

***kuraray***

**SEPTON<sup>™</sup>**  
***HYBRAR<sup>™</sup>***



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**HYBRAR<sup>™</sup>**

**Kuraray's**  
**Thermoplastic Elastomers**

# Kuraray's Thermoplastic Elastomer Products SEPTON™ and HYBRAR™

*Kuraray manufactures innovative thermoplastic elastomers including SEPTON™ and HYBRAR™.*

## SEPTON™

SEPTON™ is a series of styrenic-based thermoplastic rubbers. Their block copolymer structure consists of styrene based hard-blocks and a hydrogenated polydiene soft block. These hydrogenated di-block and tri-block styrene copolymers exhibit rubber-like properties over a broad temperature range. Due to its thermoplastic properties SEPTON™ is recyclable.

In comparison to non-hydrogenated styrenic block copolymers, hydrogenated SEPTON™ exhibits better tensile strength, heat, weather, ozone resistance, and better compatibility with poly-olefins. Prior to processing, the polystyrene end blocks are associated in rigid domains and act as a physical crosslinking point below the glass transition temperature ( $T_g$ ) of polystyrene. In the presence of heat and shear during processing, the polystyrene domains soften and permit flow. After cooling, the polystyrene domains reform and harden locking the rubber network in place. This physical phenomenon provides SEPTON™ with its high tensile strength and elasticity ideal for rubberized molding applications, adhesives, sealants and polymer modification.

SEPTON™ can be used as a base polymer for rubber compounds, adhesives, sealants, coatings, wire or cable insulation and fibers for non-woven fabrics. Also, SEPTON™ can be utilized as a modifier and additive for applications such as plastic modifiers, compatibilizers, modification of thermosetting resins or shrinkage control for unsaturated polyester resins.



## SEPTON™ Grades


SEPTON™ is available in SEP, SEPS, SEEPS and SEBS polymers for customized applications.


Through continuous polymer innovation, specialized grades of SEPTON™ have been developed such as SEPTON™ J-series, SEPTON™ Q-series, and SEPTON™ V-series.

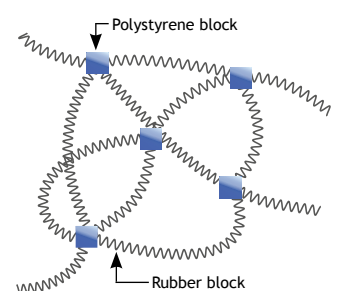
## Molecular Structure Model

Diblock: 

Triblock: 

 Polystyrene block (S) acts as a crosslinking point at the temperature below the glass transition temperature ( $T_g$ ) of polystyrene.

 The Rubber block (EP, EB, EEP) acts as an origin of rubber-like properties. Hydrogenation provides excellent heat resistance and weatherability.



HYBRAR™ is a truly unique triblock co-polymer having polystyrene end blocks and a vinyl rich poly-diene mid-block. Due to its peak tan delta near room temperature, HYBRAR™ exhibits exceptional vibration damping and shock absorption properties.

HYBRAR™ polymers are available as durable hydrogenated (7000 series) and non-hydrogenated (5000 series) grades. The hydrogenated HYBRAR™ grades show excellent miscibility with polypropylene resulting in improved transparency, clarity and flexibility when blended. Flexible films manufactured using HYBRAR™ are more environmentally friendly than PVC due to the absence of harmful plasticizers.

