

## Epoxy-Asphalt Pavement for Steel Plate Deck

# KT-BEP & KT-HYP



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## Epoxy Asphalt Pavement 「KT-BEP」

**KT-BEP** is a pavement by adding flexible epoxy resin to the asphalt to create epoxy asphalt compound and it is an excellent pavement material having the flexibility and construction property of asphalt and toughness of epoxy resin.

Epoxy asphalt compound has high resistance in the beginning against rutting, has fluidity and very high durability against repeated bending fatigue compared with ordinary asphalt compound. In addition, not only in places that needs countermeasure for rutting and flow such as high-load roads, it is an ideal compound in pavement for such a

Especially a secondary merit of reducing economic loss caused by traffic congestion due to repair works because the life cycle of the pavement will become long on roads and bridges wherein securing diversion is difficult on major roads.

- KT-BEP is the epoxy asphalt pavement was added to the epoxy resin asphalt mixture
- KT-BEP having high fatigue endurance against repeated bending
- Fluidity and rutting resistance is superior to a general asphalt mixture.
- Using the material of low temperature dependency obtaining excellent characteristics within a wide temperature range.
- Can be used existing asphalt plants for manufacturing heated asphalt mixture

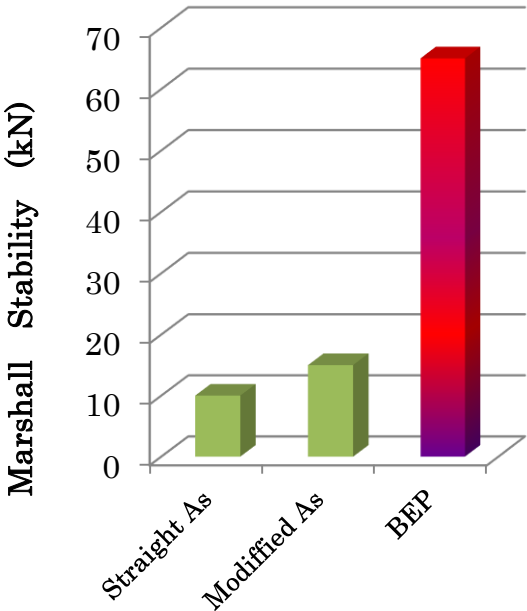
### Characteristics Value of KT-BEP

#### 1. Strength Characteristics

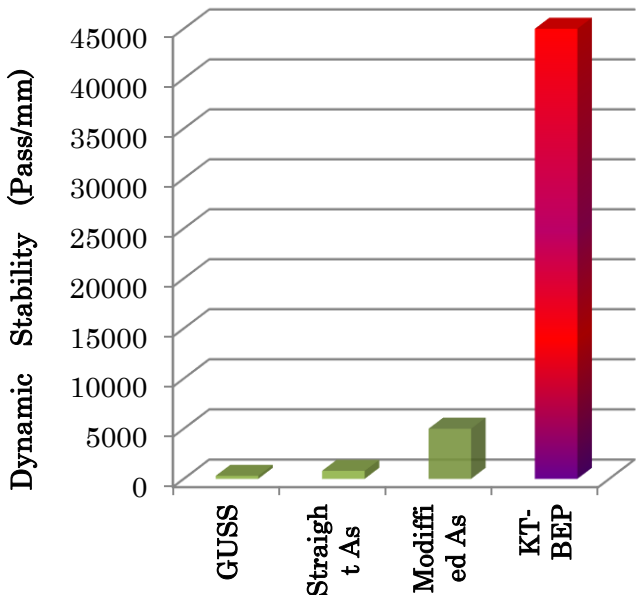
This is the tested result of strength characteristic of KD-BEP.

It has very high strength compared with normal asphalt mixture. It exert strength more than times of straight asphalt pavement for **Marshal stability** and **Dynamic Stability** which shows rutting resistance.

<Marshall Stability of Asphalt Mixture>



< Dynamic Stability of Asphalt Mixture>



## 2. water resistance and oil resistance.

Photo 1. When immersed for 30 minutes in 80°C of water, Straight Asphalt peels off the asphalt from aggregates. However, Epoxy Asphalt does not peel off.

Photo 2. This is the picture immersed for 1 hour in light oil. Straight asphalt melts in light oil while epoxy asphalt doesn't melt and there will be no effect to pavement even if oil leaks from vehicle accident.



