



TRINSEO™

# Customized TPE Solutions for Automotive

**MEGOL™ TPS-SEBS  
Compounds**  
High performance  
soft touch

**APIGO™ TPO Compounds**  
Lightness, elasticity,  
and superior at low  
temperatures

**TIVILON™ TPV Compounds**  
Excellent compression set

**APILON™ 52 TPU  
Polymers and Compounds**  
Excellent mechanical  
properties, chemical  
and abrasion resistance

**APIZERO™ EVA-based  
Compounds**  
A light and versatile  
alternative to other  
foamed solutions

# Meet the challenges of future mobility

Trinseo's customized TPE Solutions and EVA-based compounds for automotive applications

Trinseo is a leading global partner for the automotive industry. Our rigid and soft-touch plastics are optimized for lightweight construction, enabling low VOC levels, best-in-class scratch and heat resistance, long-term durability, high design flexibility, excellent haptics and high-end aesthetics.

Car manufacturers and suppliers trust our broad variety of innovative materials for automotive applications, particularly for a functional and aesthetic interior experience. Spread over 25 countries, our nearly 2,700 employees at 17 manufacturing sites and 11 research and development facilities around the world are ready to quickly respond to our customer's needs.

With the acquisition of API Applicazioni Plastiche Industriali S.p.A. in 2017, Trinseo became your one-stop partner for both rigid and soft-touch polymers to support your development and manufacturing of future-oriented automotive applications.

You can benefit from our expertise in customizing our products focused on specific needs. We invite you to learn more about our Thermosets and TPE solutions for interior and exterior automotive applications.



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# Customized Thermoplastic Elastomers and EVA-based compounds

Properties and advantages to meet increased consumer needs



## Shorter cycle time

→ Shorter processing time compared to rubber



## Optimized appearance

→ Colorability in all color shades, wide gloss range, and suitable for different graining



## Recyclability

→ Scrap can be recycled



## Bio-based

→ Alternative grades based on renewable resources are available for specific applications



## Design flexibility

→ Suitable for co-injection and co-extrusion with other substrates for multi-component parts



## Durability

- Good resistance in the range -40°C to +125°C
- Excellent aging resistance: heat, UV, ozone, weather
- Long term dimensional stability due to good compression set and tensile strength



## Weight reduction

- Low specific gravity
- Lower weight than thermoset rubber

# MEGOL™

## TPS-SEBS Compounds

### High performance soft touch haptic

The MEGOL™ family of TPE compounds offers the ideal combination of the elasticity and look and feel of rubber with the low processing costs of thermoplastics. Typically based on SEBS, the MEGOL™ range offers optimum cold and hot elasticity, UV and age resistance, low emissions and low fogging as well as a large processing window.

Grades for overmolding and co-extrusion with technopolymers (PP, PE, ABS, SAN, PPMA, PC, PET, PA6, PA66, TPU, POM, etc).

MEGOL™ provides great looking, excellent soft-touch properties, and a good compression set.

#### TYPICAL CHARACTERISTICS:

- Remarkable range of hardness (5 ShA–60 ShD) and elastic modulus
- Excellent resistance to ageing (UV, ozone and weathering)
- Almost white base color allows very wide color range
- Excellent performance at low temperatures (Tg = -50°C)
- High temperature resistance (120°C)
- Chemical resistance to acids, detergents, bases and aqueous solutions

#### SPECIFIC GRADES HAVE SPECIAL CHARACTERISTICS:

- High temperature resistance and low compression set (MEGOL™ HT)
- Suitable for co-molding and co-extrusion (MEGOL™ SV) for hard/soft compositions, also to non-polyolefinic substrates to which conventional MEGOL™ is compatible
- Calendaring grades (MEGOL™ TA)
- Types for automotive interior with low emissions and high scratch resistance

# MEGOL™ Main features and processing basics

## TRANSFORMATION PROCESS

MEGOL™ products can be transformed by molding using conventional machinery for injection and extrusion. For process parameters see the adjoining illustrations.

## SPECIAL PROCESS

Not required.

## COLORING

MEGOL™ compounds are available in a natural base color, and we can supply specific masterbatches for MEGOL™. It is important that the masterbatch used is suitable for the single grade and the end application regarding properties such as UV resistance, processing temperatures, etc. We can also produce MEGOL™ in customized colors mixed according to customer specifications.

## PRE-DRYING

MEGOL™ compounds are not hygroscopic and do not require pre-drying for processing. For some special hygroscopic grades, we recommend 1.5 to 2 hours at 75°C to 80°C.

## RECYCLING

Reground material can be mixed with virgin compound.

## PACKAGING

MEGOL™ products are supplied in 25 kg polyethylene bags on standard 1,250 kg pallets. Octabin packaging is also available upon request.

## STORAGE

MEGOL™ should be stored in cool, dry, well-ventilated conditions, away from heat sources and open flames. Although not hygroscopic, exposure to humidity should be avoided.

## SHRINKAGE

Post-mold shrinkage of MEGOL™ is dependent on various factors: the polymer is non-isotropic, therefore shrinkage is greater depending on the line of flow. The position of the injection point will thus have a great influence. Also, factors such as cooling time, injection speed and pressure, the shape and thickness of the product will contribute to the final value. Typical shrinkage of a plate 110 x 60 x 3 mm may vary, according to grade, from 0.7–1.2% (filled compound); 1.0–2.2 % (very soft, unfilled compound).

## TECHNICAL ASSISTANCE

Our technical assistance department is at your disposal to support you with all the necessary information on how to transform MEGOL™ correctly and help you to choose the best MEGOL™ type to suit your specific needs.

## PROCESSING

### Injection molding

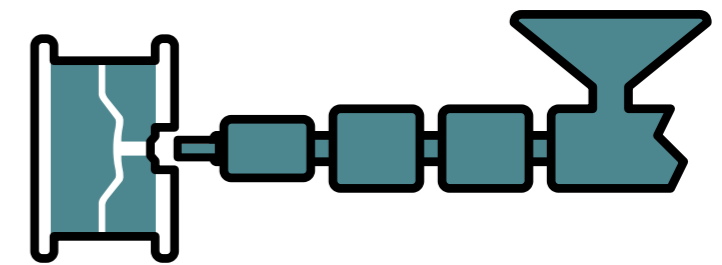
Conventional type with general purpose screw

Injection pressure **Medium**

Back pressure **Low–Medium**

Injection speed **Medium–Fast**

Temperature °C  
**Soft**  
**Rigid**



35	190	185	180	170
65	220	210	200	190

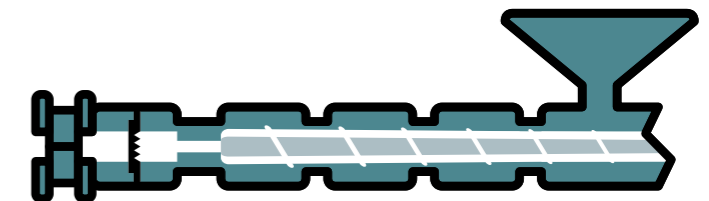
### Extrusion

Single screw, general purpose

L/D ratio **>20**

Compression ratio **1:2.5**

Temperature °C  
**Soft**  
**Rigid**

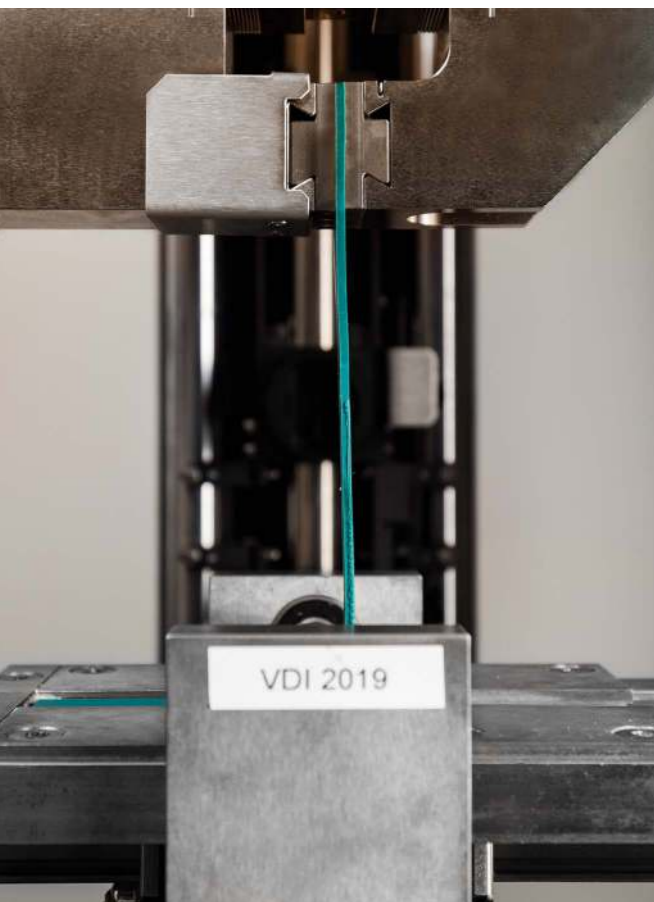


190	180	175	170	160
210	210	190	190	180

The processing details shown above are intended only as a guide. Actual conditions will vary considerably from machine to machine and will very much depend on the moldings or extrusion being produced.

