

# SIVIC®

## Polyblends by SIDIAC

### PRODUCTION CHARACTERISTICS

- ✓ Dedicated Production Units
- ✓ Systematic Straining
- ✓ Narrow Range Of Viscosities ( $\pm 3$ )
- ✓ Tailor Made Grades
- ✓ Many Presentations Possible
  - Sheets
  - 1/2 Sheets
  - 25 kg Polyethylene Bags
  - 25 kg Thermofusible Bags



la Qualité en tête

**ISO 9001**  
version 2008



le mélange caoutchouc

[www.sidiac.com](http://www.sidiac.com)



la Nature en tête

**ISO 14001**  
version 2004

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S.A.S au capital de 972 000 Euros - Siège Social et Usine à la Maillerie - CCP Bordeaux 3085 85 M - R.C.S. Angoulême B 651 820 177 - SIRET 651 820 177 00012

**SIVIC®** Trademark SIDIAC



# SIVIC®

## Polyblends by SIDDIAC

### WHY NBR

#### NBR

- ✓ Excellent Chemical Resistance (Fuels + oils)
- ✓ Elasticity
- ✓ Low specific Gravity
- ✓ Ease of Formulation
- ✓ Ease of Processing

### WHY PVC

#### PVC

- ✓ Excellent Ozone Resistance
- ✓ Excellent Chemical Resistance
- ✓ Excellent Mechanical Properties
- ✓ Fire Resistance
- ✓ Good Processability (extrusion)

### SIVIC® Properties

Ozone Resistance

Fuel Resistance

Elasticity

Extrudability

Sulfur & Peroxide  
Vulcanization



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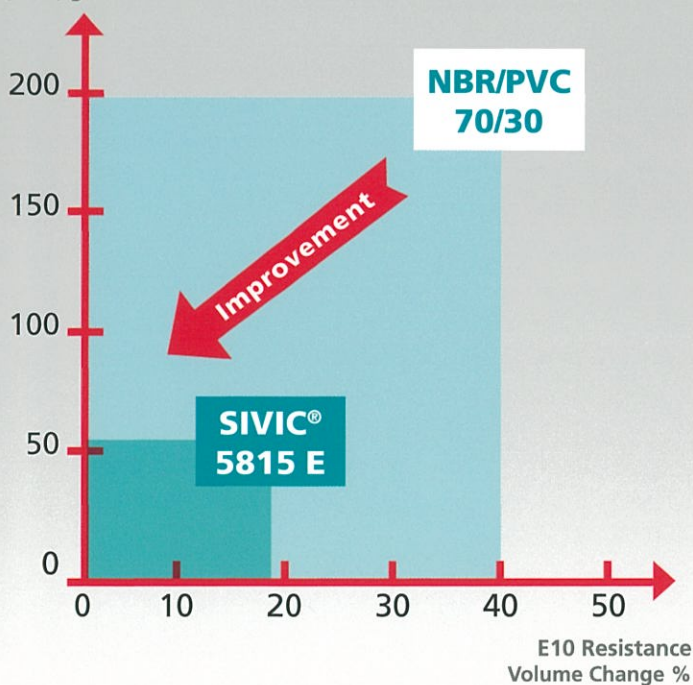
# SIVIC®

