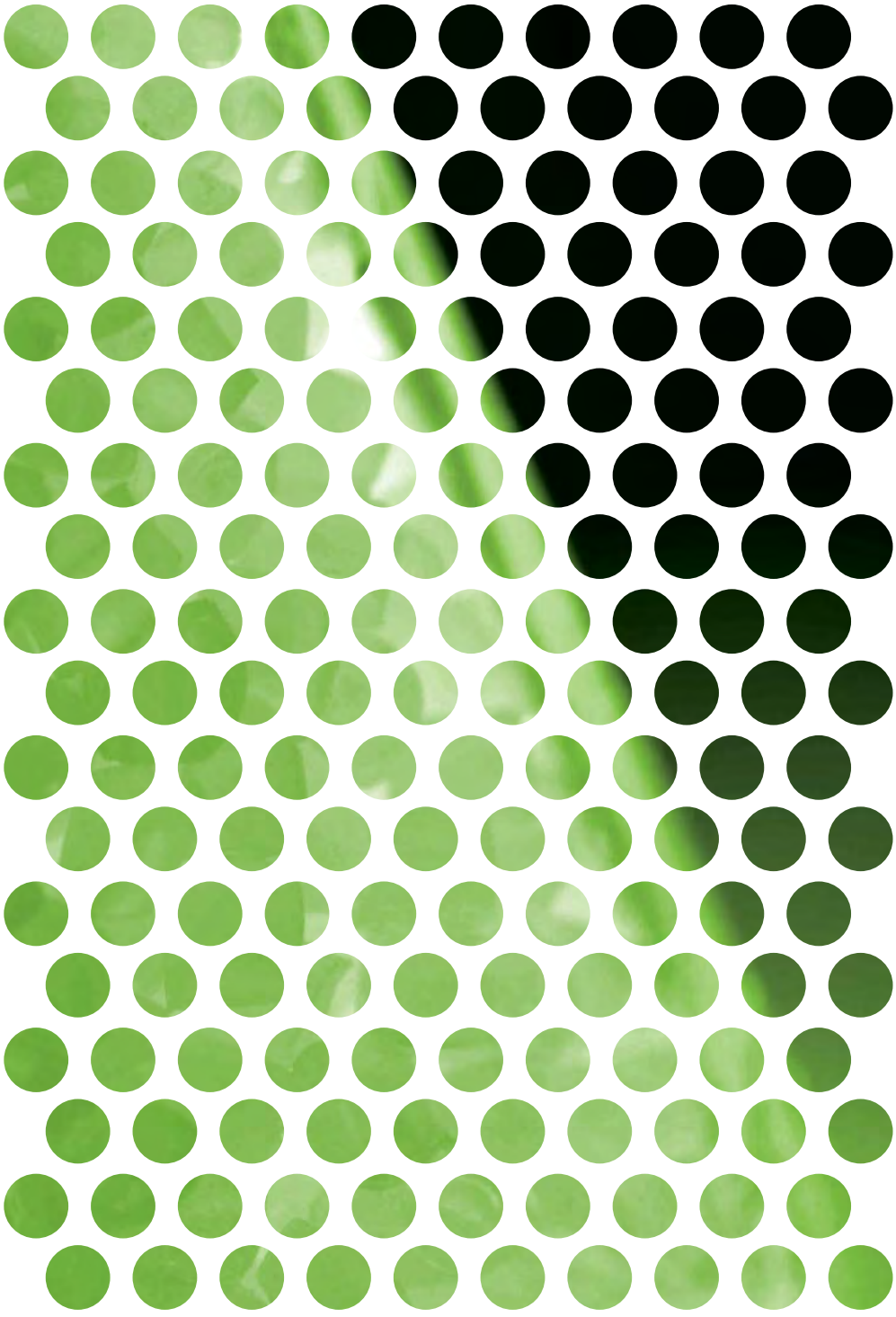


RADICI GROUP

RADIPOL® for MONOFILAMENT

RadiPol®

A wide range of products

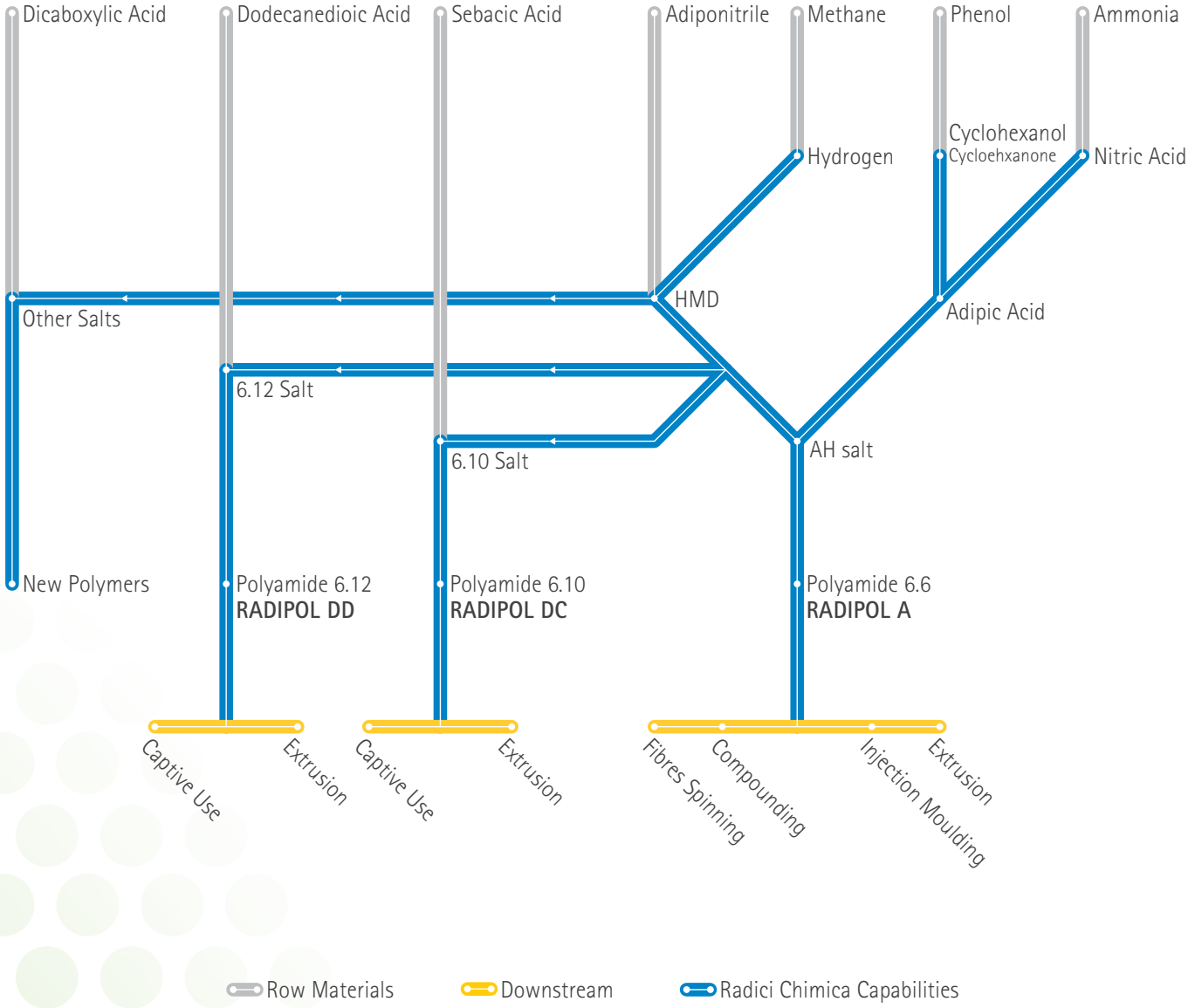
Radici Chimica offers a wide range of polyamides designed for the extrusion of single and multi-strand monofilament for specific applications.

In the monofilament market, the goal is the continuous development of custom-made solutions. After a careful analysis of customer needs, Radici Chimica translates these requirements into critical polymer characteristics.

Radici Chimica always offers optimal solutions in line with market needs.
Among its polymers for monofilament, in addition to RADIPOL® A, polyamide 6.6, Radici Chimica has developed a complete line of long chain polyamides:
RADIPOL® DC, polyamide 6.10, and RADIPOL® DD, polyamide 6.12.
RADIPOL® DC is a bio-based product, partially derived from renewable sources, i.e. ricinus oil.

SYNERGY AND INTEGRATION

An integrated production chain, this is one of the crucial elements of RadiciGroup competitiveness.



RADIPOL® A

PA 6.6 grades offer:

- Excellent mechanical properties;
- High operating temperatures;
- Excellent resistance to chemical agents and oil;
- High abrasion resistance, especially for the medium and high molecular weight grades;
- Low fuel permeability.

Radici Chimica offers different viscosity grades for the manufacturing of monofilament with different diameters (usually from 0.09 to 0.25 mm), as well as a heat and light-stabilized high-viscosity grade suitable for highly technical applications, such as air bag and tire cord yarn.

Typical Applications: technical fibres, air bags, ropes, tire cord, hook and loop fasteners, filtration fabrics, industrial brushes.

RADIPOL® DC

PA 6.10 grades offer:

- Low moisture absorption, with values similar to traditional polyamides, such as PA 11 and PA 12;
- Dimensional stability in humid conditions;
- Excellent hydrolysis resistance;
- Superior peroxide resistance;
- Excellent elastic memory, better than traditional polyamides, which means higher bending resistance;
- Higher toughness and flexibility even at low temperatures;
- High dirt resistance;
- Bio-based origin, partially derived from renewable sources;
- Suitability for wet applications.