# MEGOL™ AM – Adhesion modified TPE for overmolding

The overmolding of rigid plastics with soft TPEs delivers genuine advantages in the functional, visual, acoustic and tactile properties of a plastic application.



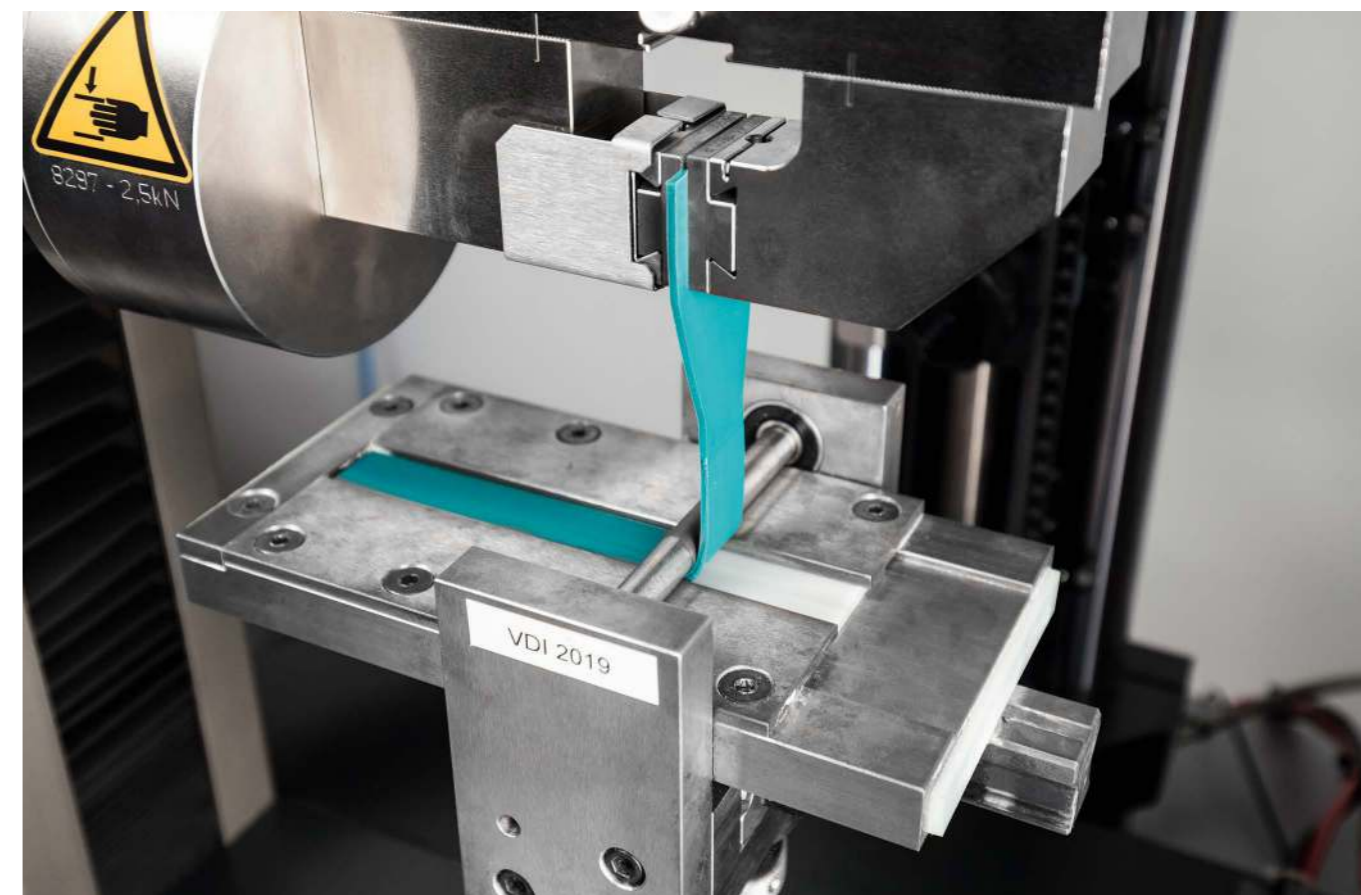
As in other markets, there is an increased demand in the automotive business for plastics that enable a premium surface appearance and excellent haptics available in a wide range of colors. We therefore expanded the MEGOL™ and the APILON™ 52 products families to produce grades suitable for overmolding on polar polymers (ABS, PC, PC/ABS, ASA, PMMA, TPU), polyamides (PA6, PA66, PA12), and polyester-based techno-polymers (PBT, PET) as well as for glass fiber reinforced grades.

Overmolding technology allows for the creation of composite finished products in a single step, removing the need for successive gluing or mechanical fixing phases. This additionally reduces the environmental impact as there are no VOC emissions from adhesives and because the components are not made from a range of incompatible materials, their recycling after a useful life is much easier. The development of this technology enables the overmolding process to be extended to highly technical applications such as complex components for the automotive industry.



The vast range of products for overmolding such as MEGOL™ AM (Adhesion Modified) or APILON™ 52 developed by API, now a Trinseo company, means that we can satisfy the most diverse requirements for both surface appearance (finish, opacity, shine, color and transparency) and haptics (softness, rubberlike feel). Another unique aspect is their ease of processability with the type of technopolymer they are to be molded to.

We are also working on developing of control systems and certification protocols for gauging bond strength in over-molding. We were part of an international work group (coordinated by VDI in Germany) tasked with redefining the standards and norms governing this field of application.



# APIGO™ TPO Compounds

Lightness, elasticity, and superior  
at low temperatures



APIGO™ products were created to meet market demands for light products that are highly resistant to low temperatures. We have continually improved the APIGO™ grades, which have been very successful over the years and are excellent alternatives to flexible PVC wherever halogen-free materials are required.

APIGO™ materials are polyolefin-based compounds modified with elastomers. We developed these products to meet the market requirements for alloys with rigidity lower than conventional polypropylene but with customized characteristics for specific applications.

#### TYPICAL CHARACTERISTICS:

- Large range of hardnesses (30 ShA–60 ShD) and elastic modulus
- Excellent performance at low temperatures
- Chemical resistance to acids and bases
- Co-molding to polyolefinic substrates
- Extrusion and injection molding transformation

# APIGO™ Main features and processing basics

## TRANSFORMATION PROCESS

APIGO™ products can be transformed by molding using conventional machinery for injection and extrusion. See the adjacent graphics for process parameters.

## SPECIAL PROCESS

APIGO™ products can be co-molded onto polyolefin or onto themselves with excellent adhesion results.

## COLORING

APIGO™ is supplied as neutral pellets and can be colored later using masterbatches. For the coloring of APIGO™, we recommend the use of specific masterbatches from the APICOLOR™ PE series. We can also produce APIGO™ in customized colors mixed according to customer specifications.

## PRE-DRYING

APIGO™ compounds are not hygroscopic and do not require pre-drying for processing.

## RECYCLING

Reground material can be mixed with virgin compound.

## PACKAGING

APIGO™ products are available in 25 kg bags and 1,250 kg pallets. Octabin packaging is also available upon request.

## STORAGE

We recommend storing APIGO™ in a cool, dry and well-ventilated place. Exposing the product to high temperatures, open flames or any other heat source should be avoided. APIGO™ is not sensitive to humidity.

## SHRINKAGE

Post-mold shrinkage of APIGO™ is dependent on various factors: the polymer is non-isotropic, therefore shrinkage is greater depending on the line of flow. The position of the injection point will thus have a great influence. Also, factors such as cooling time, injection speed and pressure, the shape and thickness of the product will contribute to the final value. Typical shrinkage of a plate 110 x 60 x 3 mm may vary, according to grade, from 0.5% to 1,5%.