## Polyblends by SIDIAC

### LOW PERMEABILITY TO FUEL & GASOLINE

**SIVIC® 5815 E**

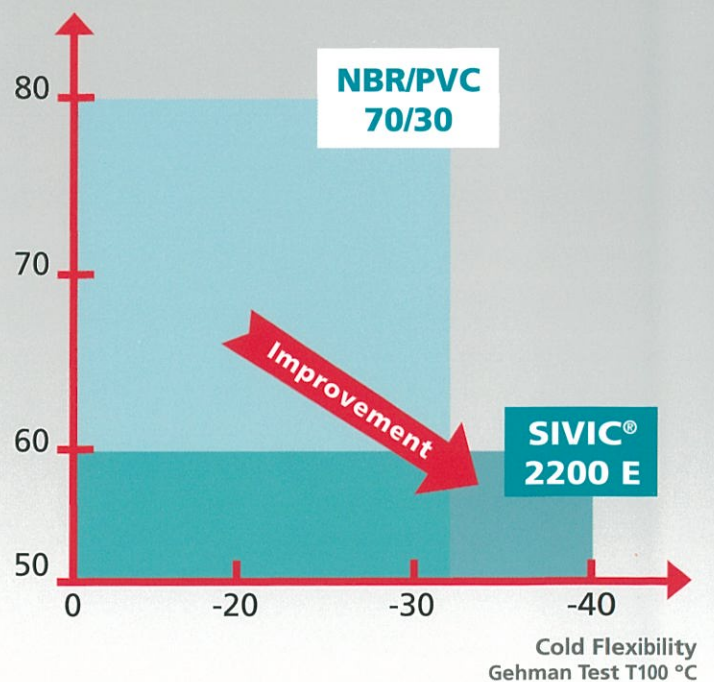
Permeability to E10  
(40°C) g/m<sup>2</sup>.d



### COLD FLEXIBILITY AND ABRASION RESISTANCE

**SIVIC® 2200 E**

Abrasion Resistance  
Volume loss (DIN) mm<sup>3</sup>



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# Cold flexibility and abrasion resistance

## SIVIC® 220C Industrial hose

NBR / PVC  
70 / 30

SIVIC® 220C

### Indicative SIDIAC

#### Formulation

<b>SIVIC® 2200 E</b>	<b>100</b>
Carbon black N330	30
Silica (180 m <sup>2</sup> /g)	15
Plasticizer DBEEA	20
Zinc oxide	5
Stearic acid	1
Silane TESPT	1
Antioxidant ODP	1
Paraffin wax	2
Processing aid	2
Sulphur 80 %	1,875
MBTS 75 %	2
TMTD 80 %	0,625
<b>Total phr</b>	<b>181,5</b>

**NBR/PVC = 100**  
**No plasticizer**  
**ML(1+4), 100°C = 60**

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#### Initial properties

<b>Hardness Shore A, 30" (points)</b>	<b>70</b>	<b>68</b>
Tensile strength (MPa)	16,5	17,0
Elongation at break (%)	525	520

#### Abrasion resistance

<b>DIN</b> <b>Δ Volume (mm<sup>3</sup>)</b>	<b>80</b>	<b>60</b>
<b>TABER</b> <b>Δ Volume (mm<sup>3</sup>)</b> (500 cycles, wheels: H18, load: 1 kg)	<b>90</b>	<b>60</b>

#### After ageing (70 hours at 100°C)

Δ Hardness (points)	5,5	5,0
Δ Tensile (%)	- 5,0	- 5,3
Δ Elongation (%)	- 35,0	- 32,0

#### ASTM n°3 resistance (70 hours at 100°C)

Δ Volume (%)	- 1,5	2,0
Δ Tensile (%)	- 18,0	- 18,0
Δ Elongation (%)	- 40,0	- 35,0

#### Fuel B resistance (2 days at 23°C)

Δ Volume (%)	21,0	20,0
Δ Tensile after drying (%)	- 15,6	- 3,1
Δ Elongation after drying (%)	- 17,9	- 8,3

#### Ozone resistance (40°C, 55 % humidity)

200 pphm, Elongation: 20 %	-	> 96 h
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#### Cold flexibility

<b>Bending at - 40 °C</b>	<b>FAIL</b>	<b>PASS</b>
<b>Impact at - 40 °C</b>	<b>FAIL</b>	<b>PASS</b>
<b>GEHMAN Test - T10 (°C)</b>	<b>- 20</b>	<b>- 27</b>
<b>GEHMAN Test - T100 (°C)</b>	<b>- 32</b>	<b>- 40</b>



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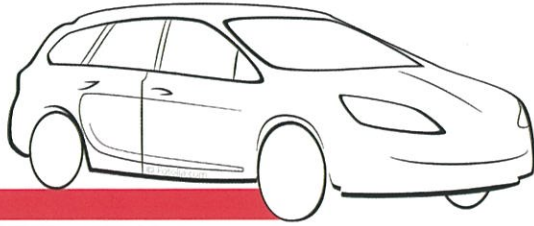
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## SIVIC® 5815

### Automotive Hose

Oil-extended SIVIC  
No phthalates

NBR / PVC  
70 / 30

SIVIC® 581

#### Indicative SIDIAC

##### Formulation

NBR/PVC 70/30 - 100  
SIVIC® 5815 E 115 -

Carbon black N550	20	
Carbon black N772	40	
Plasticizer DBEEA	25	
Zinc oxide	5	
Stearic acid	0,5	
Phenolic antioxidant	0,5	
Antioxidant MMBI	1	
Sulphur 80 %	0,4	
MBTS 75 %	1,35	
TBzTD 70 %	4	
<b>Total phr</b>	<b>213</b>	<b>198</b>

**NBR/PVC = 100**  
**15 phr plasticizer**  
**ML(1+4), 100°C = 73**

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	NBR / PVC 70 / 30	SIVIC® 581
<b>Initial properties</b>		
<b>Hardness Shore A (points)</b>	<b>68</b>	<b>71</b>
Tensile strength (MPa)	12,5	12,7
Elongation at break (%)	500	425
<b>Ozone resistance (40°C, 55% humidity)</b>		
50 pphm, Elongation: 20 %	-	> 96 h
<b>Fuel C resistance after 72h - 23°C</b>		
Δ Hardness (points)	- 17	- 15
Δ Tensile strength (%)	- 33	- 29
Δ Elongation at break (%)	- 12	- 6
Δ Volume (%)	28	18
Δ Volume after drying 24h - 80°C (%)	- 15	- 14
<b>E10 resistance after 72h - 23°C</b>		
Δ Hardness (points)	- 19	- 16
Δ Tensile strength (%)	- 41	- 32
Δ Elongation at break (%)	- 28	- 9
Δ Volume (%)	40	18,5
Δ Volume after drying 24h - 80°C (%)	- 16	- 17
<b>E100 Pure Ethanol resistance after 72h - 23°C</b>		
Δ Hardness (points)	- 3	1
Δ Tensile strength (%)	- 13	- 10
Δ Elongation at break (%)	- 15	- 16
Δ Volume (%)	4	5
Δ Volume after drying 24h - 80°C (%)	- 13	- 12
<b>B30 resistance after 72h - 23°C</b>		
Δ Hardness (points)	2,0	2,5
Δ Tensile strength (%)	- 1	0
Δ Elongation at break (%)	- 4	- 6
Δ Volume (%)	2,3	- 1,5
Δ Volume after drying 24h - 80°C (%)	- 3,6	- 4,3
<b>E10 permeability at 40°C</b>		
<b>Test through membrane* (g/m².j)</b>	<b>1200</b>	<b>370</b>
<b>Hose permeability (g/m².j)</b>	<b>200</b>	<b>60</b>



# Solvent and ink Resistance

## SIVIC® 5200

Low hardness  
printing roll

Oil-extended SIVIC  
No phthalates

High chemical Resistance  
Long term shrink Resistance

### Test conditions in pure solvents :

Hexane	3 days at 23°C
Isopropyl Alcohol	3 days at 23°C
White Spirit	3 days at 23°C
Standard Ink	7 days at 70°C
Vegetable Oil	7 days at 70°C

### Indicative SIDIAC

#### Formulation

<b>Sivic® 5200 B</b>	150
Plasticizer	35
Stearic acid	0,5
Antioxidant	1,5
Zinc oxide	4
Coloration	3,5
Tackyfing resin	5
Silica	10
Calcinated Clay	15
Sulphur 80 %	1,88
MBTS 75 %	1,5
TMTM 80 %	0,6
<b>Total phr</b>	<b>228,28</b>

\* after drying

Nitrile / PVC / plast  
(60 / 40 / 70)

**SIVIC® 5200**

Initial properties		
Specific gravity	1,16	1,16
Hardness Shore A	29	30
Chemical resistance	Volume change	
Hexane *	- 40 %	- 13,7 %
Isopropyl Alcohol *	- 30,4 %	- 15,4 %
White Spirit *	- 31,7 %	- 11,1 %
Standard Ink	- 31,0 %	- 8,9 %
Vegetable Oil	- 40,7 %	- 25,7 %
Chemical resistance	Hardness change	
Hexane *	+ 39 pts	+ 16,5 pts
Isopropyl Alcohol *	+ 21,5 pts	+ 16 pts
White Spirit *	+ 26 pts	+ 8,5 pts
Standard Ink	+ 26,5 pts	+ 11,5 pts
Vegetable Oil	+ 39,5 pts	+ 15,2 pts

**NBR/PVC = 100 • 50 phr plasticizer • ML(1+4), 100°C = 25**

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## Automotive Hoses

### Indicative SIDIAC Formulation

<b>SIVIC® N 3970</b>	<b>100</b>
N550 (FEF)	10
N772 (SRF)	40
DBEEA	20
Zinc oxide	5
Stearic acid	0,5
TMQ antioxidant	1
IPPD	1
TMTD 80%	2,5
DTDM 80%	1,875
CBS 80%	1,875
<b>Total phr</b>	<b>183,75</b>

**NBR/PVC = 100**  
**MS(1+4), 100°C = 52**

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WSD-M96D20-A  
Ford Specification

**SIVIC® N 3970**

Initial properties		
Hardness IRHD	65 - 75	70
Hardness Shore A	62 - 72	66
M100 modulus	3 to 4,5 MPa	4,0
Tensile strength	> 10 MPa	16,0
Elongation at break	> 250 %	432
Heat ageing (168h@100°C)		
Hardness IRHD	< 90	75
Tensile strength	> 10 MPa	17,0
Elongation at break	> 150 %	350
Compression Set (25% compression)		
CS after 70h@100°C	< 50%	34
IRM 903 resistance (70h@100°C)		
Δ Volume	- 10 to + 10 %	-5
Hardness IRHD	< 85	65
Tensile strength	> 10 MPa	17,3
Elongation at break	> 200 %	342
Ozone resistance (38°C, 55% humidity) after M15* conditioning		
50 pphm, Elongation: 20%	70h	> 70
Cold flexibility (-40°C after M15* conditioning)		
Number of cracks	0	0
Fuel C resistance (70h@23°C)		
Δ Volume	< 40%	31
Hardness IRHD	> 45	54
Tensile strength	> 8 MPa	8,5
Elongation at break	> 150 %	296
Δ Volume after drying (24h@80°C)	> -20%	-11,7
M15* resistance (70h@23°C)		
Δ Volume	< 50%	49
Hardness IRHD	> 40	49
Tensile strength	> 6 MPa	6,3
Elongation at break	> 150 %	204
Δ Volume after drying (24h@80°C)	> -20%	-13,5
SOUR GAS resistance (14 days @60°C)		
Hardness IRHD	> 40	47
Tensile strength	> 3 MPa	5,1
Elongation at break	> 100 %	138

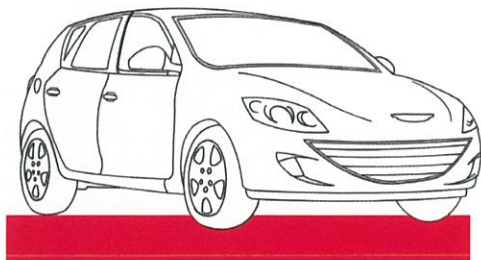
\* M15 : 85% Fuel C / 15% MeOH



SIVIC® 5100

Automotives Hoses

High resistance to Fuel C, diesel, bio-diesel and flex fuels



Specifications  
WSD-M96D20-A

SIVIC® 5100

Initial properties		
Hardness Shore A	65 - 75 shA	67
Tensile strength	> 10 MPa	15,0
Elongation at break	> 250%	433
After ageing (7 days at 100°C)		
Hardness Shore A	< 90 shA	73,5
Δ Hardness	< + 15 shA	6,5
Tensile strength	> 10 MPa	16,0
Δ Tensile	> - 25 %	6,5%
Elongation at break	> 150 %	315
Δ Elongation	> - 60 %	- 27,3%
ASTM n° 3 resistance (70 hours at 100°C)		
Δ Volume	- 10 to + 10%	- 8,2
Hardness Shore A	< 85 shA	81
Δ Hardness	- 10 to + 15 pts	14
Tensile strength	> 10 MPa	15,8
Δ Tensile	> - 30 %	5,3%
Elongation at break	> 200 %	321
Δ Elongation	> - 50 %	- 25,9%
Ozone resistance (40°C, 55% humidity)		
50 pphm, Elongation : 20%	70 h	> 96
Cold flexibility - Gehman test		
T 10 (°C)	-	- 17,5
T 100 (°C)	-	- 26

