

General information and recommendations :

Coval suction cups are made in different elastomer materials with hardness: 35shA, 50shA and 60shA (not all range are available with these materials).

Shapes are different and the choice depends on the application and temperature:

- Food industry : silicone or detectable silicone (blue).
- High speed / thin plastic packaging: suction cup with thin lip MVS or FPC, low hardness 35sh to be preferred.
- Cardboard and abrasive materials: Natural rubber, Siton®.
- Electronics, semi-conductors : Antistatic silicone.
- Automotive: Siton® or Nitrile for oil resistance.
- Heavy loads : Siton® ou Nitrile.

Each material has a specific temperature range of use :

- **In green**, range for extended use.
- **In orange**, range for occasional use (contact time < 5s).

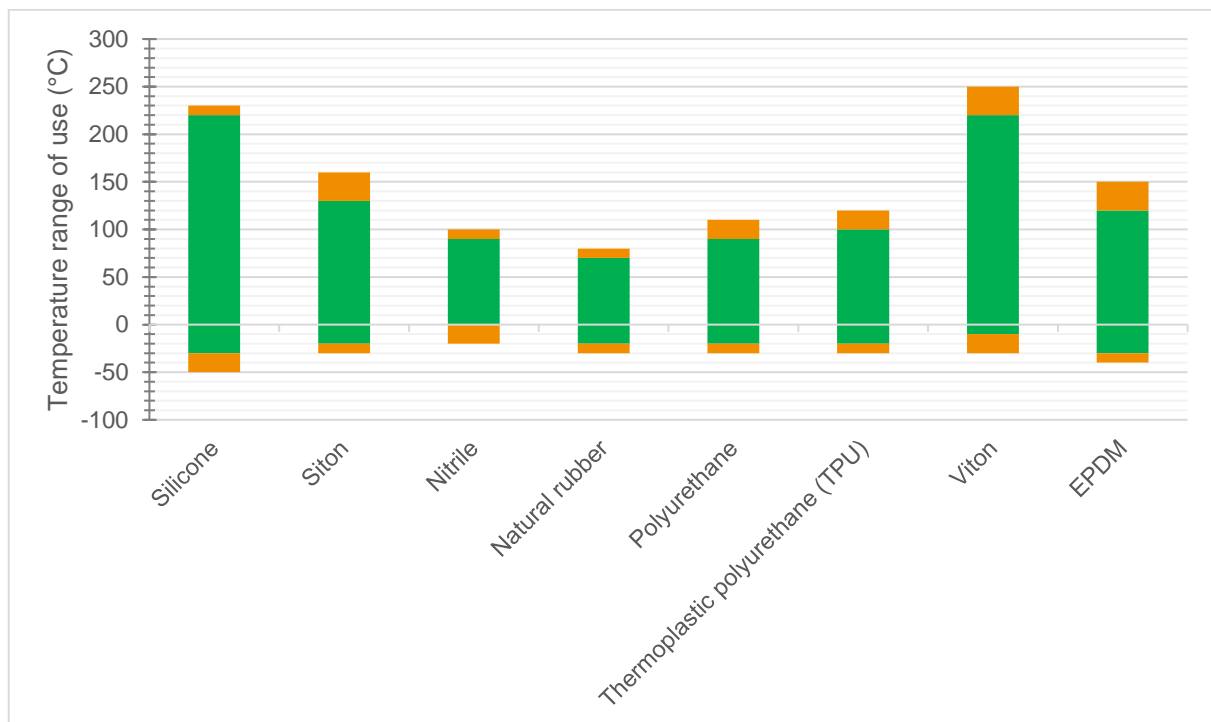


Figure 1: temperature range of use in Celsius degrees

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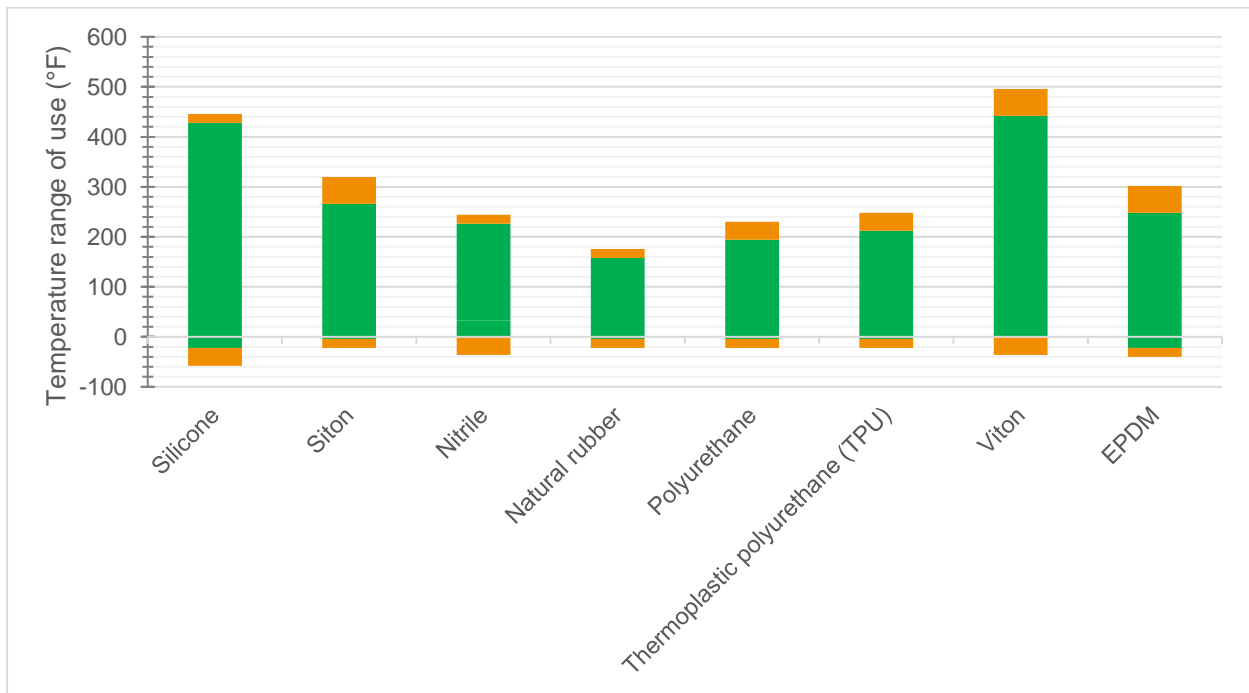


Figure 2 : temperature range of use in Fahrenheit



Use of suction cups outside their temperature range of use, wear, damage (cracking) or permanent change of shape (high temperatures) can appear.



Chemicals may be incompatible with the suction cup material and cause swelling or damage.

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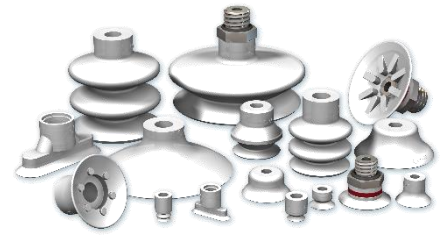
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SILICONE

Material:

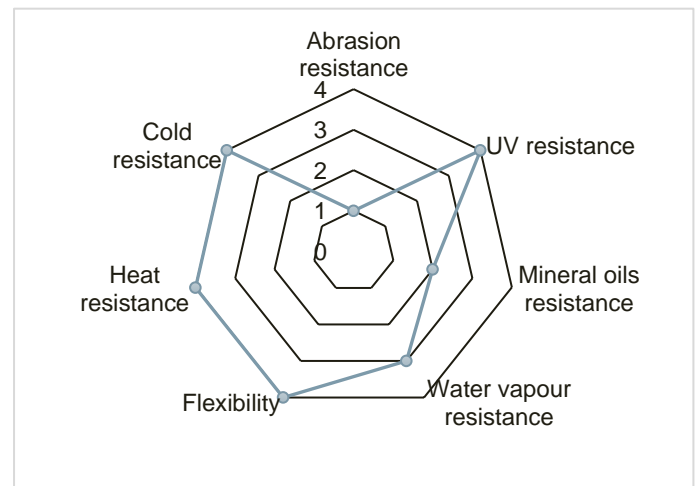
Silicone VMQ, fillers, colorant (if material is not translucent)



- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|-------------|----------|--------------------|
| SIT6 | Translucent | 60shA | +/- 5shA |
| SIT5/SI5 | Translucent | 50shA | +/- 5shA |
| SIT3/SI | Translucent | 35shA | +/- 5shA |
| SIB | White | 35shA | +/- 5shA |
| SIBL5 | Dark blue | 50shA | +/- 5shA |
| SIBL3 | Blue | 35shA | +/- 5shA |
| SI3B | Dark blue | 35shA | +/- 5shA |
| SIR | Red | 60shA | +/- 5shA |
| SI3 | Red | 35shA | +/- 5shA |

- Temperature range of use:
 - 40°C / +220°C in continuous
 - 40°F / +428°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils
 - Ammonia



NB: this list is not exhaustive. A more detailed list can be found on the following websites:

- [Chemical Compatibility | Global O-Ring and Seal \(globaloring.com\)](http://globaloring.com)
- [Compatibilité Chimique | Caoutchouc | Élastomère \(hitechseals.com\)](http://hitechseals.com)

- Certificates available on request:
 - REACH
 - EC 1935/2004 (except for red silicones SIR and SI3)
 - FDA CFR 21 177.2600

NB : For use in contact with foodstuffs, the suction cups must first be washed with soap or any other suitable detergent.
 Certificates of suitability for food contact can only be issued for references of suction cups alone.
 A suction cup + insert kit will not be certified.

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DETECTABLE SILICONE

Material:

Silicone VMQ, fillers, colorant

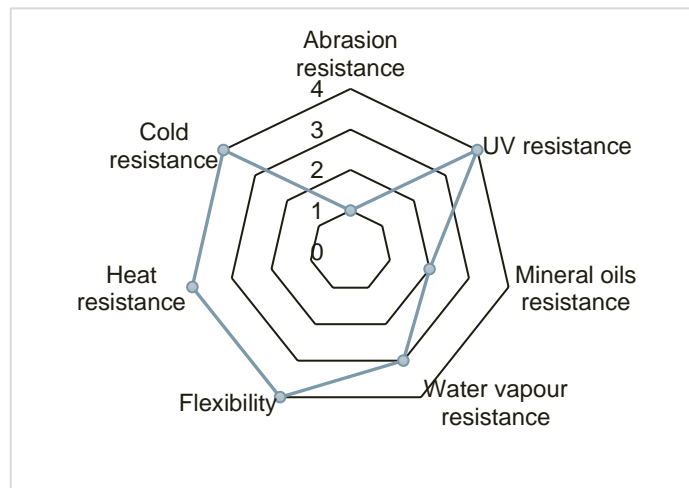


Metallic particles in the silicone compounds gives specific properties to the material: greater mechanical properties and the ability to detect it with metal detectors.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-------------------------|-----------|----------|--------------------|
| SI5D SID SI5BD | Dark blue | 50shA | +/- 5shA |
| SI3D SI3BD SIBL3D | Dark blue | 35shA | +/- 5shA |

- Temperature range of use:
-40°C / +220°C in continuous
-40°F / +428°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils
 - Ammonia



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ANTISTATIC SILICONE

Material:

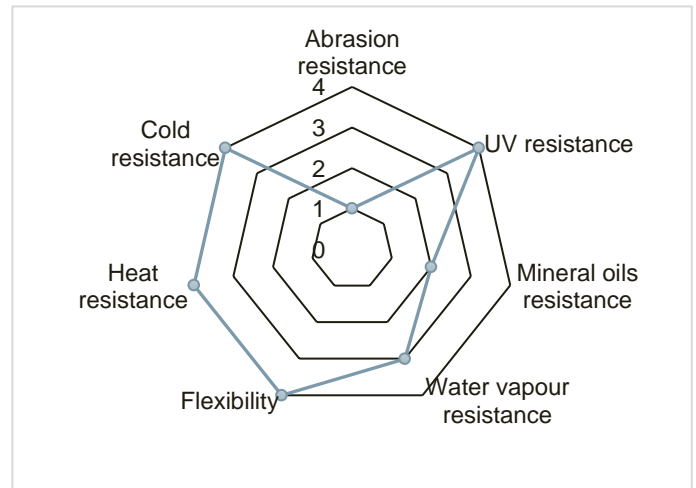
Silicone VMQ, fillers (carbon black)

The material is slightly conductive thanks to the addition of particles to the silicone base. It is used to limit electrostatic discharges, particularly in the electronics sector.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|--------------------|----------|--------------------|
| SIA | Black with red dot | 60shA | +/- 5shA |

- Temperature range of use:
 - 40°C / +220°C in continuous
 - 40°F / +428°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils
 - Ammonia



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NITRILE

Material:

Nitrile, fillers, colorant
Does not contain silicone

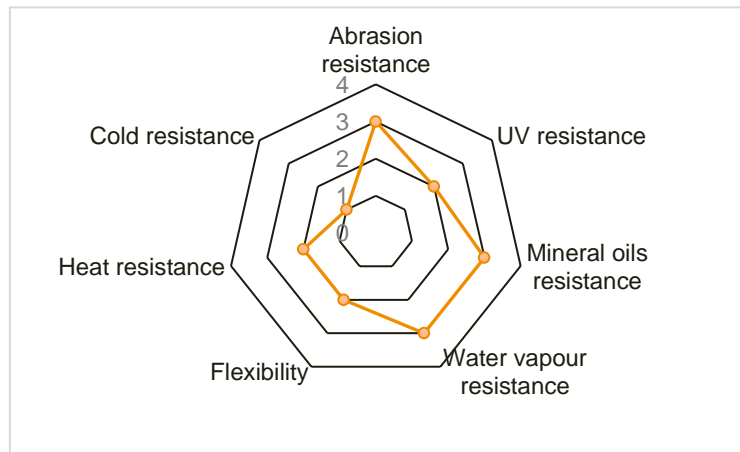


This material is widely use in COVAL range because of its very good cost/mechanical qualities (resistance to abrasion and tearing) as well as its resistance to hydrocarbons.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------------|-----------|----------|--------------------|
| NBR | Black | 60shA | +/- 5shA |
| C series | Dark grey | 60shA | +/- 5shA |

- Temperature range of use:
0°C - 90°C in continuous
32°F - 194°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Vinegar
 - Acetone
 - Ozone



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SITON®

Material:

Hydrogenated nitrile (HNBR), fillers, colorant.
Does not contain silicone.



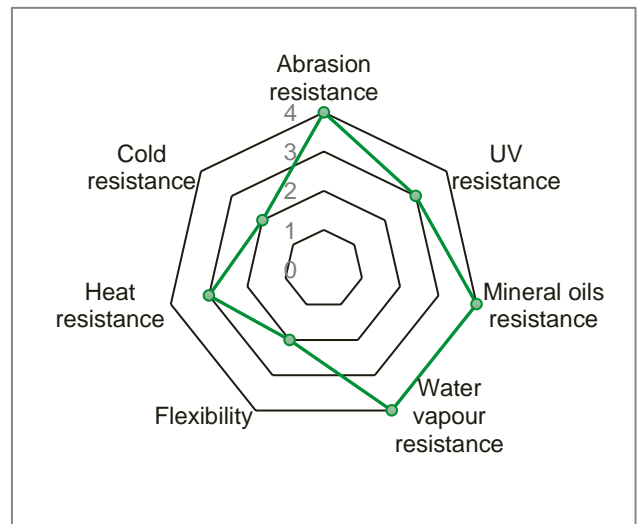
STN® material is based on hydrogenated nitrile (HNBR). It is used to replace nitrile when the latter reaches its temperature limits, in the presence of ozone or under heavy abrasion. It is also non-marking on surfaces.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|-------|----------|--------------------|
| STN | Blue | 60shA | +/- 5shA |
| STNV6 | Green | 60shA | +/- 5shA |
| STN5 | Blue | 50shA | +/-5shA |

- Temperature range of use :
 - 20°C (-4°F) / +130°C (+266°F) in continuous
 - 30°C (-22°F) / +160°C (+320°F) in peak (contact time <5s)

- Non-Marking properties (internal test method) under the following conditions:
 - Temperature and relative humidity: 10°C (50°F) to 40°C (104°F), 30 to 70% RH
 - Clean suction cups and substrate wiped with isopropyl alcohol before use.
 - The substrate must also be clean, dry and free of particles.



- Example of chemical substances that should not come into contact with the material (high risk of breakdown and degradation):
 - Acetone.
 - Halogenated compounds (fluorine, chlorine, bromine).
 - Skydrol hydraulic fluid (aeronautical).

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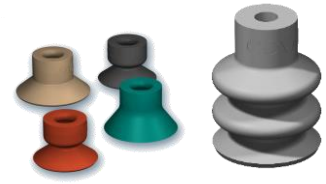
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NR (Natural Rubber)



Material :

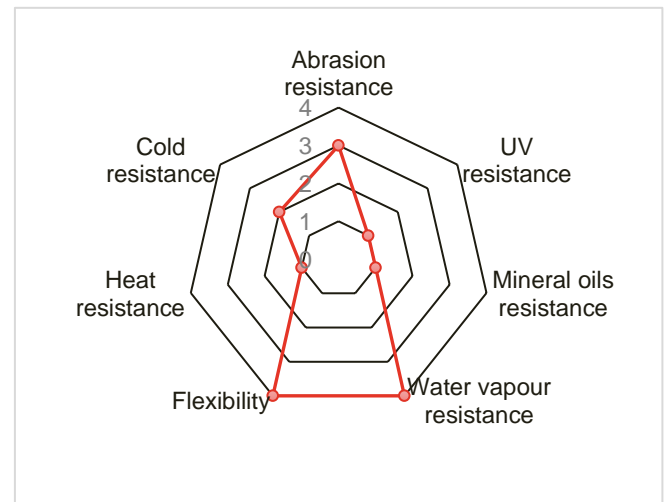
Natural rubber (NR) and Styrene Butadiene Rubber, fillers, colorant

This material is a blend of natural rubber from the rubber tree and synthetic rubber (SBR). It has a low cost and is used to grip abrasive materials such as cardboard.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|--|----------|--------------------|
| NR | Grey Brown, black, orange, green (VPR range) | 50shA | +/- 5shA |

- Temperature range of use:
-20°C / +70°C in continuous
-4°F / +158°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Ozone
 - UV
 - Vinegar
 - Mineral oil
 - Halogenated compounds (chlorine, fluorine, bromine ...)



NB: this list is not exhaustive. A more detailed list can be found on the following websites:

- <https://www.swiftsupplies.com.au/rubber-chemical-resistance-and-compatibility-guide/>
- [N1021A Novotema Elastomer Chemical Compatibility Brochure EN.pdf](#)

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PU

Material :

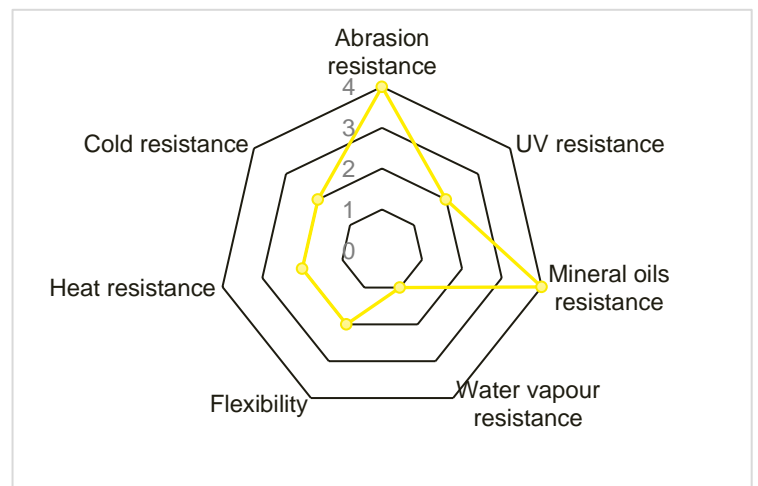
Polyurethane elastomer, fillers, colorant

This material is highly resistant to abrasion and mineral oils..