## TECHNICAL ASSISTANCE

Our technical assistance department is at your disposal to support you with all the necessary information on how to transform APIGO™ correctly and help you to choose the best APIGO™ type to suit your specific needs.

## PROCESSING

### Injection molding

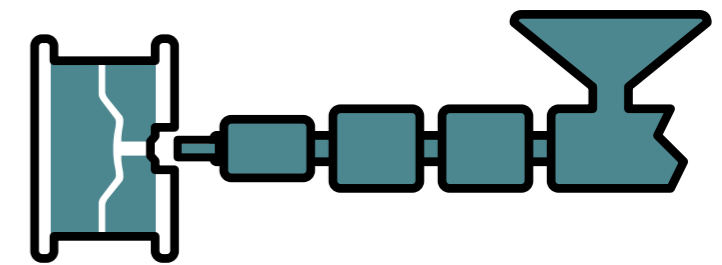
Conventional type with general purpose screw

Injection pressure **High**

Back pressure **Medium**

Injection speed **Medium-Low**

Temperature °C **Soft**  
**Rigid**



20 ÷ 40	180	170	160	150
40 ÷ 60	200	190	180	170

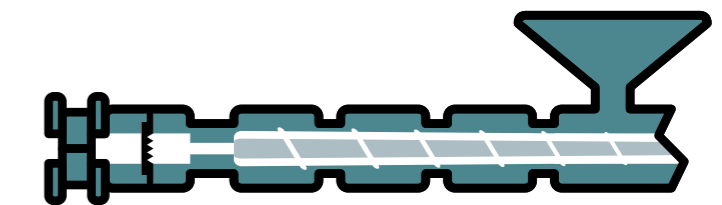
### Extrusion

Single screw, general purpose

L/D ratio **>20**

Compression ratio **1:2.5-3**

Temperature °C **Soft**  
**Rigid**



180	180	170	160	150
200	190	190	190	180

The processing details shown above are intended only as a guide. Actual conditions will vary considerably from machine to machine and will very much depend on the moldings or extrusion being produced.



# TIVILON™

## TPV Compounds

### Excellent compression set

TIVILON™ is a family of TPE products based on dynamically Vulcanized Thermoplastic Elastomers (TPVs). It provides high elasticity at low and high temperatures, excellent compression set, UV resistance and high melt flow.

TIVILON™ is particularly well-suited to bonding with other materials for co-molding and co-extrusion with polyolefins and their compounds. The improved processability of the TIVILON™ range means that it is easier to transform both for molding and extrusion as compared to traditional TPV products. The creation of customized grades highlights other impressive features of this product such as its resistance to scratches and solvents, its performance when exposed to fire, its increased thermo-resistance and the ability to produce it in a wide range of colors.

#### TYPICAL CHARACTERISTICS:

- Large range of hardnesses (30 ShA-60 ShD)
- High temperature resistance
- Excellent compression set
- Chemical resistance to acids and bases
- Oil resistance better than MEGOL™ and APIGO™
- Co-molding to polyolefinic substrates
- Extrusion and injection molding transformation

# TIVILON™ Main features and processing basics

## TRANSFORMATION PROCESS

TIVILON™ products can be transformed by molding using conventional machinery for injection and extrusion. See the adjacent graphics for process parameters.

## SPECIAL PROCESS

TIVILON™ products can be co-molded onto polyolefin or onto themselves with excellent adhesion results.

## COLORING

TIVILON™ compounds are available in a natural base color, and we can supply specific masterbatches for TIVILON™. It is important that the masterbatch used be suitable for the specific grade and end application regarding properties such as UV resistance, processing temperatures, etc. We can also produce TIVILON™ in customized colors mixed according to customer specifications.

## PRE-DRYING

TIVILON™ compounds are hygroscopic. We recommend 1.5 to 2 hours at 75°C to 80°C.

## RECYCLING

Reground material can be mixed with virgin compound.

## PACKAGING

TIVILON™ products are supplied in 25 kg aluminum bags on standard 1,250 kg pallets. Octabin packaging is also available upon request.

## STORAGE

TIVILON™ should be stored in cool, dry, well-ventilated conditions, away from heat sources and open flames.

## SHRINKAGE

The post-mold shrinkage of TIVILON™ depends on various factors. The polymer is non-isotropic, therefore shrinkage is greater depending on the line of flow. The position of the injection point will thus have a great influence. Also, factors such as cooling time, injection speed and pressure, the shape and thickness of the product will contribute to the final value. Typical shrinkage of a plate 110 x 60 x 3 mm may vary, according to grade, from 0,7–1,2% (filled compound); 1,0–2,2% (very soft, unfilled compound).

## TECHNICAL ASSISTANCE

Our technical assistance department is at your disposal to support you with all the necessary information on how to transform TIVILON™ correctly and help you to choose the best TIVILON™ type to suit your specific needs.

## PROCESSING

### Injection molding

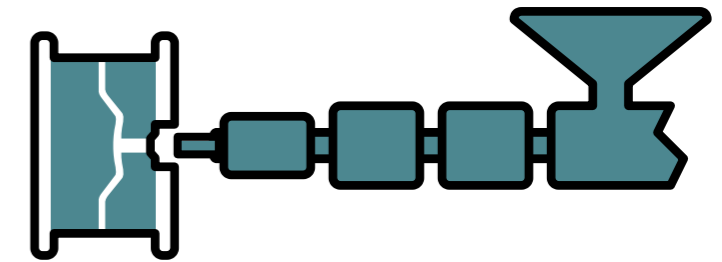
Conventional type with general purpose screw

Injection pressure **Medium**

Back pressure **Low–Medium**

Injection speed **Medium–Fast**

Temperature °C **Soft**  
**Rigid**



35	190	185	180	170
50	210	200	190	180

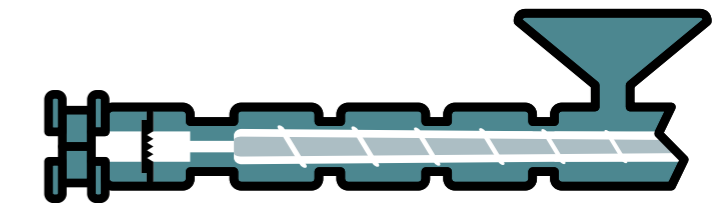
### Extrusion

Single screw, general purpose

L/D ratio **>20**

Compression ratio **1:2.5**

Temperature °C **Soft**  
**Rigid**



190	180	175	170	160
200	190	185	180	170

The processing details shown above are intended only as a guide. Actual conditions will vary considerably from machine to machine and will very much depend on the moldings or extrusion being produced.

# APILON™ 52

## TPU Polymers and Compounds

### Excellent mechanical properties, chemical, and abrasion resistance



APILON™ 52 is a line of thermoplastic polyurethanes with excellent mechanical properties, high elasticity and superior resistance to low temperatures. They are very durable and suitable for applications where a high level of resistance to abrasion, oils and fats is necessary and can be customized to suit specific application requirements.

APILON™ 52 is divided into polyester-based and polyether-based series with a scale of hardnesses from 40 Shore A to 75 Shore D and are available in a range of formulations based on the performance required. The range includes:

- Plasticized APILON™ 52 – with optimum flexibility even at low temperatures, medium-low range of hardnesses and easy processability.
- Modified APILON™ 52 – as polymeric alloys of soft materials ideal for co- and overmolding or extrusion, where a rubberier haptic and grippy surface is required while maintaining the high mechanical performance.
- Special APILON™ 52 is a customized formula with properties designed to meet the needs of specific applications (e.g. increased resistance to hydrolysis, microbes and aging).
- Bio-based grades, both ether and ester, with the same mechanical properties and durability of traditional grades, and a high content of renewable resources (up to 70%)

Automotive customers can use APILON™ 52 products for applications such as scratch-resistant interior surfaces, gaskets, abrasion-resistant tubes and cables, bellows, impact protections, etc. Modified APILON™ 52 grades (because of their optimum bonding properties with various structural techno-polymers) are used as the soft component in items that are constructed from a combination of materials with different hardnesses. They fit wherever the desired effect is to combine the superior durability of TPU with the appearance and haptics of rubber.

#### TYPICAL CHARACTERISTICS:

- Large range of hardnesses (30 ShA–60 ShD)
- High temperature resistance
- Good compression set
- Chemical resistance to acids and bases
- Better oil resistance as compared to MEGOL™ and APIGO™
- Co-molding to polyolefinic substrates
- Extrusion and injection molding transformation
- Excellent abrasion resistance

# APILON™ 52 Main features and processing basics

## TRANSFORMATION PROCESS

APILON™ 52 products can be transformed with all known technology used for plastic materials.