Indicative SIDIAC  
Formulation

<b>SIVIC® 5100</b>	100
N550 (FEF)	30
N990	30
Plasticizer	25
Zinc oxide	5
Stearic acid	0,5
Phenolic antioxidant	0,5
Antioxidant MMBI	1
Sulphur 80%	0,65
MBTS 75%	1,35
TMTD 80%	2,5

**Total phr 196,5**

**NBR/PVC = 100**  
**No plasticizer**  
**MS(1+4), 100°C = 55**



le mélange caoutchouc

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SIVIC® 5100

Automotives Hoses

High resistance to Fuel C, diesel, bio-diesel and flex fuels

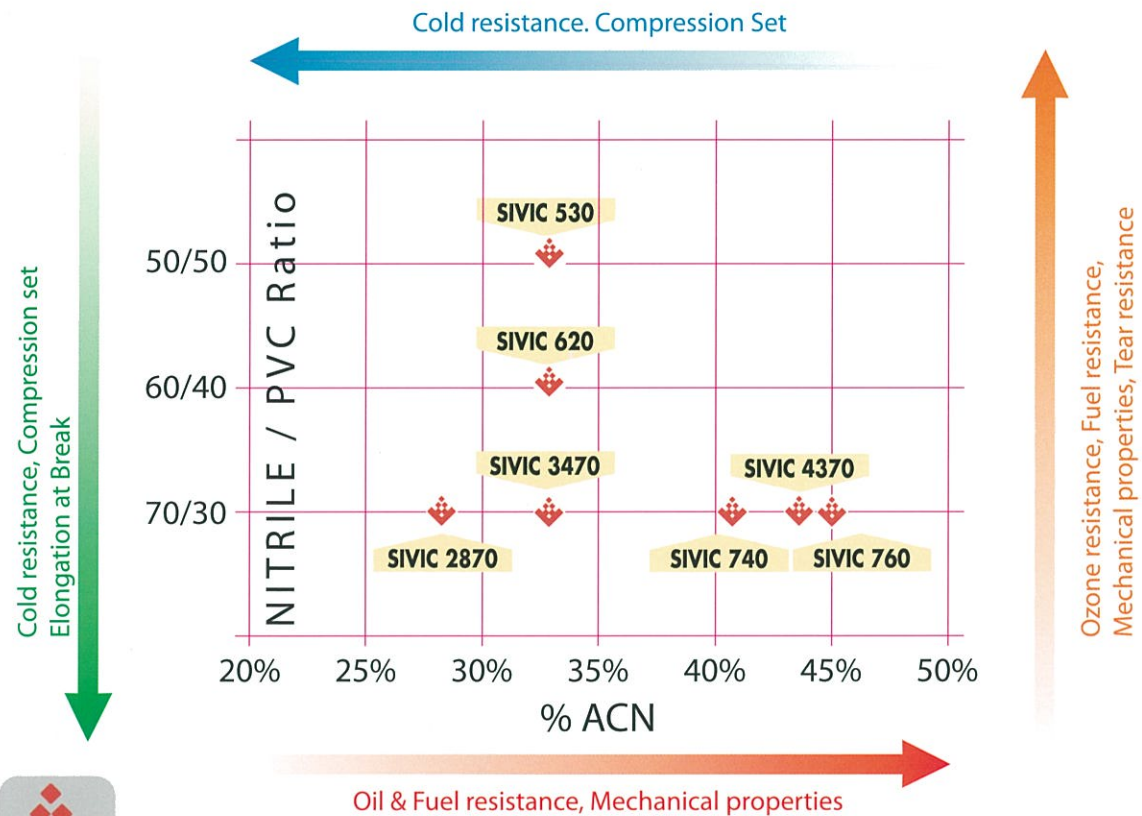
	Specifications	FUEL C 70h at 23°C	Diesel oil 7 days at 40°C	Colza Diester 7 days at 40°C
Before drying				
Δ Volume	< 40%	21,4	- 0,3	1,5
Hardness Shore A	> 45 shA	60,5	72	71
Δ Hardness	> - 25 pts	- 6,5	5	4
Tensile strength	8 MPa	9,6	14,4	15,1
Δ Tensile	> - 50%	- 35,9%	- 3,9%	1,0%
Elongation at break	> 150%	370	414	426
Δ Elongation	> - 50%	- 14,5%	- 4,4%	- 1,6%
After drying				
Shrinkage after drying	> - 15%	- 10,3	- 7,3	- 7,6