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|-------|----------|--------------------|
| PU | Black | 60 shA | +/- 5shA |
| PUB | Blue | | |

- Temperature range of use:
-20°C / +90°C in continuous
-4°F / +194°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Acetone
 - Alcools
 - Water



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TPU (polyuréthane thermoplastique)



Material :

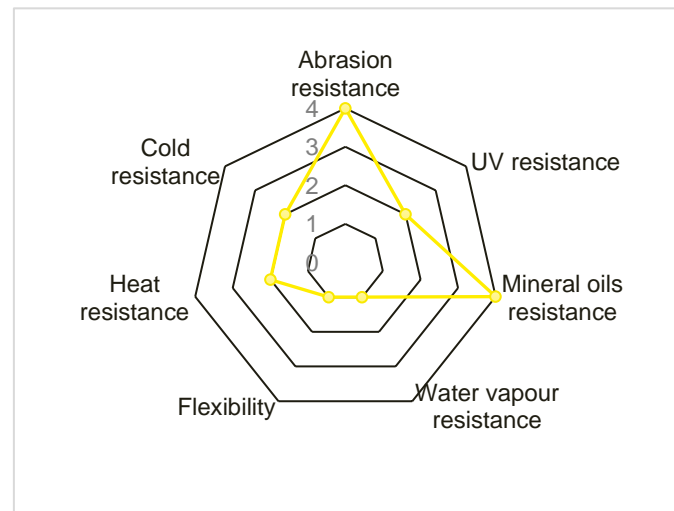
Thermoplastic polyurethane elastomer, fillers, colorant

This material is highly resistant to abrasion and mineral oils.

- Color and hardness available (depends on the range of cups):

| Product ge | Color | Hardness | Hardness tolerance |
|---------------|-------|----------|--------------------|
| CTC | Blue | 85 shA | +/- 5shA |

- Temperature range of use:
-20°C / +100°C in continuous
-4°F / +212°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Acetone
 - Water
 - Alcohols



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VITON

Material :

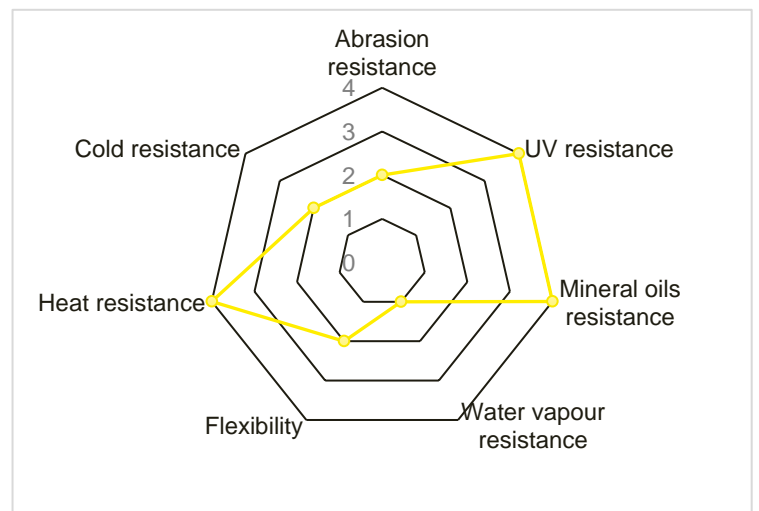
FKM fluoroelastomer, fillers, colorant

FKM is used in aggressive environments combining high temperatures and contact with chemicals.