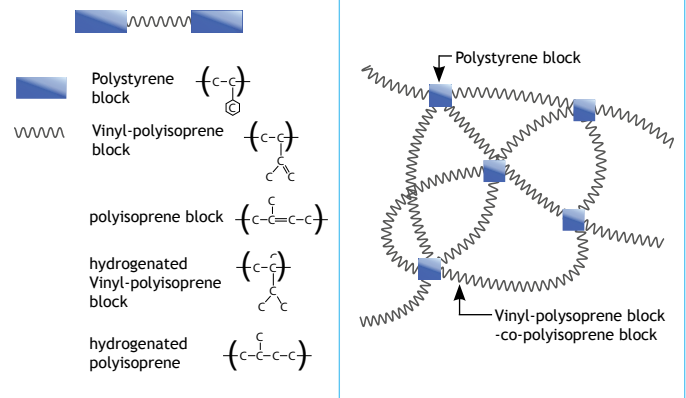
Enhanced damping properties make HYBRAR™ the product of choice for sports equipment as well as foamable sound damping sealants. Other applications include electronic components, film and tubing for medical packaging, adhesives, coatings, sealants, hearing protection, automotive, and housing and construction.

HYBRAR™ can be processed into a wide variety of forms, including films, tubes and injection molding.

## Characteristics

- Excellent vibration damping at room temperature
- High affinity to polyolefins and poly-styrene
- Good moldability
- Can be cross-linked like vulcanizable rubber
- Rubber like elasticity
- Hydrogenated grades provide excellent clarity when blended with polypropylene
- Very good heat and weather resistance
- Can be used in plasticizer free compounds

## Molecular Structure Model



## Automotive



### Characteristics

- Rubber-like elasticity
- Excellent long term compression set
- Curable (UV, E-Beam)
- Excellent tensile strength
- Low density
- High tear strength
- Heat resistant
- Vibration damping

### Applications

- Door weather strips
- Body-side and roof molding
- Interior soft-touch parts
- Hoses
- Airbag covers
- Bushings and gaskets
- Rack-and-pinion boots
- Wire and cable insulation
- Sound damping foam
- Dash board film
- Heat resistant adhesives
- Sealants
- Solvent less adhesives - No VOC's
- Lubricant additives

## Adhesives, Coatings, Sealants



### Characteristics

- Low temperature flexibility combined with high heat resistance
- Low melt viscosity and application temperature
- Superior adhesion to a variety of substrates and surface textures
- Good balance of tack, peel, and shear
- Color stable
- High clarity
- Spray-able (SEPTON™)

### Applications

- Tapes and label adhesives
- Cold seal food packaging
- Reactive adhesives
- Industrial and construction adhesives
- Exceptionally clear adhesives and sealants
- Automotive damping sealants
- Marine coatings
- Hot melt olefinic adhesive modifier
- Sound damping adhesives
- Excellent material for extrudable adhesives
- Low temperature hot melt adhesives

## Film and Packaging



### Characteristics

- Good softness and elasticity with lowest material concentration
- Dry blending in extrusion with no prior compounding step
- Reduced seal initial temperature of polypropylene (SIT)
- Maximum drop, impact and softness improvement
- Residue-free removal
- High clarity films
- Medical and food contact compliance
- Customizing tack adhesion for different surface appearances (e.g. embossed or non-embossed)

### Applications

- Premium elastic hygiene components
- Customized protective films
- Medical film
- Industrial packaging
- Stationery
- Food packaging
- Bottle cap liners
- Elastic films
- Quiet packaging

## Medical



### Characteristics

- Cost-effective solution for soft-touch applications
- Easily process-able
- High clarity
- Latex and PVC free

### Applications

- Replacement for natural rubber, latex, and PVC
- Catheter bags
- IV bags
- Medical films (HYBRAR™)
- Medical tubing (HYBRAR™)
- Orthopedic gels (SEPTON™)
- Patch adhesives (SEPTON™)
- Elastic nonwovens (SEPTON™)

## Application possibilities with SEPTON™

### SEPTON™ for Personal Care Products



#### Characteristics

- Soft touch and good haptics
- Increases strength and elasticity of nonwovens
- Food contact approval on many grades
- Low stress relaxation and permanent set
- Withstands high-speed converting
- Latex and PVC free

#### Applications

- Baby diapers
- Adult incontinence products
- Feminine care products
- Nonwovens
- Elastic films
- Soft rubber overmolding

