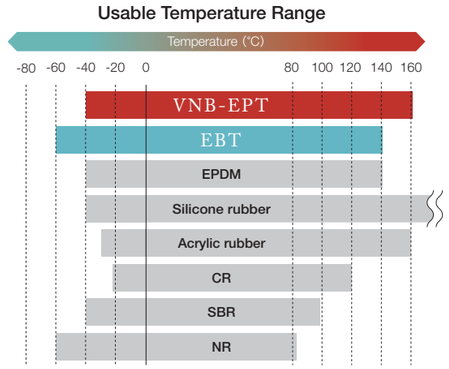
Mitsui Chemicals' new lineup expands the range of applications for synthetic rubber

Mitsui Chemicals was the first company to domestically produce EPDM (ethylene-propylene rubber) using its industry-leading polyolefin polymerization technology and has since expanded its applications into a wide range of fields. VNB-EPT and EBT were developed to meet the needs of the times for miniaturization, high durability, and improved processability.
In addition to demonstrating excellent properties at high and low temperatures, they also feature environmental advantages compared to other materials, such as resource conservation through improved product durability, halogen-free design, and reduced outgassing.
They are excellent new materials that can replace CR, acrylic rubber, and silicone rubber.



Polymer Properties

VNB-EPT	PX-006M	PX-008M	PX-009M
Polymerization catalys (dienes)	Metallocene (VNB)	Metallocene (VNB)	Metallocene (VNB)
ML(1+4)125℃	69	46	10(100℃)
Ethylene content(wt%)	60	60	60
Diene content(wt%)	1.5	1.5	1.5
Oil extension(phr)	0	15	0

EBT	K-8370EM	K-9330M
Polymerization catalyst (comonomers)	Metallocene (butene)	Metallocene (butene)
ML(1+4)125℃	54	30(100℃)
Ethylene content(wt%)	50	50
Diene content(wt%)	4.7	7.1
Oil extension(phr)	30	0

*This product is under development, and the polymer properties are subject to change.
*The data in this document is a representative example of the values measured by our test method, and it should not be construed as any type of guarantee of performance.
*This product has been developed and designed for general industrial applications. It cannot be used for medical or food applications.
*For more detailed safety information, please refer to the Material Safety Data Sheet.

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Mitsui Chemicals

State-of-the-art synthetic rubber resistant to high and low temperatures

VNB-EPT

EBT

VNB-EPT
Examples of Applications

- Heat-resistant hoses — Water hoses, turbocharger hoses, air hoses, etc.
- Belts — Transmission belts, conveyor belts
- Anti-vibration rubber — Muffler hangers
- Gaskets

EBT
Examples of Applications

- Gaskets, packing
- Belts — Friction compounds, adhesive rubber layers

High durability and wear resistance even at high temperatures for a long service life.

VNB-EPT

Excellent mechanical properties: Wear resistance — Heat aging resistance

This is a wear-resistant PO cross-linking grade designed to achieve a good balance between heat aging resistance and mechanical properties.

Featuring excellent low-temperature flexibility and green tack.

EBT

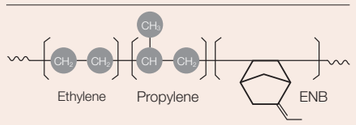
Low-temperature flexibility — Viscosity

Compared to conventional EPDM, EBT has better low-temperature properties and superior low-temperature flexibility and green tack. It is a new synthetic rubber featuring easy processability.

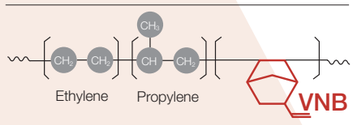
VNB-EPT Structure

Of the three elements of EPDM (ethylene, propylene, and diene), diene has been changed from the general ENB type to the VNB type.
Low-branched polymers using VNB-type dienes with good reactivity take on a uniform cross-linked structure after cross-linking.

EPDM

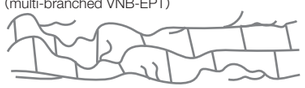


VNB-EPT



Cross-linking by conventionalmethods

Many free ends
(multi-branched VNB-EPT)



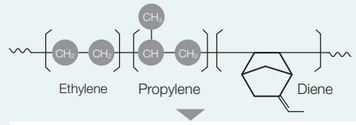
Cross-linking of novel metallocene catalysts

Low-branched VNB-EPT has a uniform cross-linked structure

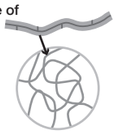
EBT Structure

The polymer design was changed from an ethylene-propylene-diene composition to an ethylene-butene-diene composition. The copolymerization of butene in the comonomer has improved the mobility of the polymer main chain compared to conventional EPDM.

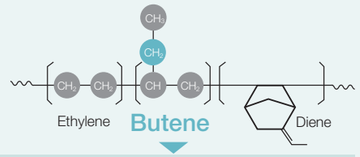
EPDM



Structural image of EPDM



EBT



Structural image of EBT

Physical Property Data

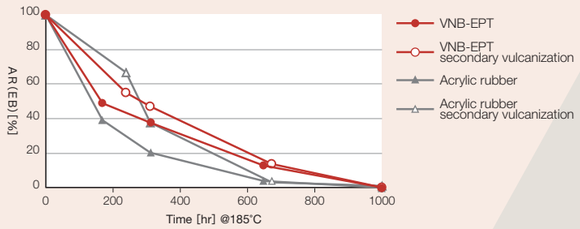
Fatigue resistance — DeMattia bending fatigue test

VNB-EPT	EPDM	Acrylic rubber
> 500,000 cycles	breakage at 300,000 cycles	> 500,000 cycles

State at 500,000 cycles

Dents occur at 100,000 cycles

Eat aging resistance — Elongation: Temperature Change



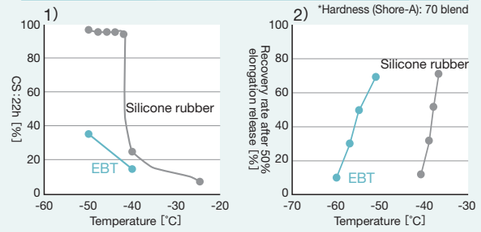
Blend content: VNB-EPT: MgO(5)/St.A(1)/FEF carbon(30)/SRF carbon(45)/FT carbon(40)/PS-430(47), Acrylic rubber: St.A(1)/HAF carbon(60)

Physical Property Data

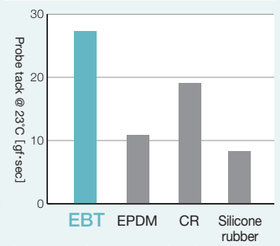
Low temperature resistance — Glass transition temperature (DSC-Tg)

	Tg	Tm
EBT	-66°C	–
EPDM	-49°C	–
CR	-39°C	–
Silicone rubber	-127°C	-41°C

Low temperature resistance — 1) Compression set: Temperature change 2) TR test: Temperature change



Viscosity — Probe tack test



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