## SPECIAL PROCESS

Post-curing of the parts at 80°C to 110°C for 15 to 20 hours in an oven allows the product to reach optimum mechanical characteristics even faster. APILON™ 52 products can be glued with the help of special adhesives.

## COLORING

APILON™ 52 are supplied as natural pellets and can be colored later using masterbatches. For the coloring of APILON™ 52, APICOLOR™ MASTERBATCHES are already available in a very wide variety of tones, shades, and special effects like metallized, pearlescent, or photoluminescent. APICOLOR™ MASTERBATCHES can be based both on ester and ether APILON™ 52, using a carrier identical or a very similar to the APILON™ 52 type that needs to be colored, which optimizes homogenization.

## PRE-DRYING

Being hygroscopic, the APILON™ 52 humidity rate must be kept lower than 0.05% in order not to cause problems during transformation. It is always advisable to pre-dry APILON™ 52 as follows: 2 hours at 80°C to 100°C for softer types; 2 hours at 90°C to 120°C for harder types. See the adjacent graphics for process parameters.

## RECYCLING

APILON™ 52 products are thermoplastic technopolymers and therefore totally recyclable. We recommend reusing the reground material in a blend with the virgin material and to pre-dry it before reuse.

## PACKAGING

APILON™ 52 products are normally supplied in 25 kg aluminum bags on standard 1,250 kg pallets.

## STORAGE

We recommend storing the products in a cool, dry and ventilated place. Exposure to high temperatures, humidity, open flames or any other heat source should be avoided. The product is hygroscopic. Should the original packaging be opened, an adequate drying treatment is required.

## SHRINKAGE

Post-mold shrinkage of APILON 52™ is dependent on various factors: the polymer is non-isotropic, therefore shrinkage is greater depending on the line of flow. The position of the injection point will thus have a great influence. Also, factors such as cooling time, injection speed and pressure, the shape and thickness of the product will contribute to the final value. Typical shrinkage of a plate 110 x 60 x 3 mm may vary, according to grade, from 0,2% to 2%.

## TECHNICAL ASSISTANCE

Our technical assistance department is at your disposal to support you with all the necessary information on how to transform APILON™ 52 correctly and help you to choose the best APILON™ 52 type to suit your specific needs

## PROCESSING

### Injection molding

Conventional type with general purpose screw

Injection pressure	<b>500 ÷ 1000 bar</b>
Back pressure	<b>Medium-Low</b>
Locking pressure	<b>High</b>
Injection speed	<b>Medium-Low</b>

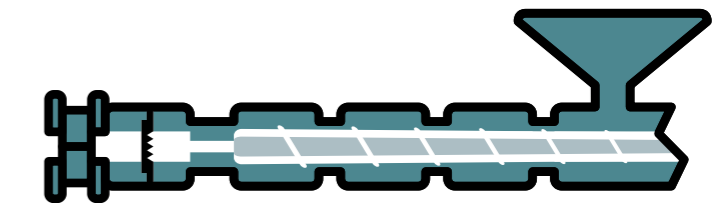
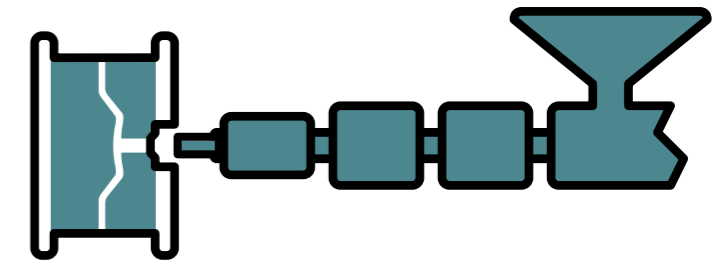
Temperature °C	<b>Min</b>	Mold	<b>200</b>	<b>190</b>	<b>185</b>	<b>180</b>
	<b>Max</b>	<b>30 ÷ 60°C</b>	<b>230</b>	<b>215</b>	<b>200</b>	<b>190</b>

### Extrusion

Single screw, general purpose

L/D ratio	<b>20-30</b>
Compression ratio	<b>1:2.5-3</b>

Temperature °C	<b>Min</b>	<b>170</b>	<b>180</b>	<b>175</b>	<b>170</b>	<b>160</b>
	<b>Max</b>	<b>210</b>	<b>220</b>	<b>210</b>	<b>200</b>	<b>185</b>

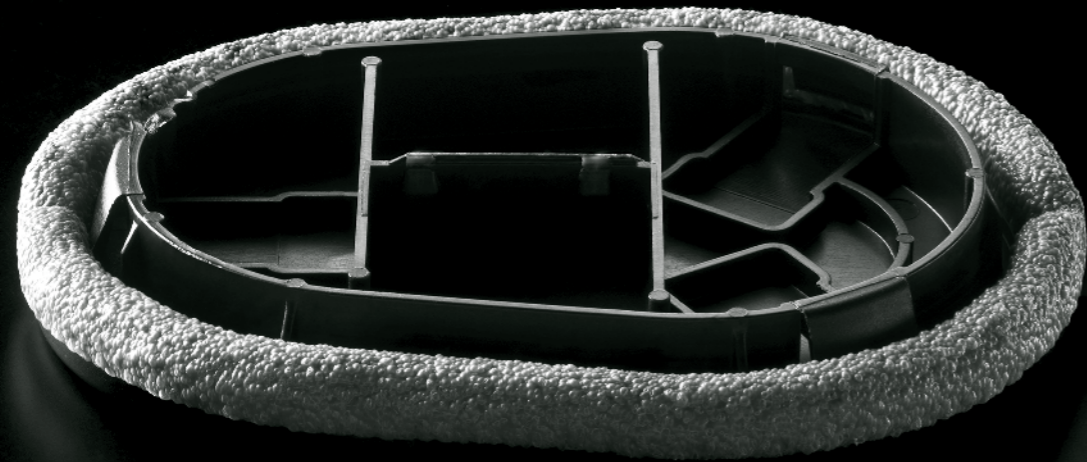


The processing details shown above are intended only as a guide. Actual conditions will vary considerably from machine to machine and will very much depend on the moldings or extrusion being produced.

# APIZERO™

## EVA-based, crosslinkable, and expandable TPE compounds

### A light and resistant alternative for PVC



Our APIZERO™ products are crosslinkable and expandable products based on EVA (ethyl-vinyl acetate) for injection molding. We developed APIZERO™ to meet the market needs for materials to produce light and sustainable applications. APIZERO™ products can successfully compete with conventional products such as two-component polyurethane.

Some typical applications in the automotive field are expandable plugs and acoustic insulation in the chassis.

#### TYPICAL CHARACTERISTICS:

- Lightweight
- Abrasion resistance
- Resistance to high and low temperatures
- Excellent aesthetic qualities
- Suitable for injection molding

# APIZERO™ Main features and processing basics

## TRANSFORMATION PROCESS

The injection process is similar to that used for conventional thermoplastic materials: the material is injected into molds thermo-regulated at 180°C where, after about 5 or 6 minutes, the cross-linking takes place. As soon as the mold is opened, based on the type of material used, the volume of the piece can expand up to five times the volume of the original mold. This expansion is completely homogenous across all three dimensions and gives a linear increase of up to 1.8 times. A wide variety of molding machines are available on the market that, when used with accurately constructed molds, will enable the production of any shape while maintaining high levels of productivity. The molding process of APIZERO™ is shown, with its operating conditions, in the adjoining illustrations.

## SPECIAL PROCESS

With special APIZERO™ types designed for automotive plugs and insulation components, the material can be injected in the mold with a molten mass temperature of approximately 90°C to 105°C, and parts can be extracted from the mold without any expansion taking place: expansion can then be activated later in an environment with a temperature varying from approximately 120°C to 200°C. Exact conditions depend significantly, in such cases, from the specific customer's equipment and process.

## COLORING

APIZERO™ compounds are available in natural base color. We can also produce APIZERO™ in customized colors mixed according to the customer's specifications.

## PRE-DRYING

Not required.

## RECYCLING

After cross-linking, APIZERO™ materials can no longer be recycled.

## PACKAGING

APIZERO™ products are supplied in 25 kg polyethylene bags on standard 1250 kg pallets.

## STORAGE

We recommend storing the products in a cool, dry and ventilated place. Exposure to high temperatures, humidity, open flames or any other heat source should be avoided. The product is hygroscopic. Should the original packaging be opened, an adequate drying treatment is required.

## TECHNICAL ASSISTANCE

Our technical assistance department is at your disposal to give you all the necessary information on how to transform APIZERO™ correctly and help you to choose the best APIZERO™ type to suit your specific needs.

## SAFETY

While in its pellet form, APIZERO™ presents no risks of toxicity either by contact or inhalation. During the processing stage, however, contact with the product and inhalation of the fumes should be avoided. We advise proper ventilation of the areas where processing takes place. For further information, please refer to our material safety sheets.

## PROCESSING

### Injection molding

Conventional type with general purpose screw

Injection speed **6-15g/sec**

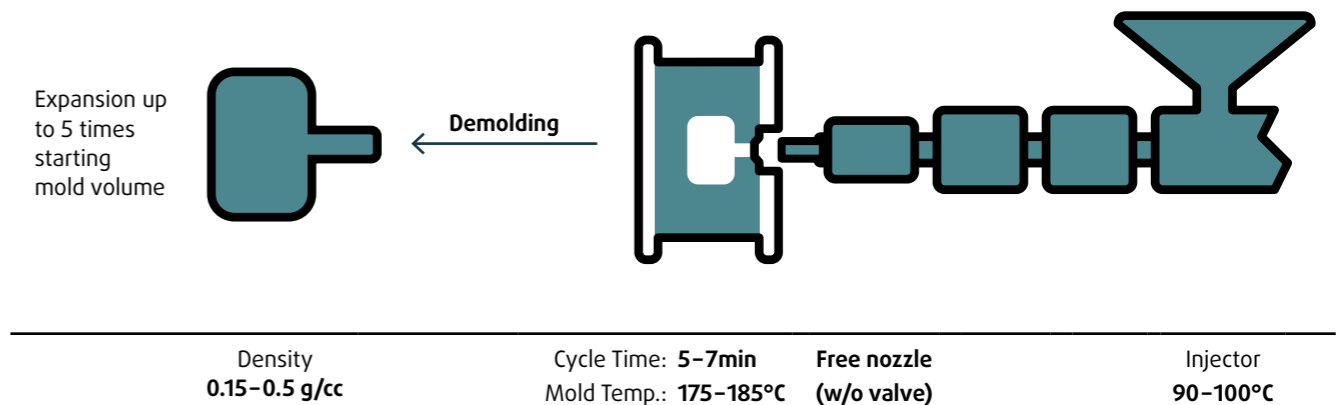
Injection pressure **80 ÷ 100 bar**

Back pressure **0 ÷ 20 bar**

Screw length **L/D = 18/20**

Molten Mass Temp. **90-105°C**

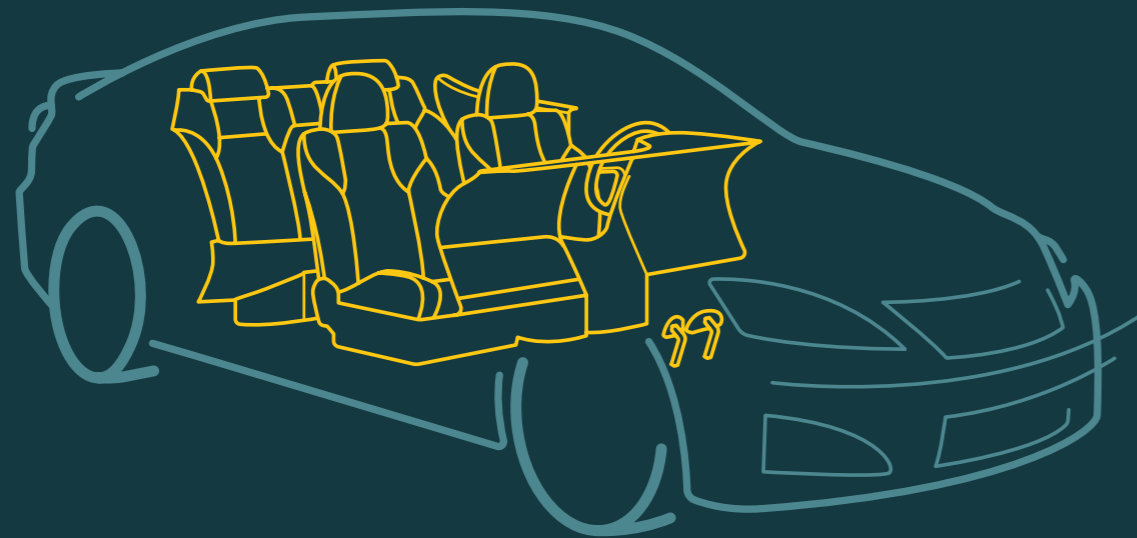
*Mold in aluminum*



The processing details shown above are intended only as a guide. Actual conditions will vary considerably from machine to machine and will very much depend on the moldings being produced.

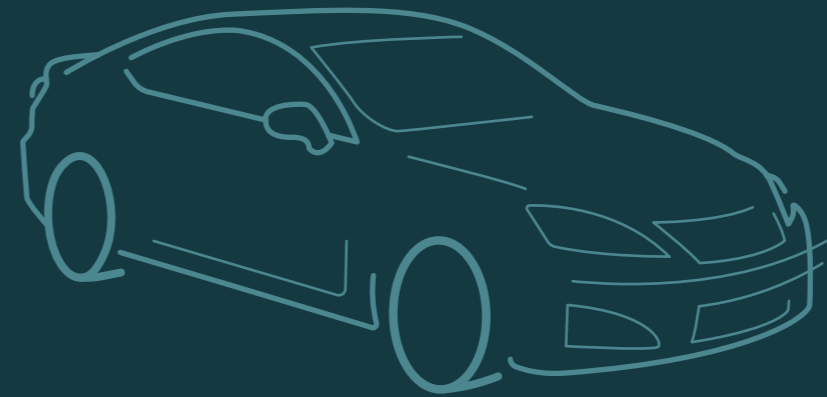
# Technical specifications

Ecological, lightweight, and energy efficient solutions for all automotive construction areas.



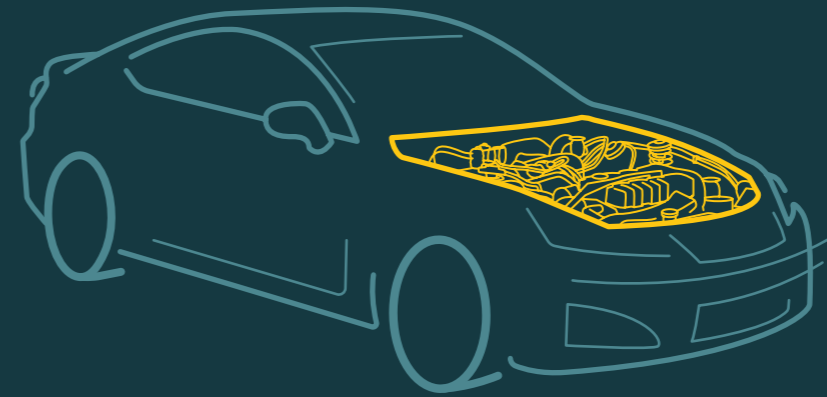
## Vehicle interior

Dark and light colors, easy dyeing, low emissions, low odor, high UV resistance, high scratch resistance, and vibration damping for applications in automotive interior parts that can be processed by conventional thermoplastic equipment for injection and extrusion. Soft/hard combinations allow lower-weight solutions while maintaining optimized haptic and stiffness. Special grades are available for sensitive applications in safety systems.



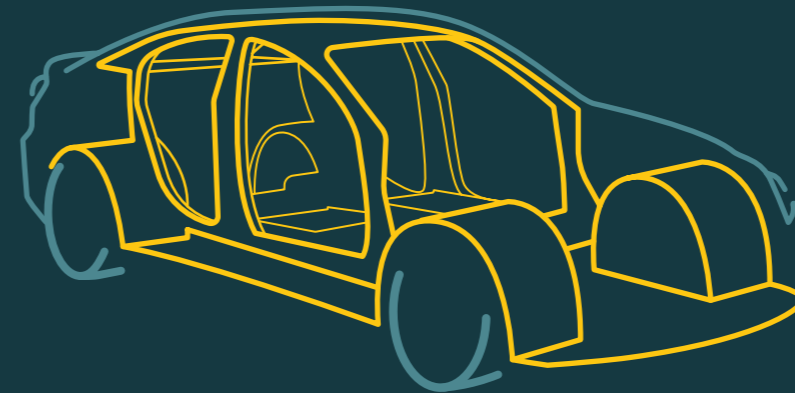
## Vehicle exterior

Weather-resistant grades with high impact and scratch resistance, which are widely applied in the automotive exterior, for roof and glass sealing applications as well as for applications below the belt line like mud flaps, wheel arches, side bars. They are suitable both for injection and for extrusion processing.