### SEPTON™ in Gel Applications



#### Characteristics

- Easy mixing and handling
- Excellent clarity
- Excellent compatibility with mineral oils
- Food contact approval on many grades
- Can be made into products ranging from rubbery gel to thixotropic grease
- Can be made tacky or non-tacky
- Can be cross-linked to give thermoset gels

#### Applications

- Cable filling for copper and fiber optic cables
- Air fresheners
- Candles
- Gel padding
- Ergonomic floor mats
- Cosmetics
- Orthopedic gels

## HYBRAR™ for Vibration & Sound Damping

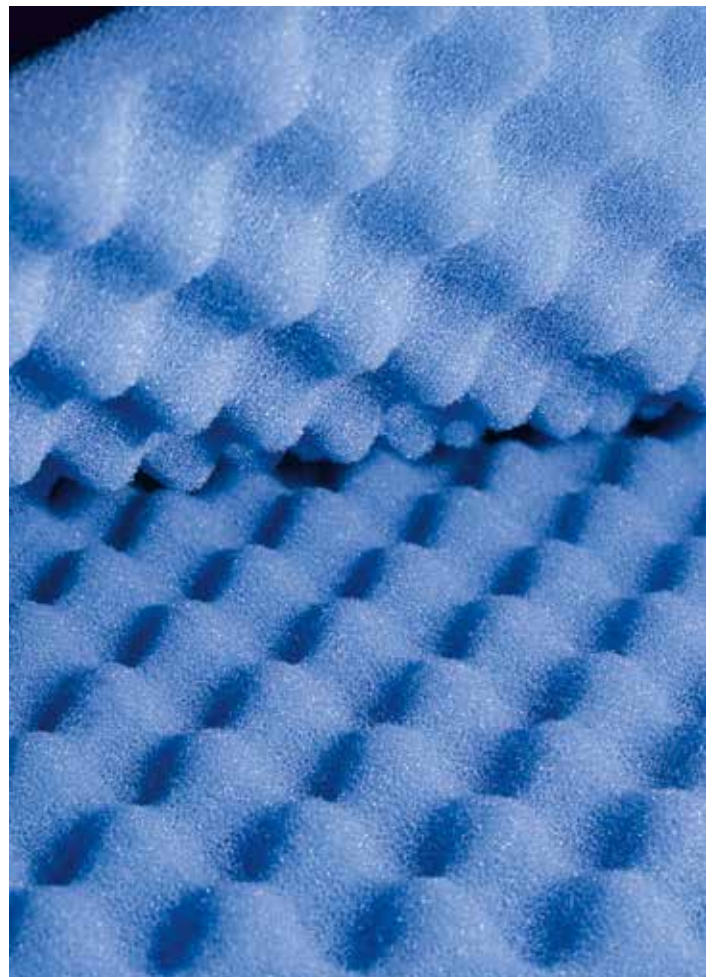


## Characteristics

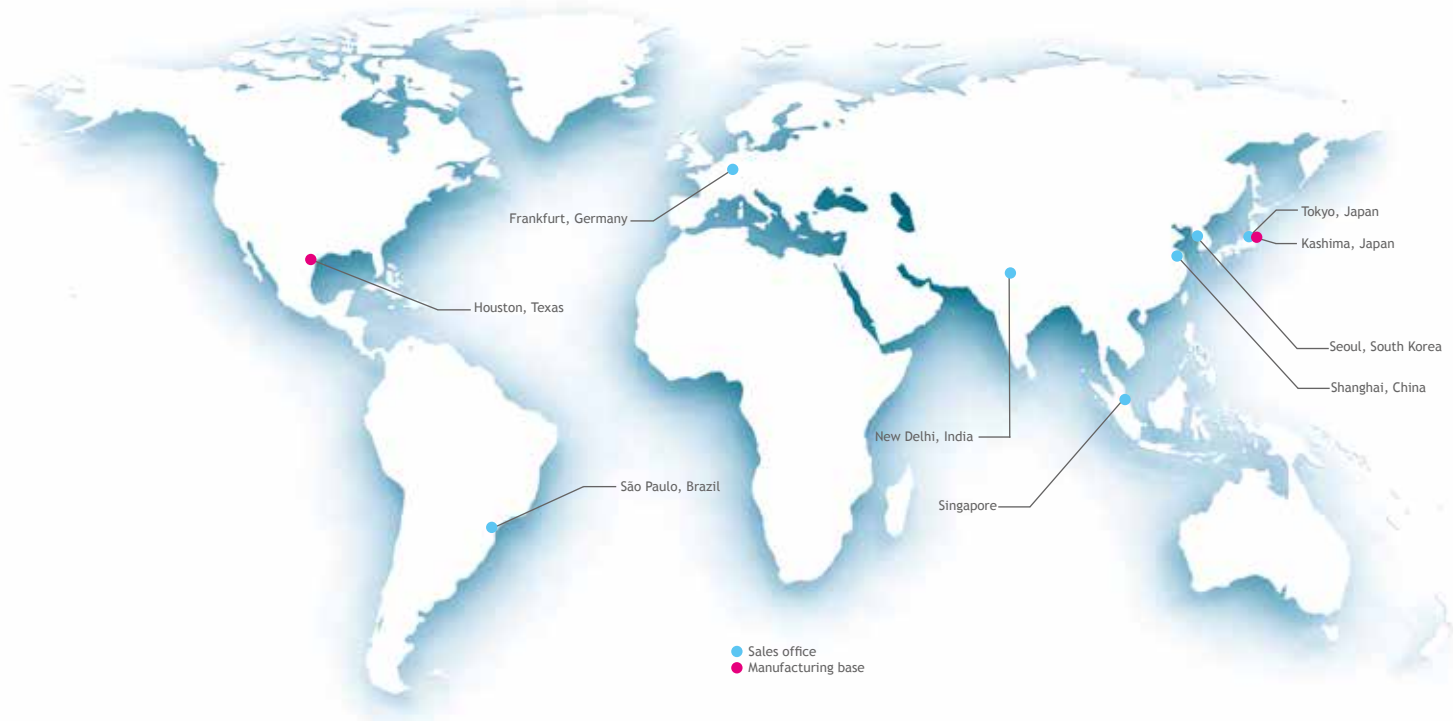
- Vibration damping due to its vinyl rich mid-block
- Easily processed
- Moldable, extrudable and foamable
- High clarity when blended with polypropylene
- Functional across a wide temperature range

## Applications

- Sporting equipment and tool grips
- Sealants and padding in construction
- Automotive foams and sealant
- Expandable, sound damping foam
- Adhesives with sound and vibration damping properties



## Adding value to your products - worldwide



SEPTON™, HYBRAR™ and KURARITY™ are Kuraray's trademarks for thermoplastic elastomers (TPEs). They are a special type of synthetic rubber that combine the elastic properties of rubber with the benefits of thermoplastics. They can be processed into almost any shape. TPEs have a pleasantly soft touch and good wear comfort. They also increase shock absorption. What's more, they are recyclable. Kuraray's TPEs are environmentally sound, free of PVC and do not need additional plasticizers. They are used for an extremely wide range of applications including many plastic compounds for every-

day products. Examples include toys, toothbrushes, medical tubes, sports equipment, sealants and car tires. The flexible types are used as lubricant additives and base components in adhesives. Kuraray is a leading supplier of TPEs and offers customers more than 30 different grades with individual properties.

For further information, please contact your local Kuraray office or visit our website.

 [www.elastomer.kuraray.com](http://www.elastomer.kuraray.com)

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Disclaimer: Precautions should be taken in handling and storage. Please refer to the appropriate Safety Data Sheet for further safety information. In using SEPTON™ and HYBRAR™, please confirm related laws and regulations, and examine its safety and suitability for the application. For medical, health care and food contact applications, please contact your Kuraray representative for specific recommendations. SEPTON™ and HYBRAR™ should not be used in any devices or materials intended for implantation in the human body. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement.