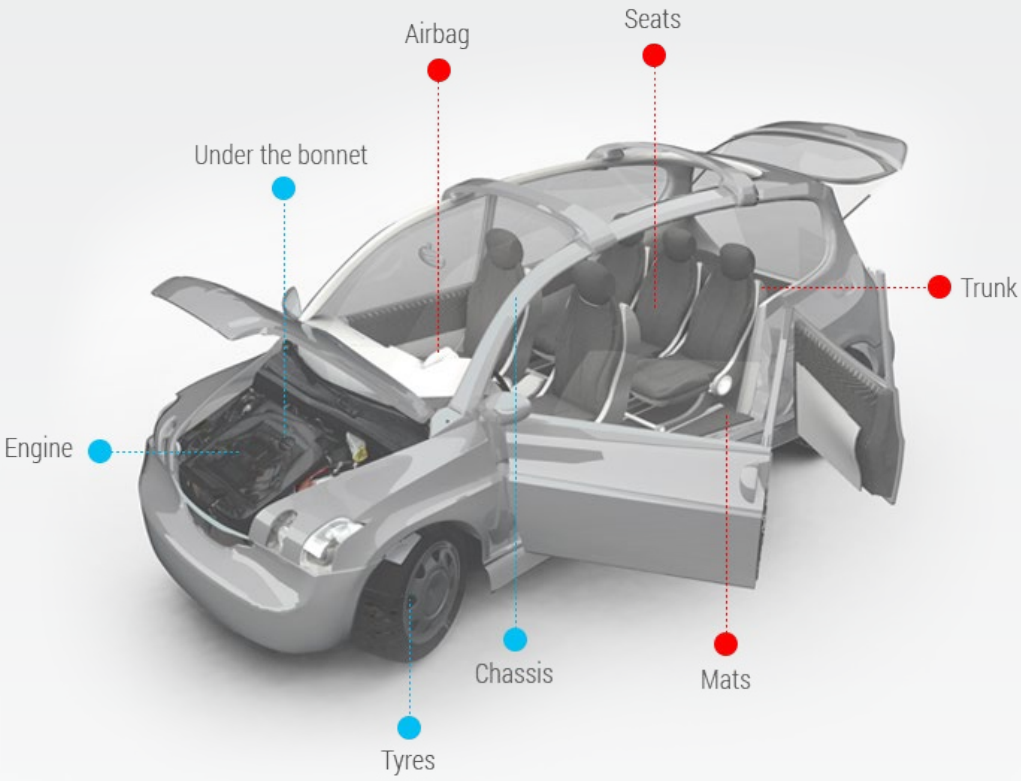
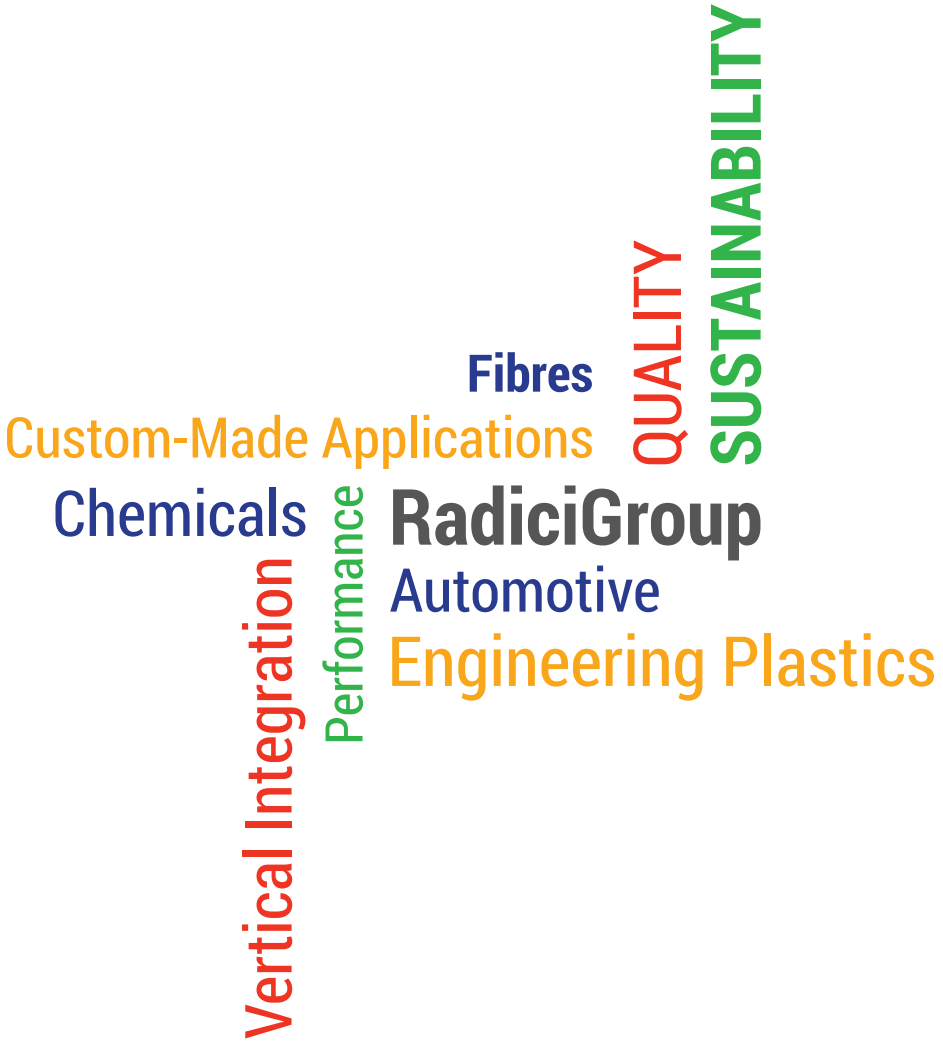
RADICIGROUP
IN THE AUTOMOTIVE WORLD





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RADICIGROUP

RadiciGroup Profile

RadiciGroup is one of the most active Italian chemicals companies at an international level. The Group fully controls its production chain, from adipic acid and PA6 and 6,6, to engineering plastics.

RadiciGroup's diversified businesses operate worldwide and are focused on **Chemicals, Plastics, Synthetic Fibres and Nonwovens.**

One of RadiciGroup's key strengths is the synergistic vertical integration of its polyamide chain. The Group has total control over its production chain, from chemical intermediates, such as **adipic acid** and **polyamide 6** and **polyamide 6.6**, to **engineering plastics** and **synthetic yarn.**

Attention to our customers' requirements, the desire to foresee their needs, to supply them with quality, made-to-measure products, as well as efficiency of processes, products and services.
These are RadiciGroup's winning strategies along with new technologies and innovative systems which improve safety and environmental protection.

RadiciGroup's products are exported all over the world, and are the starting -point for developments in the clothing, sport, furnishings, automotive, electrical/electronic and appliances sectors.

RadiciGroup - with its Chemicals, Plastics and Synthetic Fibres Business Areas - belongs to a wider industrial group which includes also companies operating in the textile machinery and energy production sectors.

RadiciGroup Vision, Mission and Values

RadiciGroup has always been committed to balanced growth, better quality of life and a harmonious relationship between the individual and the environment.

VISION

- To be one of the leading chemical groups in the polyamide, synthetic fibres and engineering plastics production chain.

MISSION

- To promote the development of our businesses while pursuing our Group values and culture.
- To pursue our vision by valorising and optimizing our resources, establishing strategic alliances and searching for new markets, including niche markets.
- To embed sustainability into new product and application development.

VALUES

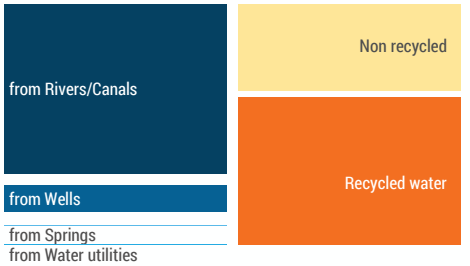
- Putting people at the centre of everything we do, respecting their right to physical and cultural integrity.
- Efficiency and effectiveness of our management systems to improve our business.
- Fairness and transparency of our management systems to comply with all applicable laws and regulations.
- Attention to the needs and expectations of our stakeholders in order to create a feeling of belonging and satisfaction.
- Reliability of our management and operating systems to ensure the safety of our employees, our community and the environment.
- Our responsibility as a company for our workers, production sites and communities.