## Under the hood

Heat- and oil-resistant grades with excellent compression set and elasticity are used under the hood for seals, dampers, boots, air ducts, air baffles, tubes and hoses, fasteners, and others. They are suitable for injection and blow molding, and for extrusion processing.



## Chassis

Excellent sealing behavior, paint indifference and aging resistance for both foamed and compact solutions in car body plugs and assembly pins. Waterproof qualities and long-term hydrolysis resistance are the features of the grades used in water channeling and cable protection applications. They are suitable for injection, extrusion, and specific processing technologies.

# Products for automotive interiors

Low emissions, low odor, UV resistance, scratch resistance, vibration damping.

## Interior

MATERIAL CLASS	MATERIAL CODE	APPLICATION	OEM	ABRASION DIN 53516 [mm <sup>3</sup> ]	ELONGATION AT BREAK (TYPE IVB) ASTM D638 [%]	DENSITY ASTM D792 [g/cc]	FLEXURAL MODULUS ASTM D790-P.08L [MPa]	IMPACT RESISTANCE (-35°C) ASTM D256 [J/m]	TEAR STRENGTH (TYPE C) ASTM D624 [kN/m]	MELT FLOW INDEX 190°C/ 230°C 21.18N ASTM D1238 [g/10 sec]	HARDNESS SH.A (15 sec) ASTM D2240 [ShA]	HARDNESS SH.D (3 sec) ASTM D2240 [ShD]	TENSILE STRENGTH (TYPE IVB) ASTM D638 [MPa]	
Grade														
APILON™ 52 MA-8505 NEUTRO	TPU	351AS944000	Seat cable cover non visible	-	<80	>700	1.21-1.25	-	-	>70	<15	81-85	-	>30
TIVILON™ D 50 DR 1EX BLACK	TPV	071AN004000	Sliding roof profiles	VARIOUS	-	450-600	0.91-0.95	-	-	95-145	1-5	-	47-53	18-28
TIVILON™ DP2622/45UVR BLACK	TPV	071BN331000	Sliding roof profiles	VARIOUS	-	-	-	-	-	-	-	-	-	-
TIVILON™ DP2622/75UVR BLACK	TPV	071BN199000	Sliding roof profiles	VARIOUS	-	300-1000	0.94-1.00	-	-	35-45	-	70-80	-	5.6-10
APIFLEX™ S 77-03 NERO	PVC	101GN013000	Brake and clutch pedal	FORD, VOLVO, FCA	-	>370	1.18-1.22	-	-	45-55	10-25	75-79	-	>12
APIGO™ DP0728UVR NERO D034	TPE-O	204BN018000	Air bag cover	PEUGEOT	-	400-600	0.87-0.91	100-190	150-200	75-105	1-2,6	-	38-46	9-16
APIGO™ DP1478UV ANTRACITE F013	TPE-O	204BE009000	Air bag cover	OPEL	-	477-753	0.88-0.90	190-280	No break	62-86	4,2-7,6	-	41-47	10-16
APIGO™ DP1478UV BEIGE J039	TPE-O	204BM005000	Air bag cover	OPEL	-	477-753	0.88-0.90	190-280	No break	62-86	4,2-7,6	-	41-47	10-16
APIGO™ DP2476 NERO	TPE-O	204BN098000	Air bag cover	VARIOUS	-	500-750	0.88-0.90	260-340	No break	-	5,2-9,2	-	43-47	10-15
APIGO™ DP2476 NEUTRO	TPE-O	204BS183000	Air bag cover	VARIOUS	-	500-750	0.88-0.90	260-340	No break	-	5,2-9,2	-	43-47	10-15
APIGO™ DP2476 SHI NATURAL	TPE-O	204BS197000	Air bag cover	VARIOUS	-	550-800	0.87-0.90	160-240	No break	-	4-8	-	35-39	9-14
MEGOL™ DP0691/55UVR ANTRACITE F396	TPE-SEBS	031VE052000	Thumb wheels	VOLVO	-	>600	0.98-1.02	-	-	20-40	5-55	50-60	-	>5
MEGOL™ DP0691/65UVR NERO C328	TPE-SEBS	031VN110000	Thumb wheels	DAIMLER	-	>500	0.99-1.03	-	-	30-40	<25	60-70	-	>7
MEGOL™ DP2154/27 NERO	TPE-SEBS	031VN201000	Gear knob (under leather)	CHRYSLER	-	600-900	1.18-1.22	-	-	10-16	8-24	25-35	-	1.8-2.8
MEGOL™ DP2758/47UVR NEUTRO	TPE-SEBS	031AS952000	Safety belt bellow	DAIMLER	-	550-750	0.89-0.93	-	-	22-30	4-13	44-52	-	7-11.5
MEGOL™ EX 65 SV/P NEUTRO	TPE-SEBS	031VS183000	Soft touch on ABS sheet	-	-	>470	1.03-1.07	-	-	33-45	2-20	60-70	-	>10
MEGOL™ HT1 55 SV/P/UVR NERO J103	TPE-SEBS	031VN302000	Cup holder	VW	-	>550	0.97-1.01	-	-	31-39	10-20	55-61	-	>4
MEGOL™ I A 50 SV/P ANTRACITE A422	TPE-SEBS	031VE010000	Thumb wheels	FORD, VOLVO	-	>450	1.00-1.04	-	-	29-39	-	45-55	-	5-15
MEGOL™ I A 50 SV/P NERO	TPE-SEBS	031VN012000	Thumb wheels	FORD, VOLVO	-	>450	1.00-1.04	-	-	29-39	-	45-55	-	5-15
MEGOL™ I A 55 SV/PUVR NERO	TPE-SEBS	031VN129000	A-Pillar gaskets	RENAULT TRUCKS	-	>500	1.02-1.06	-	-	30-40	10-60	50-60	-	>12.5
MG DP0691/65-UVR NERO C328	TPE-SEBS	031VN174000	Thumb wheels	DAIMLER	-	>500	0.99-1.03	-	-	30-40	<25	60-70	-	>7
TIVILON™ F 75 DE 1 NERO	TPV	071BN201000	Safety belt component	RENAULT	-	>650	0.95-0.99	-	-	>27	20-50	70-80	-	>5