Radici Chimica guarantees the performance stability and durability of its bio-based grades, as its raw material procurement process control is fully integrated with the product development process and critical process parameters are carefully controlled. **Typical Applications:** Press felts, PMC sewing thread, dental care, filtration fabrics, industrial brushes.

RADIPOL® DD

PA 6.12 grades offer:

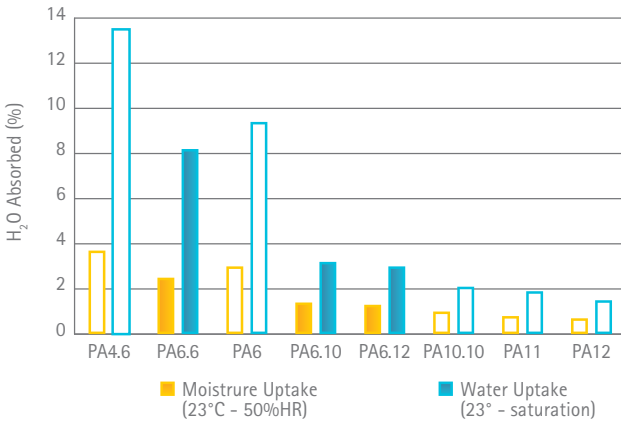
- Lower moisture absorption, with values similar to PA 11 and PA 12;
- Chemical resistance similar to PA12;
- Dimensional stability in humid conditions;
- Excellent hydrolysis resistance;
- Superior peroxide resistance;
- Excellent elastic memory, superior to traditional polyamides, which means higher bending.

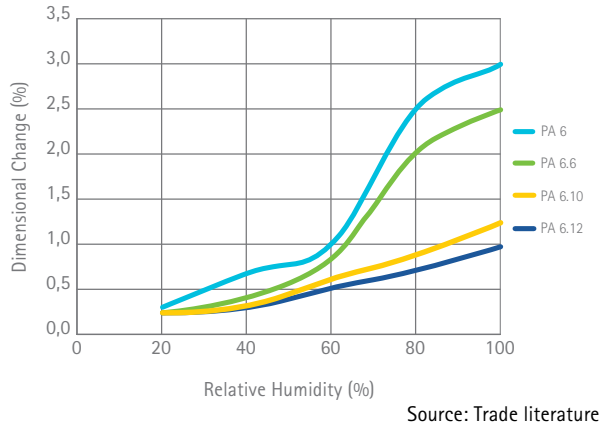
Typical applications: dental care and toothbrushes, cosmetic application, industrial brushes, paper machine clothing, filtration fabrics, Industrial brushes.

NYLON CHARACTERISTICS

Water uptake

This is a typical characteristic of polyamide polymers and depends on frequency of amide group in the polymer chain. Water absorption causes change in dimension of components (the variation depends in part on thickness and processing conditions). This behaviour is more pronounced in polyamide with high frequency of amide group in polymer chain, like PA6 and PA6,6, and less in polyamide with lower frequency of amide group such as PA6,10 or PA6,12.





Source: Trade literature

Abrasion

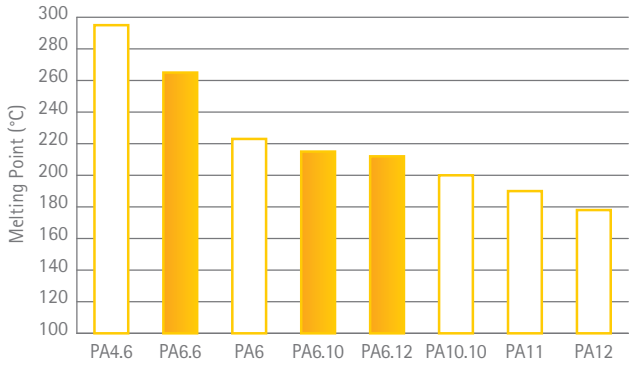
Nylon has excellent resistance to abrasion, and thus to wear. Polyamides with higher molecular weights have better abrasion resistance; polyamide 6.6 is the best among the polyamides currently on the market.

TABER ABRASION OF NYLONS					
Polyamide type	PA 6	PA 6.6 standard viscosity	PA 6.6 high viscosity	PA 610	PA 12
mg loss/1000 cycles	5	7	4	5	5

Source: Trade literature

Melting point

The melting point of linear nylon varies in proportion to the amide group concentration. PA 6.10 is an excellent compromise in terms of melting point and chemical resistance.



Source: Trade literature

RADIPOL® A

Available grades - General properties

Properties	Method	Test Conditions	Units	Radipol® A45	Radipol® A75	Radipol® A95	Radipol® A75K02
Viscosity range				2.60÷2.75	3.10÷3.40	3.10÷3.40	3÷3.40
Physical Properties							
Density	ISO1183		kg/dm3	1.14	1.14	1.14	1.14
Water absortion	ISO62	23°C Saturation	%	8	8	8	8
		23°C 50% r. u.	%	3	3	3	3
Mechanical Properties							
Tensile modulus	ISO 527-2/1A	DAM; vel. test 1mm/min	MPa	3200	3000	2900	3000
Yield stress	ISO 527-2/1A	DAM; vel. test 5mm/min	MPa	80	80	90	80
Yield strain	ISO 527-2/1A	DAM; vel. test 5mm/min	%	4,4	4,4	4	4
Nominal strain at break	ISO 527-2/1A	DAM; vel. test 50mm/min	%	40	61	50	62
Flexural modulus	ISO 178/1A	DAM; vel. test 2mm/min	MPa	2650	2700	2980	2700
Flexural strength	ISO 178/1A	DAM; vel. test 2mm/min	MPa	110	110	105	110
Charpy impact strength	ISO 179 eU	DAM; T=23°C	KJ/m2	NB	NB	NB	NB
Charpy notched impact strength	ISO 179 eA	DAM; T=23°C	KJ/m2	5	5,5	8	5,5
Thermal Properties							
Melting temperature	ISO 11357-1-3	Heating rate 10°C/min	°C	262	262	262	262

RADIPOL® DC

Available grades - General properties

Properties	Method	Test conditions	Units	Radipol® DC45D	Radipol® DC75	Radipol® DC95
Viscosity range				2.55÷2.75	3÷3.40	3.70÷4.10
Physical Properties						
Density	ISO1183		Kg/dm3	1,08	1,08	1,08
Water absortion	ISO62	23°C Saturation	%	3.2	3.2	3.2
		23°C 50% r. u.	%	1.4	1.4	1.4
Mechanical Properties						
Tensile modulus	ISO 527-2/1A	DAM; vel. test 1mm/min	MPa	2200	2200	2200
Yield stress	ISO 527-2/1A	DAM; vel. test 5mm/min	MPa	63	65	66
Yield strain	ISO 527-2/1A	DAM; vel. test 5mm/min	%	4,8	4,5	4,4
Nominal strain at break	ISO 527-2/1A	DAM; vel. test 50mm/min	%	78	60	40
Flexural modulus	ISO 178/1A	DAM; vel. test 2mm/min	MPa	2060	2000	1960
Flexural strength	ISO 178/1A	DAM; vel. test 2mm/min	MPa	83	83	83
Charpy impact strength	ISO 179 eU	DAM; T=23°C	KJ/m2	NB	NB	NB
Charpy notched impact strength	ISO 179 eA	DAM; T=23°C	KJ/m2	6,5	7	7,4
Thermal Properties						
Melting temperature	ISO 11357-1-3	Heating rate 10°C/min	°C	222	222	222

RADIPOL® DD

Available grades - General properties

Properties	Method	Test conditions	Units	Radipol® DD45D	Radipol® DD75	Radipol® DD95
Viscosity range				2.50÷2.70	3÷3.40	3.70÷4.10
Physical Properties						
Density	ISO1183		Kg/dm3	1.06	1.06	1.06
Water absorpition	ISO62	23°Csaturation	%	2.6	2.6	2.6
		23°C 50% r. u.	%	1	1	1
Mechanical Properties						
Tensile modulus	ISO 527-2/1A	DAM; vel. test 1mm/min	MPa	2315	2300	2230
Yield stress	ISO 527-2/1A	DAM; vel. test 5mm/min	MPa	58	60	60
Yield strain	ISO 527-2/1A	DAM; vel. test 5mm/min	%	5	4	4.2
Nominal strain at break	ISO 527-2/1A	DAM; vel. test 50mm/min	%	>100	>100	45
Flexural modulus	ISO 178/1A	DAM; vel. test 2mm/min	MPa	2415	2320	2220
Flexural strength	ISO 178/1A	DAM; vel. test 2mm/min	MPa	87	85	81
Charpy impact strength	ISO 179 eU	DAM; T=23°C	KJ/m2	NB	NB	NB
Charpy notched impact strength	ISO 179 eA	DAM; T=23°C	KJ/m2	4	5	6
Thermal Properties						
Melting temperature	ISO 11357-1-3	Heating rate 10°C/min	°C	215	215	215

RADICI CHIMICA SpA
Production of: PA6.6 polymers (Radipol®), adipic and nitric acid, Hexamethylenediamine 6.6 salt, dicarboxylic acids mixture -AGS-, dicarboxylic acid esters (Radichem®).

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