	Specifications	FUEL C + 15% MeOH 70h at 23°C	FUEL C + 15% ETBE 70h at 23°C
Before drying			
Δ Volume	< 50%	33,2	21,9
Hardness Shore A	40 shA	59,5	61
Δ Hardness	> - 30pts	- 7,5	- 6
Tensile strength	> 6 MPa	8,8	9,2
Δ Tensile	> - 55%	- 41,3%	- 38,6%
Elongation at break	> 150%	304	327
Δ Elongation	> - 55%	- 29,8%	- 24,5%
After drying			
Shrinkage after drying	> - 15%	- 12	- 10,2



# SIVIC<sup>®</sup> POLYBLEND

## ACN CONTENT & NBR/PVC RATIO INFLUENCE ON SIVIC<sup>®</sup> BASED COMPOUNDS



le mélange caoutchouc

SIVIC<sup>®</sup>: Trademark SIDIAC France





Product Types	NBR/PVC Ratio	% ACN <sup>(1)</sup>	Mooney Viscosity	Plasticizer (phr)	Specific Gravity	Special Properties and applications
<b>Standard Types</b>						
<b>SIVIC 2870</b>	70/30	28	70-80 (ML)	-	1.070	Low ACN based polymer, good extrudability and cold flex properties. Multipurpose grade for industrial hose, cable, conveyor belt, ...
<b>SIVIC 3470</b>	70/30	33	63-73 (ML)	-	1.070	Medium ACN based polymer for improved physical properties and good extrudability. Multipurpose grade for automotive (air-ducts), hoses, ...
<b>SIVIC 4370</b>	70/30	44	71-85 (ML)	-	1.090	High ACN content for improved fuel resistance in automotive applications.
<b>SIVIC 740</b>	70/30	41	60-68 (MS)	-	1.085	High ACN content for improved fuel resistance in automotive applications (parts in contact with fuels).
<b>SIVIC 760</b>	70/30	45	49-61 (MS)	-	1.085	Highest ACN content for maximum fuel resistance (in automotive applications parts in contact with fuels).
<b>SIVIC 620</b>	60/40	33	46-56 (MS)	-	1.100	Fuel, ozone and fire resistant blend for general purpose cable, belting and hose applications.
<b>SIVIC 530</b>	50/50	33	55-65 (MS)	-	1.130	Improved ozone and fire resistance for hose covers, cable jackets, conveyor belts and cellular goods.
<b>Specific Types</b>						
<b>SIVIC 1100</b>	100	28	50-60 (MS)	-	1.070	Good fluid and fire resistance blend with excellent mechanical properties. Used for closed-cell foams.
<b>SIVIC 1220</b>	100	30	63-73 (ML)	20	1.120	Phtalate free oil extended blend for shock absorption in closed-cell foams.
<b>SIVIC 2100</b>	100	31	65-75 (ML)	-	1.065	Very good abrasion resistance blend for automotive hose covers and industrial hoses.
<b>SIVIC 2200</b>	100	30	55-65 (ML)	-	1.050	Good abrasion resistance and cold flexibility for automotive and industrial hoses.
<b>SIVIC 3200</b>	100	28	50-60 (ML)	-	1.040	Optimum cold flexibility blend for automotive and industrial hoses.
<b>SIVIC 4100</b>	100	28	50-60 (ML)	-	1.040	Good compression set blend for molded articles.
<b>SIVIC 5100</b>	100	45	50-60 (MS)	-	1.085	High resistance to bio-diesel and flex fuels for automotive hoses.
<b>SIVIC 5115</b>	100	45	55-65 (ML)	15	1.090	Phtalate free polyblend for high resistance to bio-diesel and flex fuels for automotive hoses.
<b>SIVIC 8010</b>	100	28	65 (ML)	10	1.080	Very good ozone resistance and adhesion of rubber to fabrics, for fire and irrigation hoses.
<b>SIVIC E 8610</b>	100	28	60-72 (ML)	10	1.090	Special extrusion grade for EM2 cable sheaths.
<b>Printing Roll Types</b>						
<b>SIVIC 2710</b>	60/40	33	18-26 (ML)	70	1.050	Oil extended blend with 70 phr of plasticizer. Good ozone resistance for low hardness printing rolls.
<b>SIVIC 6475</b>	62.5/37.5	33	14-26 (ML)	75	1.050	Oil extended blend with 75 phr of plasticizer for low hardness printing rolls.
<b>SIVIC 5200</b>	100	33.5	20-30 (ML)	50	1.045	Phtalate free polyblend with 50 phr of plasticizer. High chemical and long term shrink resistance for printing rolls.

(1) Measured on NBR post.



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e mélange caoutchouc

# SIVIC® SELECTION

Product Types	% ACN (1)	Mooney Viscosity (ML)	Plasticizer (phr)	Special Properties	Examples of Applications
<b>SIVIC 2870</b>	28	70-80 (ML)	-	Low ACN content based polymer, good extrudability and cold flex properties.	<b>Multipurpose standard grade</b> Industrial hoses, Cables...
<b>SIVIC 3470</b>	34	63-73 (ML)	-	Medium ACN content based polymer for improved physical properties and good extrudability	<b>Multipurpose standard grade</b> Industrial hoses, Cables...
N 3970 → <b>SIVIC 3970 E</b>	39	48-58 (MS)	-	High ACN content for improved fuel resistance	Automotive parts with good fuel resistance
N 4570 → <b>SIVIC 5100 E</b>	45	50-60 (MS)	-	High resistance to bio-diesel and flex fuels for automotive hoses.	Automotive parts with higher fuel resistance
<b>SIVIC 5815 E</b>	Ultra high	68-78 (ML)	15	Phthalate free polyblend for very low permeability to flex fuels	Automotive parts for low fuel permeability (filler hoses...)
<b>SIVIC 2200 E</b>	Medium	57-67 (ML)	-	Good abrasion resistance and cold flexibility	Industrial and Hydraulic hoses

1 Measured on NBR part



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