Interior

MATERIAL CLASS	MATERIAL CODE	APPLICATION	OEM	ABRASION DIN 53516 [mm <sup>3</sup> ]	ELONGATION AT BREAK (TYPE IVB) ASTM D638 [%]	DENSITY ASTM D792 [g/cc]	FLEXURAL MODULUS ASTM D790-P.08L [MPa]	IMPACT RESISTANCE (-35°C) ASTM D256 [J/m]	TEAR STRENGTH (TYPE C) ASTM D624 [kN/m]	MELT FLOW INDEX 190°C/ 230°C 21.18N ASTM D1238 [g/10 sec]	HARDNESS SH.A (15 sec) ASTM D2240 [ShA]	HARDNESS SH.D (3 sec) ASTM D2240 [ShD]	TENSILE STRENGTH (TYPE IVB) ASTM D638 [MPa]	
Grade														
TIVILON™ M 70 DE 4 NERO	TPV	071BN040000	Airbag O-ring sealing	VARIOUS	-	>600	1.05-1.09	-	-	28-38	3-13	67-73	-	>6.5
TIVILON™ M 75 DR 1 NERO	TPV	071BN166000	Sealing rail / belt line molding	DAIMLER	-	300-1000	0.94-1.00	-	-	35-45	-	70-80	-	5.6-10
MEGOL™ I A 57 E UG BEIGE F566	TPE-SEBS	031DM033000	Handles interior	FCA	-	>550	1.18-1.22	-	-	17-21	150-250	52-62	-	>3
MEGOL™ I A 70 E UG NERO E986	TPE-SEBS	031DN079000	Door component	-	-	>450	1.16-1.20	-	-	20-26	>100	65-75	-	>3.5
MEGOL™ DP2586/60SVPA/UVR NERO	TPE-SEBS	031VN327000	Handles on PA	PSA	-	300-600	1.17-1.23	-	-	17-27	<6	55-65	-	3-6
TIVILON™ DP0359/95 NERO	TPV	071BN206000	Interior component	-	-	400-700	1.03-1.07	-	-	34-48	20-60	90-96	-	5-8
TIVILON™ M 55 LR 0 NERO K670	TPV	071BN364000	Interior door handle	FORD	-	500-800	0.88-0.92	-	-	19-28	4-20	50-60	-	4-8
TIVILON™ M 55 LR 0 NEUTRO	TPV	071BS833000	Interior door handle	FORD	-	500-800	0.88-0.92	-	-	19-28	4-20	50-60	-	4-8
APIFLEX™ S 80-08 NERO	PVC	101HN023000	Pedal covers	FCA	-	>290	1.21-1.25	-	-	>58	4-14	78-82	-	>15
APIFLEX™ F 70-08/16 ANTRACITE 7957NL	PVC	102FE092000	Hand brake bellow cover	FCA, FORD	-	>310	1.27-1.29	-	-	36-44	85-125	68-72	-	>8
APIFLEX™ F 70-08/21 ANTRACITE 6955NL/E	PVC	102FE157000	Hand brake bellow cover	FCA	-	>300	1.29-1.31	-	-	35-43	85-125	68-72	-	>8
APIFLEX™ DP2843/70/30 GRIGIO K348	PVC	102FE158000	Bus arm rests	-	-	>400	1.30-1.34	-	-	>38	30-60	67-73	-	>11
APIFLEX™ S 70-08/50 NERO	PVC	102FN096000	Interior bellow covers	FCA	-	330-470	1.33-1.37	-	-	35-45	30-70	67-73	-	9-13
APIFLEX™ DP2843/70/30 NERO	PVC	102FN132000	Bus arm rests	-	-	>400	1.30-1.34	-	-	>38	30-60	67-73	-	>11
MEGOL™ I A 70 P UG/FLUVR/S4 NERO L554	TPE-SEBS	031AN098000	Handles	OPEL	-	600-900	0.87-0.91	-	-	29-39	40-120	65-75	-	8-14
MEGOL™ I A 70 P UG NERO	TPE-SEBS	031AN011501	Inlay mats	MAN	-	>700	0.88-0.90	-	-	31-41	10-30	65-75	-	>10
MEGOL™ DP2758/47UVR NERO M048	TPE-SEBS	031AN103000	Safety belt bellow	DAIMLER	-	550-750	0.89-0.93	-	-	22-30	4-13	44-52	-	7-11.5
MEGOL™ DP2758/47UVR ANTRACITE M069	TPE-SEBS	031AE072000	Safety belt nellow	DAIMLER	-	550-750	0.89-0.93	-	-	22-30	4-13	44-52	-	7-11.5
MEGOL™ DP1741/70SVPA/UVR NATURAL	TPE-SEBS	031VS555000	Side panel molding	HYUNDAI	-	>400	1.09-1.13	-	-	>27	-	65-75	-	>5
MEGOL™ DP2154/27 NATURAL	TPE-SEBS	031VS295000	Gear knob (under leather)	CHRYSLER	-	600-900	1.18-1.22	-	-	10-16	8-24	25-35	-	1.8-2.8
MEGOL™ DP0691/55UVR NATURAL	TPE-SEBS	031VS206000	Thumb wheels	DAIMLER	-	>600	<1.01	-	-	<55	-	50-55	-	>6.2
MEGOL™ DP0691/65UVR NATURAL	TPE-SEBS	031VS227000	Thumb wheels	DAIMLER	-	500-650	0.99-1.03	-	-	30-40	<25	60-70	-	7-9.3
MEGOL™ DP0691/55UVR ANTRACITE F396	TPE-SEBS	031VE052503	Thumb wheels	DAIMLER	-	>600	0.98-1.02	-	-	20-40	5-55	50-60	-	>5
MEGOL™ DP0691/65UVR NERO D243	TPE-SEBS	031VN109503	Thumb wheels	DAIMLER	-	>500	0.99-1.03	-	-	30-40	<25	60-70	-	>7
MEGOL™ DP0691/65UVR NERO C328	TPE-SEBS	031VN110503	Thumb wheels	DAIMLER	-	>500	0.99-1.03	-	-	30-40	<25	60-70	-	>7
MEGOL™ DP0691/65UVR BEIGE K328	TPE-SEBS	031VM019503	Thumb wheels	DAIMLER	-	>600	0.98-1.02	-	-	20-40	5-55	50-60	-	>5
MEGOL™ DP1838/10/1 NATURAL	TPE-SEBS	031VS360000	Speaker gasket	PSA	-	>800	0.90-0.94	-	-	>10	>200	5-15	-	>2
MEGOL™ DP1838/20 NATURAL	TPE-SEBS	031VS249503	Speaker gasket	PSA	-	>650	0.92-0.96	-	-	>10	>200	15-25	-	>2.6

# Products for automotive exteriors

Performance at temperature, durability, abrasion and scratch resistance, weathering resistance, high impact resistance.

## Exterior

MATERIAL CLASS	MATERIAL CODE	APPLICATION	OEM	ABRASION DIN 53516 [mm <sup>3</sup> ]	ELONGATION AT BREAK (TYPE IVB) ASTM D638 [%]	DENSITY ASTM D792 [g/cc]	FLEXURAL MODULUS ASTM D790-P.08L [MPa]	IMPACT RESISTANCE (-35°C) ASTM D256 [J/m]	TEAR STRENGTH (TYPE C) ASTM D624 [kN/m]	MELT FLOW INDEX 190°C/ 230°C 21.18N ASTM D1238 [g/10 sec]	HARDNESS SH.A (15 sec) ASTM D2240 [ShA]	HARDNESS SH.D (3 sec) ASTM D2240 [ShD]	TENSILE STRENGTH (TYPE IVB) ASTM D638 [MPa]	
Grade														
APIGO™ E/350 ANTRACITE MET. E592	TPE-O	204JZ001000	Mud flaps and front spoilers	NISSAN	-	>500	0.89-0.91	320-380	87	98-118	-	-	50-56	>14
APIGO™ E/350 NERO C497	TPE-O	204JN002000	Mud flaps and front spoilers	NISSAN	-	>500	0.89-0.91	320-380	87	98-118	-	-	50-56	>14
APILON™ 52 D-40L NEUTRO	TPU	351AS235000	Rear curtain electric gasket	-	<50	>500	1.20-1.23	-	-	-	-	86-92	36-42	>28
MEGOL™ A 90 C UG/FL2UVR NERO	TPE-SEBS	031BN250000	Windshield lower panel	BMW	-	300-900	1.14-1.16	-	-	25-40	120-200	85-95	-	5-10
MEGOL™ DP2334/70FL/1 UVR1 NERO I640	TPE-SEBS	031VN322000	Quarter glass sealing	HYUNDAI	-	>400	1.05-1.09	-	-	40-60	35-65	65-75	-	>10
MEGOL™ DP2722/140 UVI ANTRACITE K429	TPE-SEBS	031BE184000	Mud flaps	FORD	-	400-800	1.09-1.13	120-130	-	43-55	30-70	90-96	33-39	7.5-10.5
MEGOL™ DP2722/140 UVI NERO	TPE-SEBS	031BN347000	Wheel arches	FORD	-	400-800	1.09-1.13	120-130	-	43-55	30-70	90-96	33-39	7.5-10.5
MEGOL™ DP2576/FL/MD1 NERO	TPE-SEBS	031VN367000	Rear axle sensor	VW	-	500-900	1.01-1.05	-	-	30-50	-	70-76	-	5-7
TIVILON™ M 50 DI 2 NERO	TPV	071BN188000	Exterior gaskets	-	-	-	-	-	-	-	-	-	-	-
APIGO™ 9121NL/70 NERO	TPE-O	209BN001000	Truck side rear light frame	-	-	>490	1.02-1.06	-	-	20-28	90-150	68-72	-	>3.5
APILON™ 52 6011 NERO	TPU	361SN008000	Entry panel	-	<100	>550	1.00-1.04	-	-	30-40	10-30	57-63	-	>9
APILON™ 52 6011 NEUTRO	TPU	361SS013000	Entry panel	-	<100	>550	1.00-1.04	-	-	30-40	10-30	57-63	-	>9
MEGOL™ A 70 C1/FLUVR NERO L554	TPE-SEBS	031BN395000	General purpose	OPEL	-	650-1000	0.96-1.00	-	-	25-45	60-120	65-75	-	8-15
MEGOL™ DP2722/85 BLACK	TPE-SEBS	031BN309000	Wheel arches	AVTOVAZ	-	>600	1.16-1.20	-	-	28-36	40-80	80-90	-	>5
TIVILON™ F 80YDR 2 BLACK	TPV	071BN349000	Windshield exterior sealing	VOLVO	-	400-700	0.97-1.01	-	-	>20	>10	75-85	-	>6
APILON™ 52 ETC 40 NATURAL UV	TPU	351GS002000	Windshield wiper cover	MAN	-	>600	1.11-1.15	-	-	>90	8-25	83-89	39-42	>35
APILON™ 52 DP2998/60 BLACK	TPU	361SN115000	Door entry panel	AUDI	-	>500	1.01-1.03	-	-	28-38	10-20	57-63	-	>5
APILON™ 52 8013/UV BLACK	TPU	361SN084000	Door entry panel	AUDI	<100	>500	1.06-1.10	-	-	>47	15-60	77-83	-	>13

# Products for vehicle chassis

Sealing behavior, aging resistance, paint indifference, waterproof qualities, hydrolysis resistance.