RadiciGroup for Sustainability

OUR VISION INCLUDES SUSTAINABILITY APPROACH TO ALL OUR ACTIVITIES

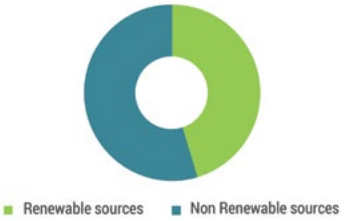
SOME OF OUR PERFORMANCE INDICATORS...

USE OF WATER (m^3)



63%
Water savings

ELECTRIC ENERGY CONSUMPTION (GJ)

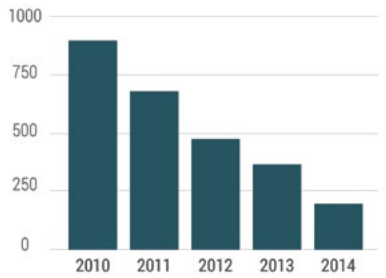


RadiciGroup
45.3%
Renewable sources used

Data source: RADICIGROUP SUSTAINABILITY REPORT 2014 – www.radicigroup.com

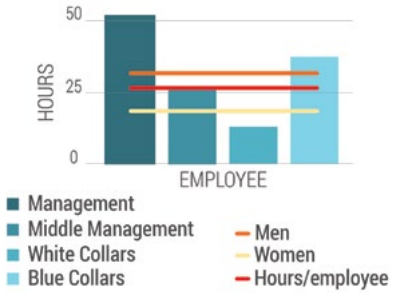
SOME OF OUR PERFORMANCE INDICATORS...

DIRECT EMISSIONS
(t CO_2eq/1000)



-78%
Direct emissions
Over 5 years

TOTAL HOUR OF TRAINING
Hours/employee



12,415
total hours
of training

Data source: RADICIGROUP SUSTAINABILITY REPORT 2014 – www.radicigroup.com

RADICIGROUP FOR SUSTAINABILITY.
OUR CONTRIBUTION TO ECO-DESIGN WITH EPD

- **ECO-DESIGN is the main driver** for the growing demand of reliable information on environmental impact of products
- **Environmental Product Declaration (EPD)** is the reference model chosen by RadiciGroup to ensure that accountable, certified and specific data are provided to customers
- **RadiciGroup R&D** takes into account the technical performance as well as the **environmental performance** of our compounds already at the early stage of development
- We can select the formulation with **lower impact**, and directly release its **certified EPD**

We can support our partners in the selection of the best solution with respect to:

- RECYCLABILITY
- TECHNICAL PERFORMANCE
- ENVIRONMENTAL IMPACT

ENVIRONMENTAL ACCOUNTING OF PRODUCTS.
KEY WORDS: LCA, PCR AND EPD

LCA
Life Cycle Assessment

EPD
Environmental
Product Declaration

PCR
Product
Category Rules

RADILON® S (PA6)
RADILON® A (PA6.6)

HERAMID®
A NER GF030/1

www.environdec.com EPD®

Awareness Cooperation/Dialogue Training Measurement R&D Investment Commitment Transparency Ambition Leadership VISION

RadiciGroup Plastics

Founded in 1981 in Italy on the cornerstone of RadiciGroup's polyamide upstream integration, **RadiciGroup Plastics** has grown into a **global manufacturer** of a complete range of engineering plastics to meet the needs of many industries including automotive, electrical & electronics, furnishing, consumer goods.

WE ARE GLOCAL: GLOBAL THINKING, LOCAL ACTION.

This has been our motto for the last 20 years' growth. Today, with six plants strategically located in **3 continents and 5 countries**, and a world-wide sales network, **RadiciGroup Plastics** provides high-quality product standards on a global scale, besides offering state-of-the-art support in research & development and processing technologies. RadiciGroup's **Upstream integration** in polyamide, coupled with the high flexibility of its polymerization plants has represented the basis for the continuous expansion of our polyamide-based product range, from long chain to high temperature polyamides. **Expansion** is a keyword for our future. We keep exploring new horizons, by expanding our product range and global presence, to promote the growth of **RadiciGroup Plastics**.

RADICIGROUP PLASTICS WORLDWIDE PRESENCE

RADICIGROUP PLASTICS FACTS AND VISION

FACTS

Upstream integration of PA6, PA6.6, PA6.10, PA6.12, High Temperature PA and copolymers

Complete range of materials available in all countries

Competent global application development support

VISION

Growth through **innovation**, with a focus on speciality polyamide grades.

Sustainability commitment along the entire production chain.

Worldwide industrial and sales network

No Greenwashing: various environmental certificates issued to Radici Novacips prove company's constant commitment to monitoring environmental impact of its products

RADICIGROUP PLASTICS FOCUS ON INNOVATION AND SUSTAINABILITY

NEW GRADES WITH ENHANCED PERFORMANCE

METAL REPLACEMENT

- Special Radilon® PA6.6-GF and high-flow Radilon® PA6-GF grades with enhanced mechanical performance designed for metal replacement.
- A new family of Radistrong® long fibers polyamides that offer exceptional impact resistance, superior creep & fatigue properties.

LONG CHAIN PA

- A family of Radilon® D PA6.10 bio-based materials developed for pneumatic and brake air lines and fuel connectors; offers excellent hydrolysis resistance.
- A new family of Radilon® DT PA6.12 long chain polyamides that offer enhanced chemical resistance even in contact with CaCl2 and ZnCl2 salts solutions.

HIGH HEAT RESISTANCE

- Radilon® HHR (High Heat Resistant) PA6.6 for use in continuous contact with hot air up to 210°C.
- A new family of Radilon® XTreme special polyamides that offer superior heat resistance up to 230 °C in continuous contact with hot air.

EXCELLENCE AND KNOW-HOW IN ENGINEERING PLASTICS

RADILON — PA6, PA6.6, PA6.10, PA6.12 and High Temperature PA	RADITER — PBT and PET
RADISTRONG — Long Fiber Reinforced Polyamides	RADIFLAM — PA6, PA6.6, and PBT Flame Retardants
HERAMID — PA6, PA6.6	HERAFLEX — TPEs
HERAFORM — POM	

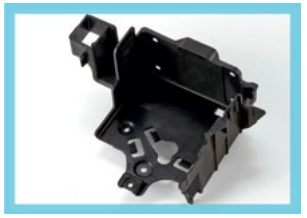
Solutions for Metal Replacement

A WIDE PORTFOLIO
DESIGN FOR SPECIFIC FUNCTIONAL NEEDS

- Focus on mechanical properties and welding line resistance: PA66 based Radilon® RW
- Focus on Impact, fatigue and creep resistance: long glass fibres PA66 & PA6 Radistrong® LGF
- Focus on stiffness and productivity: high flow, high filler content PA6 Radilon® URV
- Focus on superior strength at break, stiffness and surface quality: PA based Radistrong® A

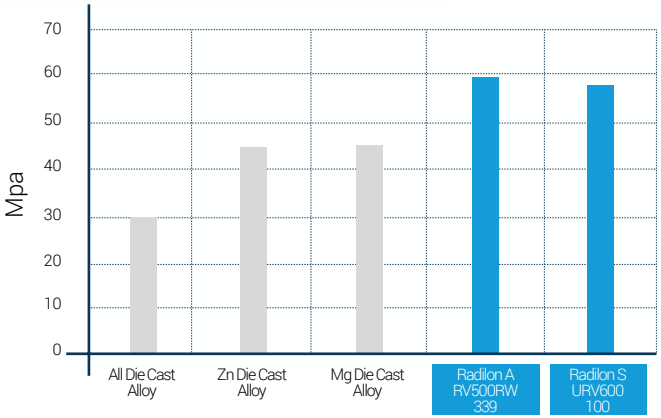
ENGINE BRACKET
RADILON® A RV500RW

BATTERY SUPPORT
RADILON® A RV500W



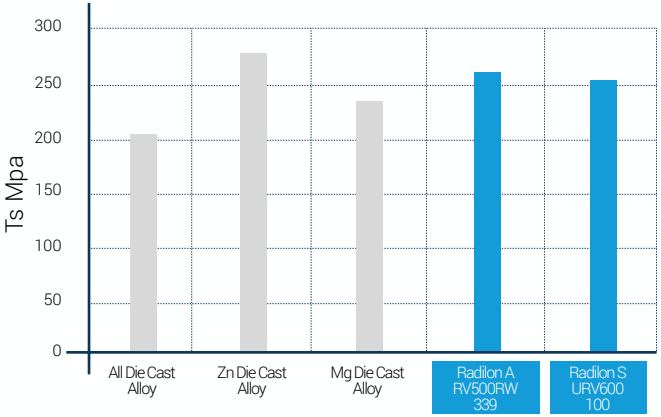
PEDALS SUPPORT
RADISTRONG® A LGF60W

TENSILE FATIGUE LIMIT AT 7 MILLION CYCLES



Structural Polyamides show better fatigue behaviour than light metal alloys.

TENSILE STRENGTH AT BREAK



Structural Polyamides show comparable tensile strength at break similar to that of light metal alloys.

ENHANCED METAL REPLACEMENT GRADES KEY FEATURES

- Lower part cost compared to metal
- Weight reduction
- Corrosion free
- Superior mechanical properties compared to standard grades
- Design data available (short and long term properites)

Radistrong® A

Radistrong® A X15150 BK (PA-GF50)
Radistrong® A X7957 BK (PA-GF60)

Key Features

Superior tensile strength at break
Lower Moisture sensitivity
Improved surface aspect

Radistrong® LGF (Long Glass Fibres)

Radistrong® A LGF50W (PA66-LGF50)
Radistrong® A LGF60W (PA66-LGF60)
Radistrong® S LGF60W (PA6-LGF50)
Radistrong® S LGF60W (PA66-LGF60)

Key Features

Superior creep,
fatigue and impact resistance

RADICI PLASTICS Solutions for Metal Replacement

Radilon®ARW

Radilon® A RV500RW (PA66-GF50)
Radilon® A RV350RW BK (PA66-GF35)

Key Features

Better tensile strenght at break vs standard materials
Impovered walding lines resistance
Engine mounts & engine bracket grades

Radilon® S URV (High flow PA6)

Radilon® S UV500W (PA6-GF50)
Radilon® S UV600W (PA6-GF60)

Key Features

Good mechanical properties
Productivity & lower screws and tools abrasion

Materials for high temperature applications

Radilon® HHR – PA66 based, contains special additives that inhibit the thermal oxidative process. Suitable for continous service temperature of up to 210 °C in air.

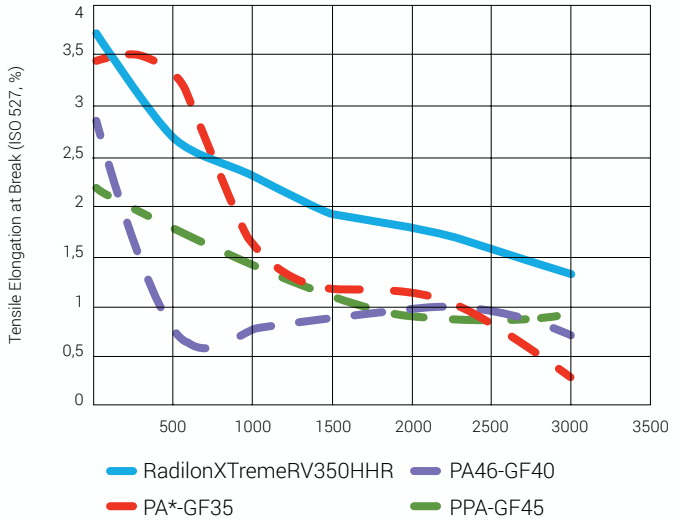
Radilon® XTreme - PA based, contains a semi-aromatic component that, in combination with the additives used against thermo-oxidation, further raises the continuous service temperature up to 230 °C in air.

