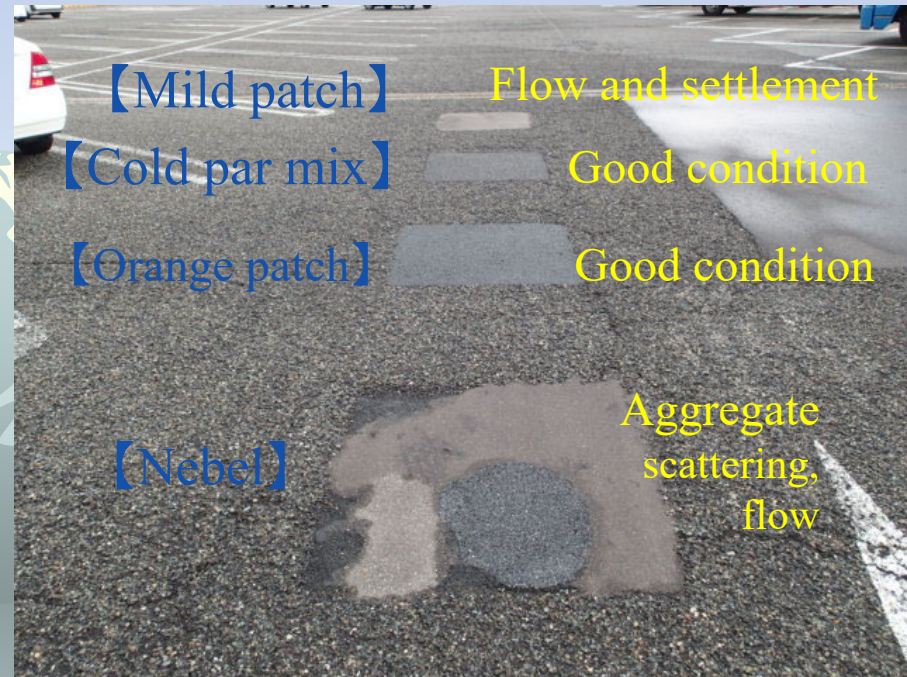
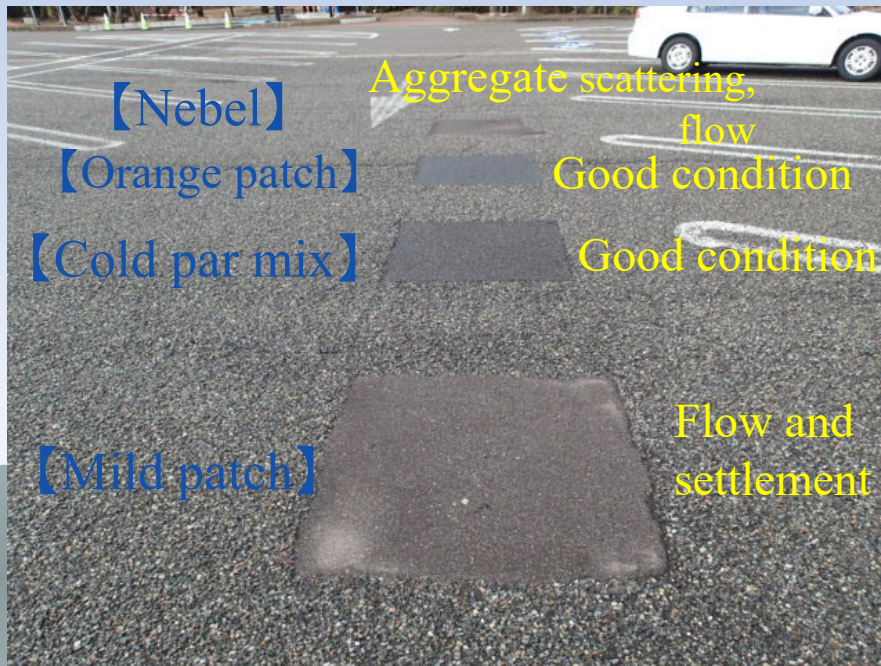
Curing conditions: 60 degrees, 7 days
Test temperature: 20 degrees

Field comparison test of cold temperature mixture



Field comparison test : March 27, 2014
NEXCO Hokuriku Expressway, AmaGozen SA

Field comparison test of cold temperature mixture 1 year after service



Field comparison test Survey: March 28, 2015
NEXCO Hokuriku Expressway, AmaGozen SA

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Emergency repair material for potholes TOKE pack



①. Advance preparation

When the inside of the pothole is dry, water is sprayed to make the inside of the pothole wet.



The size of one bag is A5 size of 130mm x 210mm, and the thickness is about 10mm. The weight is 0.5kg.



②. Lay up

Lay bags in the potholes.

In the case of two-tiered layers, water is sprayed between layers.

* Be careful not to make the finished surface excessively convex to prevent scattering.

Emergency repair material for potholes

TOKE pack



③. Treading

After laying down, step on and finish.

* If water is sprayed after treading, it will adhere more closely.

④. Completion of Pot hole filling

* The bag will dissolve in water.

* Even during the next overlay, adhesion to the new surface material will not be hindered.

⑤. Open traffic

The traffic can be opened immediately after the trampling. It takes **about 1 minute** to open the traffic.

* Rolled by vehicle traffic and filled to the end of the pothole.

Features of TOKE ▪ Pack

- ① Can be constructed even on wet surfaces such as rainy days.
- ② The material is an A5 size bag that can be operated with one hand without using a scoop.
- ③ After laying down, it is hardened just by treading with your foot, so no rolling machine is required. Since the traffic can be opened in **about one minute**, the safety of workers is enhanced.
- ④ Gradually leveled as the vehicle travels, filling up to the end regardless of the pothole shape.
- ⑤ Tack coat and primer are not required.
- ⑥ TOKE pack bags are soluble in water, so they are environmentally friendly products with no waste.
- ⑦ Adheres to the new surface material during the next overlay.
- ⑧ The stability of the mixture is excellent and it can be stored for about 6 -12 months.

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Repair material for leveling of steps : Patch Good



Repair procedure of "Patch Good"



Put the hardener in the aggregate bag



Mix while holding the aggregate bag



The resin is put into the aggregate bag after mixing.



Open traffic after 30 minutes of curing



Apply anti-skid aggregate before hardening



Use a metal trowel to rub against the road steps

Typical mixture properties of Patch Good

Item	Test results		Test methods
Density	1.9 g/cm ³		JIS K 5665
Usable time	8 minutes (25 Celsius degree)		JIS K 6901
Compressive strength	11.5 N/mm ²		JIS R 5201
Bending strength	10.0 N/mm ²		
Adhesive strength	Concrete surface	2.6 N/mm ² (Substrate destruction)	JIS A 6909
	Asphalt surface	1.7 N/mm ² (Substrate destruction)	



“Patch Good” can be rubbed with a Metal trowel on a step with the road surface around the manhole.

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-

水性だから安全・安心
誰でも簡単に施工できる!

すべり止め水性塗料

EGカラー

EGカラーは、古くなったアスファルト舗装やコンクリート舗装を簡単にカラー化できる塗料です。EGカラーは、耐久性に優れ、高いグリップ力で安全な路面を提供します。ローラバケなどを使い簡単に施工ができるため、専門技術者を必要としません。

EGカラーの特徴

- 1** 水性だから安全・安心 誰でも簡単施工
 ローラバケで
 本製品のみで優れた付着性が得られます。ローラバケなどを用いて誰でも簡単に施工できます。*一部コンクリートは、プライマーが必要な場合があります。
- 2** 濡れた路面でも安全な 優れたグリップ感
 人、車両、車椅子、自転車などがスリップすることないハイグリップで安全な路面を提供します。
- 3** 車両の走行にも耐える 優れた耐摩耗性・耐久性
 特殊アクリルエマルジョンとすべり止め細骨材を組み合わせることによって、薄層でありながら優れた耐摩耗性を実現しました。
- 4** 垂れにくく 壁面にも利用可能
 コンクリート・アスファルト舗装はもちろん、垂れにくい壁面*（コンクリートやブロック）にもご利用いただけます。*材質によっては充分に付着しない場合があります。



スタンディングパウチ入り

Safe and secure because it is water-based

Anyone can easily paint!

EG Color

EG Color is a paint that can easily color old asphalt pavement and concrete pavement surfaces. Excellent durability and provides a safe road surface with high grip.

