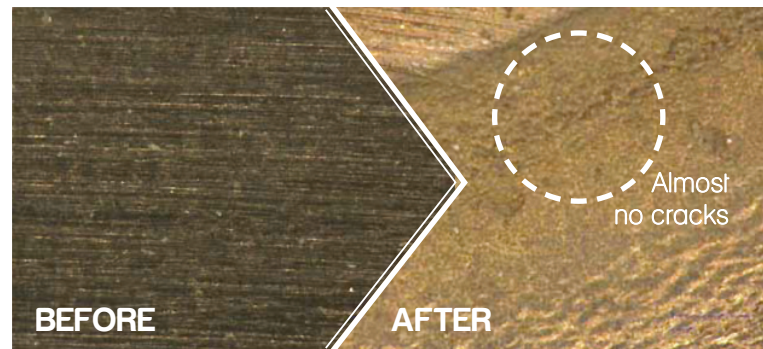


NEW EPDM

Superior resistance to heat and chemicals, having at least twice the endurance of conventional products

A NEW GASKET HAS APPEARED

THAT FAR OUTSTRIPS CONVENTIONAL EPDM IN RESISTANCE TO BOTH HEAT AND CHEMICALS.

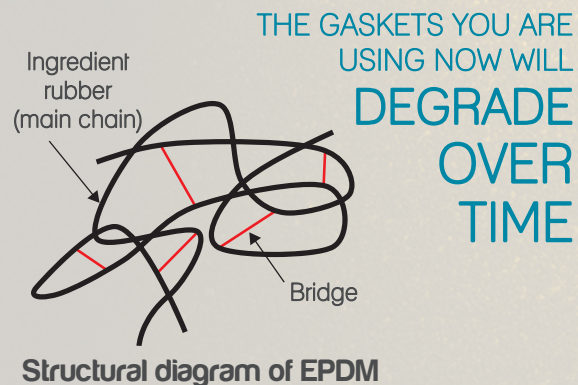


After 500 hours of heat resistance testing at 170°C

*Photograph taken with optical microscope

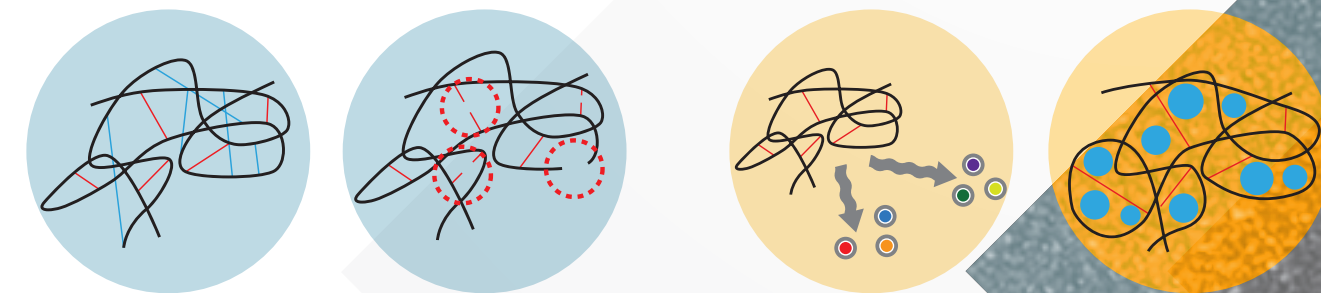
Cracks occur in the surface of gaskets as a result of increase and breaking of the bridges, due to oxidative degradation. If the cracks progress, they will cause troubles such as leakage.

Whereas NEW EPDM, with its enhanced heat resistance, will develop almost no cracks and will hardly be affected by thermal degradation during use – as can be seen from the photograph. This means it can be used with higher safety and for a longer service life than conventional products.



Weather-resistant gaskets generally use EPDM, which is a high-quality synthetic rubber. As shown in the figure on the left, EPDM has a structure made up of ethylene propylene rubber – a polymer material – as main constituent, to which vulcanizing agent is added to form bridges between the macromolecules, thus exploiting to the full the resilience that is rubber's major characteristic.

Over time however, the effects of heat, light and ozone in the use environment will result in cracks on the surface of EPDM, and if these progress, the rubber will lose the resilience, and be unable to keep up the sealing performance, that are required of gaskets for plate type heat exchangers



Degradation due to heat, light and ozone

DEGRADATION due to fluids

Measures to counter these various forms of degradation include selecting an appropriate rubber material (such as premium fluoro-rubber), and rubber compounding that yields higher performance. HISAKA's efforts using the latter method – rubber compounding that yields higher performance – have culminated in a general-purpose EPDM material with enhanced endurance.

THERE NOW EXISTS A HIGH-PERFORMANCE EPDM THAT COPEs WITH SEVERE USE ENVIRONMENTS.

Enhanced resistance to heat

NEW EPDM

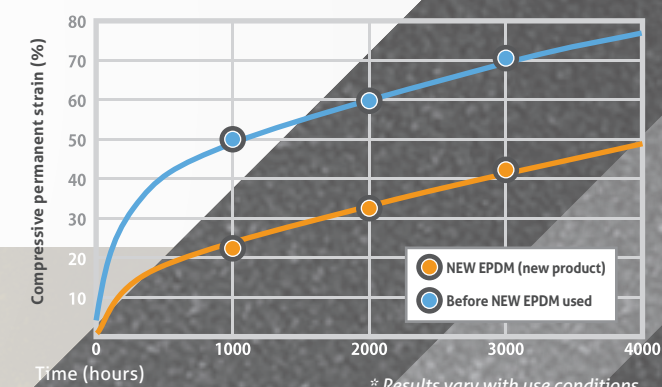
has low levels of heat-induced compressive permanent strain, and has fine sealing performance.

CONFIRMED SEALING PRESSURE UP UNTIL LEAKAGE, AFTER HEAT ENDURANCE PERIOD UNDER HIGH-TEMPERATURE THERMAL LOAD

As time pass, gaskets develop large compressive permanent strain due to thermal degradation and other factors. This means that although gaskets are resilient and give fine sealing performance at high operating pressures while their compressive permanent strain is at a low level, their resilience declines as their compressive permanent strain grows larger, ultimately resulting in the occurrence of liquid leakage.

*Strictly speaking, compressive permanent strain does not equal resilience. In the case of swelling, for example, although thickness increases, resilience decreases.

Comparison of heat resistances at 180°C



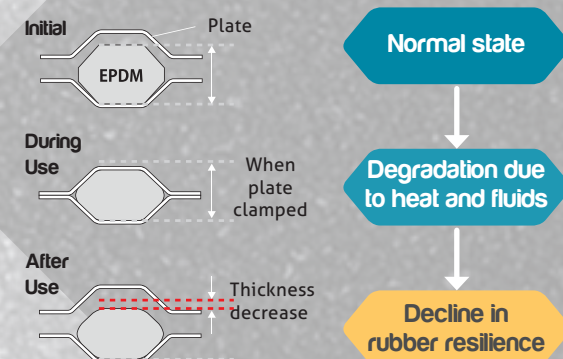
The graph above plots the heat resistances of conventional EPDM and NEW EPDM at 180°C. It can be seen that NEW EPDM's heat resistance is superior to conventional EPDM and that its compressive permanent strain has been greatly reduced.

Thus, EPDM succeeds in maintaining stable sealing performance over a more extended period than conventional EPDM.

What is compressive permanent strain (CS)?

Compressive permanent strain (CS) is a numeric value that expresses by how much a gasket's compression allowance has shrunk due to use over an extended time period. The lower the CS (%), the better the gasket can be deemed to be in terms of maintaining stable sealing performance over an extended period.

* A gasket will generally lose its sealing capability when CS = around 80 to 90%.



$$CS(\%) = \frac{\text{Initial thickness (T0)} - \text{Thickness after use (T1)}}{\text{Initial thickness (T0)} - \text{Plate compression allowance (d) (plate formation depth)}} \times 100$$

Enhanced amine-resistance

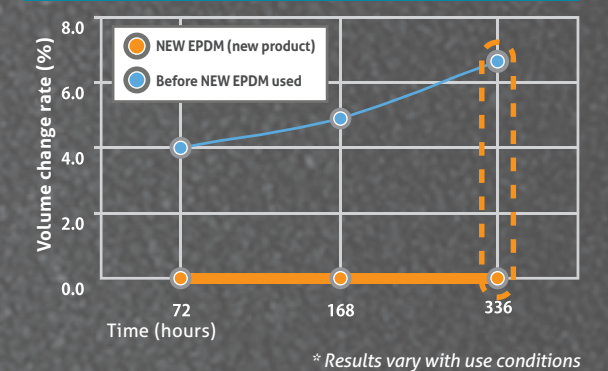
NEW EPDM

has dramatically enhanced endurance with regard to amines – which are solvents – compared with the conventional products. This enables stable operation over protracted periods and contributes to achieving maximal levels of energy-saving.

Due to the environmental problems of our age, the demand for CO2 capture systems is constantly on the rise. Such systems have CO2 absorbed by an "amine" absorbent liquid, then pass the liquid through a desorption tower to separate the CO2. If the systems can be operated so that heat is recovered efficiently and stably from the tower's bottom liquid and from the absorbent liquid that is passed into it, they can contribute to maximal levels of energy-saving.

As the graph below shows, the recently-developed NEW EPDM has a low percentage of volume change caused by the absorbent liquid and a high degree of resistance to chemicals, compared with conventional EPDM.

Comparison of volume change rates



Some applications where NEW EPDM is employed:

- For steam heaters in high-temperature regions where long service life is desired
- For heat exchangers used for caustic soda concentrating equipment in high-temperature regions.
- For heat exchangers in hot water applications (drains, sterile water, etc.) with 51X enhanced resistance to heat and chemicals.

The New EPDM breaks the conventional gaskets boundaries and lead into wider range of various applications.

TAKE THE OPPORTUNITY OF
MAINTENANCE TO GO FOR
HIGH PERFORMANCE!

Guide to our NEW EPDM “ALL-IN PACKAGE”

PROOF OF RELIABILITY

Performance enhancement with NEW
EPDM, plus “Freshening-up” with the
ALL-IN PACKAGE

FOUR-FOLD INCREASE
IN OVERHAULS IN
5 YEARS



Our maintenance
mascot “Arattaro”

The All-in Package is a service whereby we take away your plate type heat exchanger bodies and have our specialist staff overhaul them into a good-as-new condition before delivering them back to you. Since launching, this service has received large numbers of orders with an almost 100% repeat rate, and has been highly appraised by customers in a wide variety of industries. To use your plate type heat exchangers long into the future, leave their maintenance to us – the manufacturer.



Before All-in Package
Overhaul

...and AFTER

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EPDM09062014



NEW EPDM

SUPERIOR RESISTANCE TO HEAT & CHEMICALS

Raises the bar on heat/chemical resistance, expands
the potentials of plate type heat exchangers



*NEW EPDM can endure severe use environments – hence the image of a tough gasket in the picture.