Photo1: Test of Water resistance

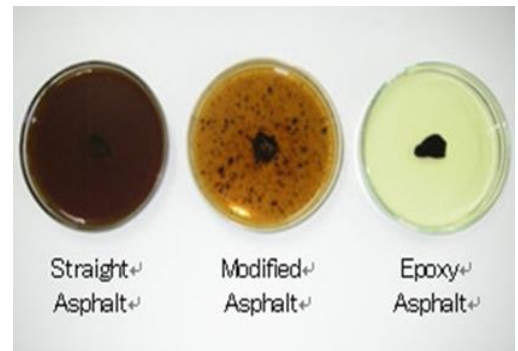
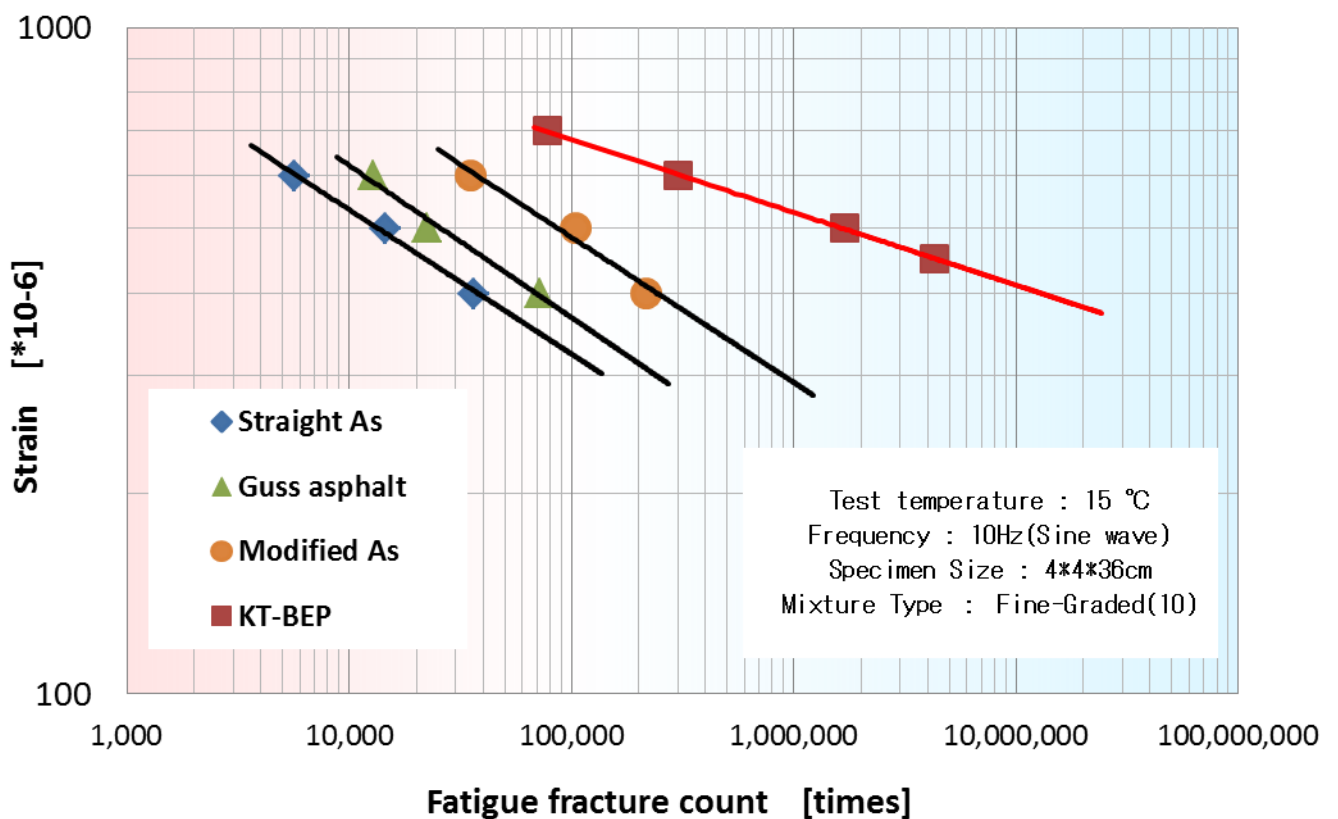


Photo2: Test of Oil resistance

## 3. Flexural Fatigue

Next is the test result on fatigue resistance which is a problem on steel slab pavement. This test shows graph of relationship of setting distortion and damage count of the 4 repeated fatigue test. From this, epoxy asphalt has very high fatigue resistance than straight asphalt and gush asphalt.



# Waterproofing Adhesive 「KT-HYP」

**KT-HYP** is a special waterproofing adhesive of high elastic epoxy resin. Its characteristics after initial hardening is softening and dissolution through heat of the heated asphalt mixture within a certain time. Moreover, hardening of resin is promoted by heat of the asphalt mixture after the paving and it exerts the function immediately.

