Introducing EVAL Europe

Kuraray and EVAL Europe

Kuraray Co., Ltd. has long been a leader in high gas barrier technology and development. The company is the first and foremost producer of EVOH (ethylene vinyl-alcohol copolymer resins) under the name EVAL™ and the manufacturer of KURARISTER™.

The company was established in 1926 in Kurashiki, Japan for the industrial manufacture of chemical fibres. Since then, it has capitalised fully on its technological strengths in the fields of polymerisation and synthetics. Today, the Kuraray Group consists of about 70 companies, employing around 7,000 people worldwide.

Kuraray has been manufacturing and marketing ethylene vinyl-alcohol (EVOH) copolymer resins since 1972. Ever since, EVAL™ - the registered trademark for its EVOH resins - has grown into one of the company’s core businesses.

EVAL Europe nv was founded as a wholly owned subsidiary in Antwerp in 1997 to supply the European, Middle Eastern and African markets with EVAL™. EVAL Europe nv and its team of experts serves European customers from its Technical and Development Centre. The first EVOH production site in Europe doubled its production capacity in October 2004 to 24,000 tons per year.

Building on three decades of expertise in EVOH production, EVAL Europe remains the region’s leading EVOH manufacturer.

Unique technology from Kuraray

Kuraray, Co. Ltd. has developed leading high barrier technologies that are results of Kuraray’s pioneering research and development in this field.

EVAL™ resins are characterised by superior gas barrier properties and excellent coextrusion processability, while being recyclable. Technological innovation has led to an extended range of different grades of EVAL™ resins for food packaging, cosmetics, construction and building, automotive and industrial applications.

New EVAL™ SP grades are orientable and will take thermoforming, shrink and PET barrier applications even further. While preserving EVAL™’s typical high-barrier properties, they offer thermoforming windows that are much closer to those of PP and even PS for deep and unusual shapes. Furthermore, they allow improving barrier shrink properties by orienting further on tenter frame or double-bubble film. In addition they bring superior CO₂ and oxygen gas barrier to PET bottles with excellent delamination resistance.

EVAL™ EVOH is also available in film form for lamination when technical and demanding applications, such as all plastic and non-conducting balloons, are required.

KURARISTER™ is a new film with an amazing balance of properties for retort food packaging, KURARISTER™ takes the transparency, easy processing and easy printing of plastic films and adds high gas barrier and excellent retort resistance. The resulting lamination film offers a wide and useful range of properties that remain reliable, even during difficult processing, handling and retort treatments.
**Superior gas barrier properties**

EVAL™ resins have outstanding gas barrier properties. Without a gas barrier, oxygen may penetrate packaging and spoil the contents. EVAL™ keeps oxygen out and safeguards quality, making it especially suitable for food, medical, pharmaceutical, cosmetics, agricultural and industrial packaging applications.

**Flavour and aroma barrier**

While preventing oxygen and undesirable odours from sneaking into the package, the barrier properties of EVAL™ effectively maintain fragrances and lock the aromas in. This guarantees an extended shelf life for food and cosmetic products.

**Resistance to oil and organic solvents**

An EVAL™ layer offers very high resistance to hydrocarbons, oils and organic solvents. When EVAL™ is used in a multilayer structure, it prevents the evaporation of chemical substances. This property makes EVAL™ resins very suitable for use in applications involving chemicals, such as fuel tanks, chemical packaging and protective clothing.

**Good printability**

Packaging material containing EVAL™ resins can easily be printed with high-quality graphics without special treatment. This enhances the overall appearance of the product. Moreover, the printing loses nothing of its gloss or readability even after a long time.

**Excellent flex-crack resistance**

High-barrier structures containing an EVAL™ layer have an excellent flex-crack resistance. An EVAL™ layer makes sure that the integrity of the barrier remains unharmed during transport, handling and storage or even when the package is folded.

**Lustre and transparency**

The use of an EVAL™ layer in the outer surface of packaging material retains the original sparkle. As a result, the package will look attractive for an extended period of time.
Typical applications

- High-barrier laminate pouch/package
- Fresh red meat, fish, cheese
- High-barrier formable structures
- Fresh pasta, half-baked bread
- Pouch, bag-in-box, overwrap
- Juice, wine, sauces, tomato paste
- Safety gloves
- Building and construction film

Typical structure (in/out)

- PET/PE/tie/EVAL™/tie/EVA
- PET/PE/tie/EVAL™/tie/PE/PE
- PA/PE/tie/EVAL™/tie/PE
- PA/EVAL™/PA/tie/PE
- PA/EVAL™/PA/tie/lonomer
- PE/tie/PA/EVAL™/PA/tie/PE
- PE/tie/EVAL™/tie/PE
- PE/tie/EVAL™/tie/EVA
- PE/EVAL™/PE
**EVAL™ applied - Bottles**

<table>
<thead>
<tr>
<th>Typical applications</th>
<th>Typical structure (in/out)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketchup bottles, sauce bottles</td>
<td>PP/regrind/tie/EVAL™/tie/PP</td>
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<tr>
<td></td>
<td>PP/tie/EVAL™</td>
</tr>
<tr>
<td>Juice and milk bottles</td>
<td>PE/regrind/tie/EVAL™/tie/PE</td>
</tr>
<tr>
<td>Beer, carbonated beverages</td>
<td>PET/EVAL™/PET/EVAL™/PET</td>
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<tr>
<td></td>
<td>PET/EVAL™/PET</td>
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<tr>
<td>Chemical packaging bottles</td>
<td>EVAL™/tie/PE</td>
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<tr>
<td></td>
<td>EVAL™/tie/regrind/PE</td>
</tr>
<tr>
<td></td>
<td>PE/regrind/tie/EVAL™/tie/PE</td>
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Typical applications

- Retortable food trays, sauces
- Baby food, soup
- Prepared meals, sauces, dairy
- Deep draw, transparent, SPPF
- Beverage, fruit cup, meat trays

Typical structure (in/out)

- PP/regrind/tie/EVAL™/tie/PP
- PP/regrind/tie/EVAL™/tie/regrind/PP
- PS/regrind/tie/EVAL™/tie/regrind/PE
- PS/tie/EVAL™/tie/PS
- PS/tie/EVAL™/tie/PE
- PP/tie/EVAL™/tie/PP
## Typical applications

- Spice and cereal packages without an additional inner bag
- Wine, juice, dairy products, mineral water and edible oil
- Ketchup, mustard, sauces and tomato paste

## Typical structure (in/out)

| Spice and cereal packages without an additional inner bag | PE/paper/PA/tie/PE/PE/tie/EVAL™/tie/PE |
| Wine, juice, dairy products, mineral water and edible oil | PE/paper/PE/tie/EVAL™/tie/PE |
| Ketchup, mustard, sauces and tomato paste | Paper/PE/tie/EVAL™/tie/PE |
| | PE/tie/EVAL™/tie/PE |
Typical application | Typical structure (in/out)
---|---
Under-floor heating pipes | PEX/tie/EVAL™
Wall heating and cooling | PEX/tie/EVAL™/tie/PEX
Radiator heating pipe | PE-RT/tie/EVAL™
District heating pipe | PE-RT/tie/EVAL™/tie/PE-RT
Plumbing (sanitary) | PE-RT/tie/EVAL™/tie/PE-RT
Gas pipe | PB/tie/EVAL™/tie/PB
Open-air snow and ice-free heating | PP/tie/EVAL™
### Typical applications

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<td>Fuel tanks (automotive)</td>
<td>HDPE/tie/EVAL™/tie/regrind/HDPE + masterbatch</td>
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<tr>
<td>Small-engine gas tanks</td>
<td>PA6/EVAL™/PA6/tie/PA12</td>
</tr>
<tr>
<td>(lawn mower, chain saw, motor vehicles)</td>
<td>HDPE/tie/EVAL™/tie/Regrind/HDPE + masterbatch</td>
</tr>
<tr>
<td>Fuel lines</td>
<td>EVAL™/tie/HDPE</td>
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<tr>
<td>Fuel filler pipes</td>
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<tr>
<td>Underground fuel pipes</td>
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EVAL™ reduces waste

EVAL™ copolymer resins contribute to the reduction of industrial waste in the following ways:

• EVAL™ is fully recyclable and provides completely chlorine-free barrier solutions.
• Thanks to the superior barrier performances of EVAL™, a smaller amount of the raw material can be used for packaging or other applications containing an EVAL™ layer. As a result, the packaging will be lighter in weight and have less impact on the environment.
• Scrap from multilayer structures containing EVAL™ resins can be recycled.

Environmental protection

At EVAL Europe we strive to integrate environmental conservation into all levels of our business activities. We inherited this commitment from our parent company Kuraray Co. Ltd., which even back in 1983 had established the Kuraray Group Action Guidelines on the Global Environment.

Compliance with international environment regulations was the first step. We also consider it our responsibility to implement and promote new technologies to minimise the impact on the environment of all our corporate activities.

In every stage, from development, design to production, sales and service, we strive to prevent pollution, to utilise energy and resources more effectively and to ensure the reduction and responsible disposal of waste.

In addition to ISO 9001:2000, EVAL Europe nv is compliant with ISO 14001:2004, and ISO/TS16949.

Environmentally friendly packaging

EVAL™ EVOH is an environmentally friendly plastic. It contains no chlorine, dioxin, metals or endocrine disrupters. It can be recycled, either as part of a separate coextruded regrind layer or as post-consumer regrind. And it will not disrupt polyolefin or PET recycling streams and processes.

Even fully sustainable packaging only has value if it remains functional. EVAL™ EVOH adds real functionality to packaging, and helps lower environmental impact at several stages of the packaging lifecycle. The superior gas barrier properties of EVAL™ protect food quality and prolong freshness and shelf life, reducing waste and unnecessary transport, and allowing significant reduction in the required thickness of packaging structures.
EVAL™ around the world

EVAL Europe is part of the prestigious Kuraray Group, which has successfully established EVAL™ production facilities all over the world.

Asia Pacific
In Asia, Kuraray Co. Ltd. set up the world’s first EVOH production facility with a capacity of 10,000 tons a year.

USA
The United States of America is the home of the world’s largest EVOH production facility, with an impressive capacity of 35,000 tons a year.

Europe
EVAL Europe was Europe’s first EVOH production site, making EVAL™ resins since 1999. In 2004, EVAL Europe doubled its capacity to 24,000 tons per year, continuing our commitment to local supply as Europe’s largest EVOH production site.
EVAL™ the world’s leading EVOH

Europe
EVAL Europe nv (Antwerp, Belgium)
Capacity: 24,000 tons/year
Europe’s first and largest EVOH production facility

Americas
EVAL Company of America (Pasadena, Texas, USA)
Capacity: 35,000 tons/year
The world’s largest EVOH production facility

Asia-Pacific
Kuraray Co. Ltd. (Okayama, Japan)
Capacity: 10,000 tons/year
The world’s first EVOH production facility

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EVAL™ resins are produced worldwide under unified Kuraray product and quality specifications.

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