## Chassis

	MATERIAL CLASS	MATERIAL CODE	APPLICATION	OEM	ABRASION DIN 53516 [mm <sup>3</sup> ]	ELONGATION AT BREAK (TYPE IVB) ASTM D638 [%]	DENSITY ASTM D792 [g/cc]	FLEXURAL MODULUS ASTM D790-P.08L [MPa]	IMPACT RESISTANCE (-35°C) ASTM D256 [J/m]	TEAR STRENGTH (TYPE C) ASTM D624 [kN/m]	MELT FLOW INDEX 190°C/ 230°C 21.18N ASTM D1238 [g/10 sec]	HARDNESS SH.A (15 sec) ASTM D2240 [ShA]	HARDNESS SH.D (3 sec) ASTM D2240 [ShD]	TENSILE STRENGTH (TYPE IVB) ASTM D638 [MPa]
Grade														
APIZERO™ DP1695 NEUTRO	EVA Crosslinked	252BS228000	Plugs	VARIOUS	-	>190	0.18-0.24	-	-	-	-	27-33	-	>1
APIZERO™ DP1695/16 NEUTRO	EVA Crosslinked	252BS461000	Plugs	VARIOUS	-	>400	0.18-0.26	-	-	-	-	30-36	-	>1,4
MEGOL™ I A 60 C UG NEUTRO	TPE-SEBS	031BS002000	General purpose	OPEL, GM	-	700-980	1.17-1.21	-	-	22-30	5-30	55-65	-	5.5-8.5
MEGOL™ I A 50 E UG/LS GRIGIO 8520	TPE-SEBS	031DE100000	Cable holder	-	-	400-800	1.17-1.21	-	-	12-20	-	45-55	-	2-4
MEGOL™ I A 70 E UG NEUTRO	TPE-SEBS	031DS011000	Chassis components	-	-	>450	1.16-1.20	-	-	20-26	>100	65-75	-	>3,5
MEGOL™ DP0579 NERO	TPE-SEBS	031FN052000	Body plugs	VARIOUS	-	>680	1.25-1.29	-	-	30-40	>7	62-72	-	5.5-7.5
MEGOL™ DP2217/70PBT NERO	TPE-SEBS	031VN233000	Cable connector on PBT	-	-	>500	0.98-1.02	-	-	>30	>5	65-75	-	>5.5
TIVILON™ M 80 DE 2 NERO	TPV	071BN030000	Chassis components	-	-	700-1000	0.94-1.02	-	-	35-60	1-9	75-85	-	8-14
TIVILON™ D 40 DE 1 NERO	TPV	071BN054000	Door water drainage	DAIMLER	-	500-800	0.91-0.95	-	-	65-100	<10	-	35-45	10-20
TIVILON™ F 43 DE 6 NERO	TPV	071BN081000	Grommets	-	-	>620	1.14-1.18	-	-	>12	10-40	38-48	-	>3.6
TIVILON™ M 36 DE 4 NERO	TPV	071BN317000	Cable holder	TOYOTA	-	300-600	1.05-1.09	-	-	8-14	5-25	33-39	-	2-3.6
APIGO™ DP0349/73 NERO	TPE-O	203DN010000	Air buffles	FCA	-	>450	1.16-1.20	-	-	20-26	>80	70-76	-	>3.5
MEGOL™ DP1411 BLACK	TPE-SEBS	031DS144000	Pressure Release Valve (PRV)	HONDA	-	>250	1.16-1.20	-	-	>8	200-0	45-55	-	>1,4
MEGOL™ DP0512/50 BLACK	TPE-SEBS	034BN127000	General purpose	OPEL, GM	-	>700	1.16-1.20	-	-	15-45	<6	45-55	-	>5
API L™ 55 NEUTRO	TPE-E	51A55GV1000	Grommets	-	-	600-800	1.17-1.21	140-170	-	>110	-	-	52-58	>25
MEGOL™ 9697NL/40M BLACK	TPE-SEBS	031VN060501	Jack lifting	BMW	-	>320	1.10-1.14	-	-	9-15	40-80	35-45	-	>1.5
MEGOL™ 9207NL/65 BLACK	TPE-SEBS	034BN066000	Rear water draining pipe	VW-SKODA	-	>750	0.86-0.90	-	-	30-45	2-6	60-70	-	>8
MEGOL™ I A1 50 S AT NERO	TPE-SEBS	031BN069000	Bellow tow bar	DAIMLER	-	>730	0.98-1.02	-	-	17-23	>90	45-55	-	>5.5
MEGOL™ I A1 50 S AT NERO D243	TPE-SEBS	031BN151000	Bellow tow bar	DAIMLER	-	>730	0.98-1.02	-	-	17-23	>90	45-55	-	>5.5

# Products for under the hood applications

Heat and oil resistance, excellent compression set and high elasticity.

## Under the hood

MATERIAL CLASS	MATERIAL CODE	APPLICATION	OEM	ABRASION DIN 53516 [mm <sup>3</sup> ]	ELONGATION AT BREAK (TYPE IVB) ASTM D638 [%]	DENSITY ASTM D792 [g/cc]	FLEXURAL MODULUS ASTM D790-P.08L [MPa]	IMPACT RESISTANCE (-35°C) ASTM D256 [J/m]	TEAR STRENGTH (TYPE C) ASTM D624 [kN/m]	MELT FLOW INDEX 190°C/ 230°C 21.18N ASTM D1238 [g/10 sec]	HARDNESS SH.A (15 sec) ASTM D2240 [ShA]	HARDNESS SH.D (3 sec) ASTM D2240 [ShD]	TENSILE STRENGTH (TYPE IVB) ASTM D638 [MPa]	
Grade														
MEGOL™ A 70 C1/FL NERO	TPE-SEBS	031BN262000	Air duct sealing	BMW	-	650-1000	0.96-1.00	-	-	25-45	60-120	65-75	-	8-15
MEGOL™ A 90 C1/FL NERO	TPE-SEBS	031BN282502	Air duct sealing	VW	-	600-1000	0.96-1.00	-	-	45-65	30-100	85-95	-	9-16
TIVILON™ M 30 DE 4 NERO	TPV	071BN094000	Air venting valve	TOYOTA	-	>250	1.06-1.11	-	-	>8	5-25	27-35	-	>1.5
TIVILON™ M 45 DE 4 NERO	TPV	071BN093000	Air venting valve	TOYOTA	-	500-800	1.07-1.12	-	-	12-22	2-7	40-48	-	3-5
MEGOL™ I A1 45 S AT NEUTRO	TPE-SEBS	031BS168000	Air duct sealing	-	-	>800	0.98-1.02	-	-	16-22	>80	40-50	-	>6
MEGOL™ I A 60 E UG NERO	TPE-SEBS	031DN009000	Air buffles	FCA	-	>550	1.18-1.22	-	-	17-23	90-200	55-65	-	>3
TIVILON™ F 65 DE 4 NERO	TPV	071BN045000	Under the hood	-	-	>600	1.03-1.07	-	-	>20	10-40	60-70	-	>4
TIVILON™ DP2826-FV NERO	TPV	071BN221000	Under the hood	-	-	>400	0.97-1.01	-	-	>25	<2	78-82	-	>5.7
APILON™ 52 D-45L NEUTRO	TPU	351AS287000	Engine temporary caps	-	-	>550	1.19-1.23	-	-	>100	-	-	41-46	>28
MEGOL™ DP2722/1/91X NERO	TPE-SEBS	031BN355000	Air duct sealing	BMW	-	200-600	1.13-1.17	-	-	-	26-50	85-95	-	8-15
MEGOL™ AUTO A87 2 A001/FL NERO	TPE-S	031BN462501	Air guide	VW	-	600-1000	0.96-1.00	-	-	45-65	30-100	84-90	-	11-16

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**Product Stewardship**

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