Since KD-HYP has very good performance in adhesive strength and water resistance after hardening, it has big effect in the improvement of water-proofing and antirust of steel slab and concrete and in the improvement of durability by unifying the pavement of road with steep slope

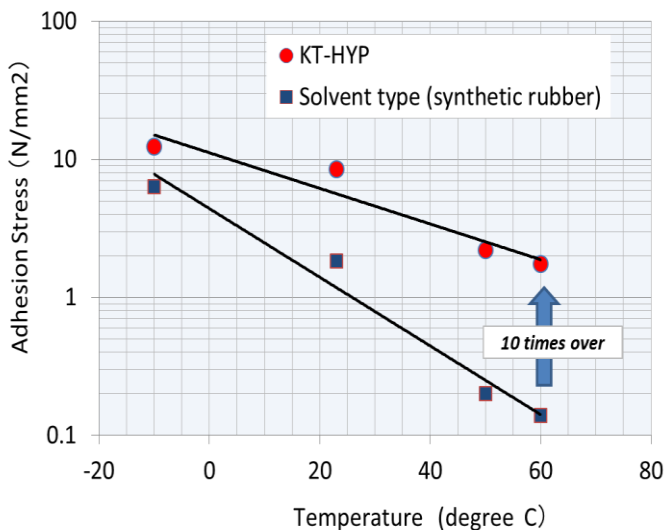
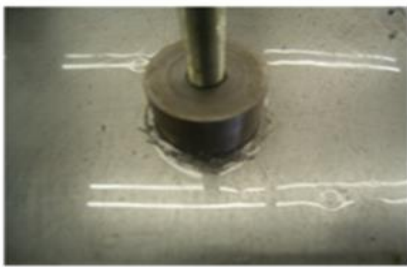
## Characteristics Value of KT-HYP

### 1. Bonding Strength

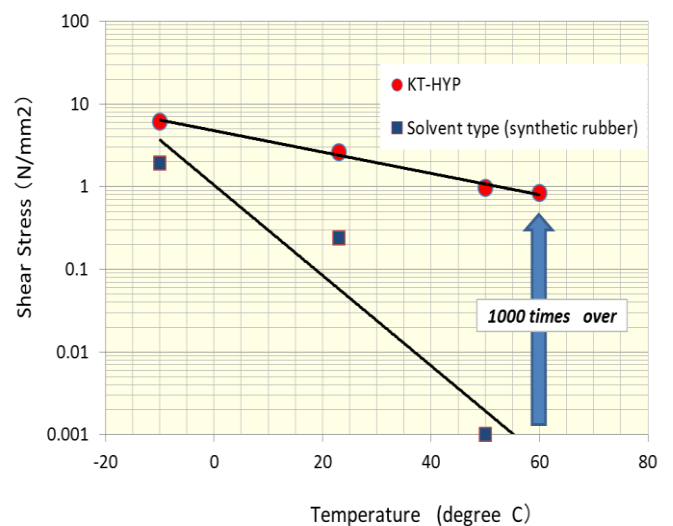
For the bonding performance of KT-HYP, it has high bonding strength and 10 times bonding strength on high temperature range compared with solvent type binder which is used as binder of normal bridge pavement based on the bonding test result wherein temperature was changed.

Test was also conducted in the shear stress applied in bonding surface of pavement and slab. KT-HYP is excellent same with bonding strength and exerts 1000 times shear stress than normal asphalt on hot temperature.

Adhesion Stress Test



Shear Stress Test



## Construction Procedures of KT-BEP and KT-HYP (Epoxy Asphalt Pavement)

### Application of KT-HYP

KT-HYP shall be applied on the steel slab.

This method of application can be done using spray or apply manually.



Shot Blasting



Painting with Hand Roller



Spreading with Spray

### Production of KT-BEP

This is the manufacturing of KT-BEP (Epoxy asphalt mixture). The manufacturing method is almost the same with normal asphalt mixture. Epoxy resin KT-BEP is placed only when mixing in mixer on normal asphalt plant.

The method of placing is using simple pump, manual dumping with buckets.



#### Mixing Condition

Time		Temperature
Dry	10 ~	170~185°C
	15sec	
Wet	45 ~	
	50sec	

### Paving of KT-BEP

The pavement of **KT-BEP** (Epoxy Asphalt Mixture) is the same with normal asphalt pavement and applied by leveling using **ordinary asphalt finisher** and compacted using **ordinary roller**.

(Construction Machine for Pavement)



Dump Truck



Asphalt Finisher



Roller

(Standard Value for Execution Management)

Article			Standard Value
Condition of Construction	Temperature of Paving and Floating	Internal Temperature	$\geq 160^{\circ}\text{C}$
	Temperature .of First Compaction	Internal Temperature	$\geq 155^{\circ}\text{C}$
	Temperature .of Second Compaction	Surface Temperature	$\geq 110^{\circ}\text{C}$
	Temperature .of Finishing Compaction	Surface Temperature	$\geq 90^{\circ}\text{C}$
Usable time			2 hours