- Color and hardness available (depends on the range of cups):

| Reference | Color | Hardness | Hardness tolerance |
|-----------|-------|----------|--------------------|
| FPM | Black | 60shA | +/- 5shA |

- Temperature range of use:
 - 20 / +220°C in continuous
 - 4 / 428°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Acetone
 - Sodium hydroxide



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COVAL-flex (film PU)

COVAL-flex

Material :

- Gel : Silicone
- Adhesive : double sided acrylic transfer
- Film : polyurethane.

This material is made of a silicone gel covered with a polyurethane film and an acrylic double-sided adhesive.

- Color
 - Translucent
- Hardness: 20sh0
- Temperature range of use:
 - 40°C / 180°C in continuous (200°C if contact time <5min)
 - 40°F / 356°F in continuous (392°F if contact time <5min)
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Ammonia

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COVAL-flex (varnish)

COVAL-flex

Material :

- Gel and varnish : Silicone
- Adhesive : double sided acrylic transfer

This material is made of a silicone gel covered with a varnish and an acrylic double-sided adhesive.

- Color :
Translucent
- Hardness : 20sh0
- Temperature range of use:
-40°C / 180°C in continuous (200°C if contact time <5min)
-40°F / 356°F in continuous (392°F if contact time <5min)
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Ammonia

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EPDM FOAM (Vacuum gripper)



Material :

- Foam : EPDM
- Adhésive : double sided acrylic tape

This material is an adhesive foam in EPDM.

- Color :
Black
- Density :
110 +/-20 kg/m³
6.8 +/-1.2 lb/ft³
- Adhesives :
 - Standard (brown protective film)
 - Wetland area (red protective film)
- Temperature range of use:
 - 40°C – 120°C in continuous
 - 40°F – 248 °F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils

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EPDM FOAM (cups BM)



Material :

- Closed cells EPDM

For suction cups series VSA-VS BM NBR

- Color :
Black
- Density :
175 +/-25kg/m³
10.9 +/-1.6 lb/ft³

Hardness :
30-50sh0

- Temperature range of use:

-40°C / + 110°C in continuous
-40°F / +230°F
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils

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RUBBER FOAM (BMNR)

Material :

Natural rubber

This material is a foam made from natural rubber.

- Color :
 - Orange
- Density :
 - 270 kg/m³
 - 16.8 +/-5 lb/ft³
- Temperature range of use:
 - 20°C +70°C in continuous
 - 4°F +158°F in continuous
- Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral and vegetable oil
 - Halogenated compounds (chlorine, fluorine, bromine ...)

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 - [N1021A Novotema Elastomer Chemical Compatibility Brochure EN.pdf](#)
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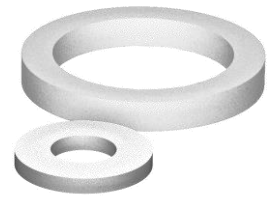
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SILICONE FOAM



Material :

Sponge silicone

For suction cups VSA-VS BM / VSA-VS BMSIF

- Color :
White
 - Density :
250-300kg/m³ (15.6-18.7 lb/ft³) for BMSI
400kg/m³ (25 lb/ft³) for BMSIF
 - Temperature range of use:
-50°C +200°C in continuous (220°C if contact time <5min)
-58°F +392°F in continuous (428°F if contact time <5min)
 - Example of chemical substances that should not come into contact with the material (high risk of attack and degradation of the material):
 - Mineral oil
 - Oils
 - Ammonia
- NB: this list is not exhaustive. A more detailed list can be found on the following websites:
- [Chemical Compatibility | Global O-Ring and Seal \(globaloring.com\)](http://globaloring.com)
 - [Compatibilité Chimique | Caoutchouc | Élastomère \(hitechseals.com\)](http://hitechseals.com)
- Certificates available on request:
 - REACH
 - FDA CFR 21 177.2600 (for references with SIF)

Information provided in this document is the result of laboratory tests. However, it cannot be considered as a commitment on the part of COVAL. Changes may be made at any time without notice. The user is advised to verify the data before use. Our technical department is at your disposal for any recommendation.

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