Since it can be easily constructed with a roller brush, it does not require a specialist.



Capacity 2kg

Drying time

[summer] about 1 hour [winter] about 2 hours

Vehicle opening time

[summer] about 6 hours [winter] about 12 hours

Standard use amount

0.3kg / m², 2 coats : due to uneven surface

1 bag application area

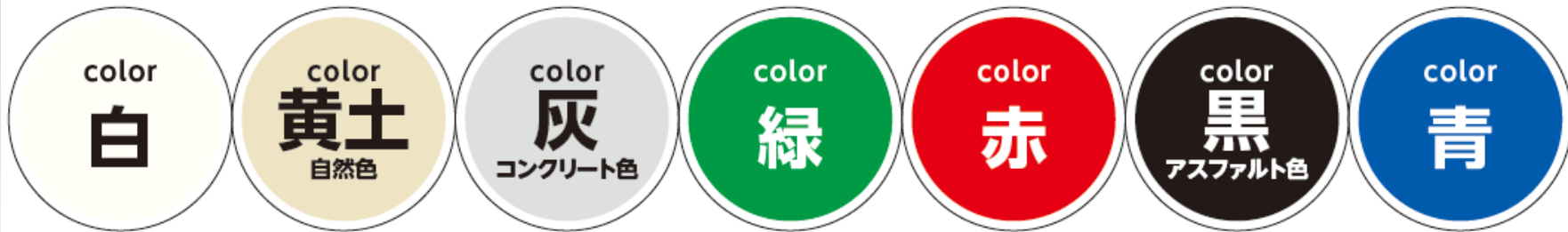
About 2~3m²

All
7 colors

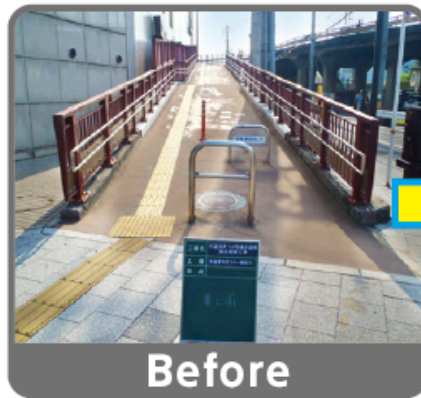
Color variation of EG color

Finished color image

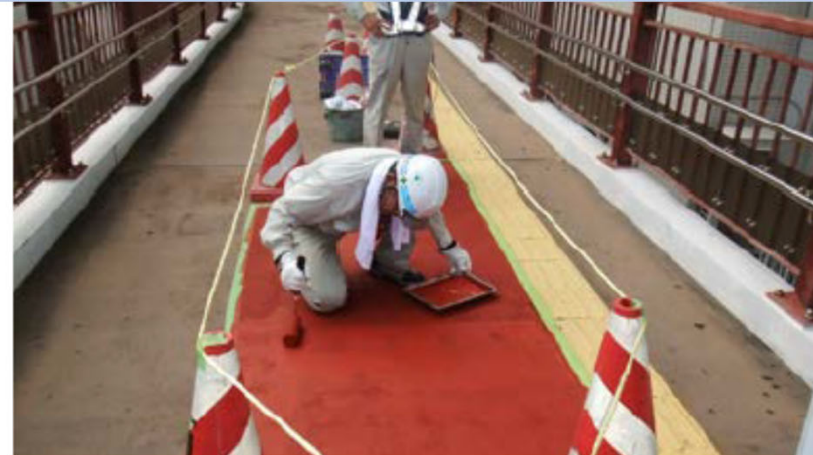
印刷物のため色が異なることがあります



Construction example



Repaint the pavement of the pedestrian bridge by EG Color



1 層目

2 層目



着工前

完成



Repainting the first layer of the EG color produces uneven colors. In the case of construction in May, it takes about 30 minutes to dry. After that, the second layer of EG color was painted and completed.

Finally

We manufacture and sell repair materials for various applications with the aim of ensuring performance and safety on road surfaces.

The contents introduced here are intended to be easily constructed on-site at room temperature, and to extend the life by repair.

In addition, we also deal with modified asphalt for long life pavement and waterproofing material for bridge pavement. If you have any requests or questions, please contact Tani or Abe.

Q&A

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Thank you for your attention.