TURBO DUCT RESONATOR
RADILON® A RV350HHR

HOT SIDE TURBO AIR DUCT
RADILON® XTREME
BMV150HHR

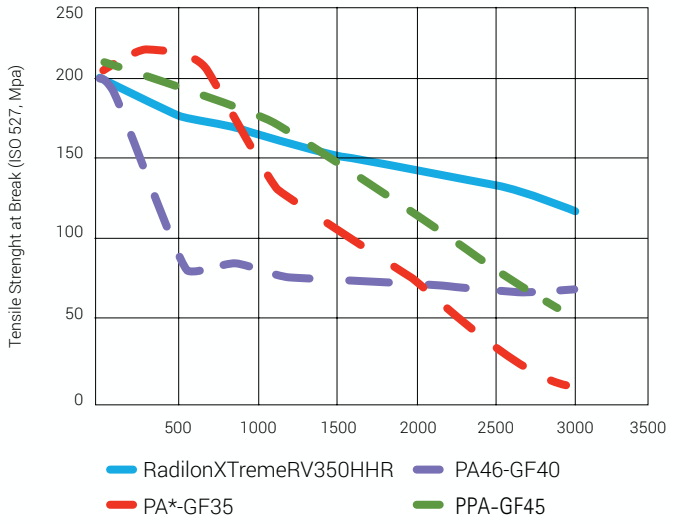
ENGINE COVER
RADISTRONG® A RV150HHR AF (FR)

HEAT AGEING IN AIR AT 220° C



After 3000 hours of exposure at 220° C, Radilon® XTreme RV350HHR has a residual tensile elongation at break of 1,35% higher than the benchmark PAs.

HEAT AGEING IN AIR AT 220° C

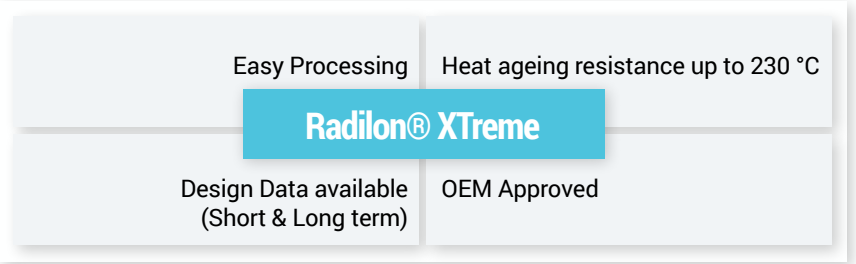


After 3000 hours of exposure at 220° C, Radilon® XTreme RV350 HHR has a tensile strength at break of 115 MPa, higher than all the benchmark PAs.

RADILON® XTREME HIGH TEMPERATURE POLYAMIDE KEY FEATURES

Property	PA66	PA6	XTREME	PPS	PPA	PPA-2	PA46	PA46-2
Melting Temperature	260	220	280	280	308	300	282	295
Water absorption	8,5	9,0	7,0	0,1	7,1	7,0	13,0	13,0
Tg	70	60	90	90	110	120	70	70
Density	1,14	1,14	1,15	1,35	1,15	1,15	1,18	1,18

Properties indicated in the table refer to Radilon® XTreme pure polymer.



- Same melting temperature of PPS and PA46, lower than PPA
- Same water absorption of PPA, lower than PA46
- Same TG of PPS, higher than PA46, lower than PPA
- Lower density versus PPS and PA46
- Excellent properties retention after hot air exposure until 3000 h at 230 °C
- Easy to process: large processability windows in comparison to PPA, PA46, PPS. Tool temperature can be < 100 °C
- Welding line properties superior than PPA, same of PA66
- Excellent chemical resistance

RADILON® XTREME AVAILABLE GRADES

- Radilon® XTreme RV350HHR: superior heat resistant, PA-GF35, for injection
- Radilon® XTreme BMV150HHR 3800 BK: superior heat resistant PA66-GF15 for blow molding
- Radilon® XTreme RV500HHR: superior heat resistant, PA-GF50, for injection molding
- Radilon® XTreme RV150HHR: superior heat resistant, PA-GF15, for injection molding

Long chain high chemical resistance PA

TWO LONG MOLECULAR CHAIN POLYAMIDES FAMILIES

Radilon® D: partially bio-based PA6.10

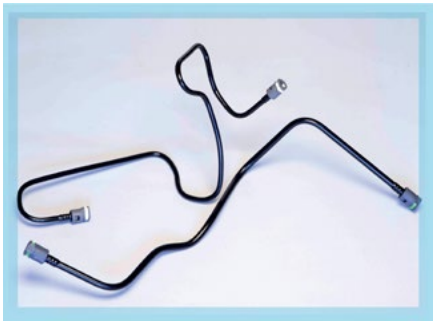
Radilon® DT: polyamide 6.12

AIR BRAKE HOSE FOR TRUCKS
Radilon® D 40EP25ZW

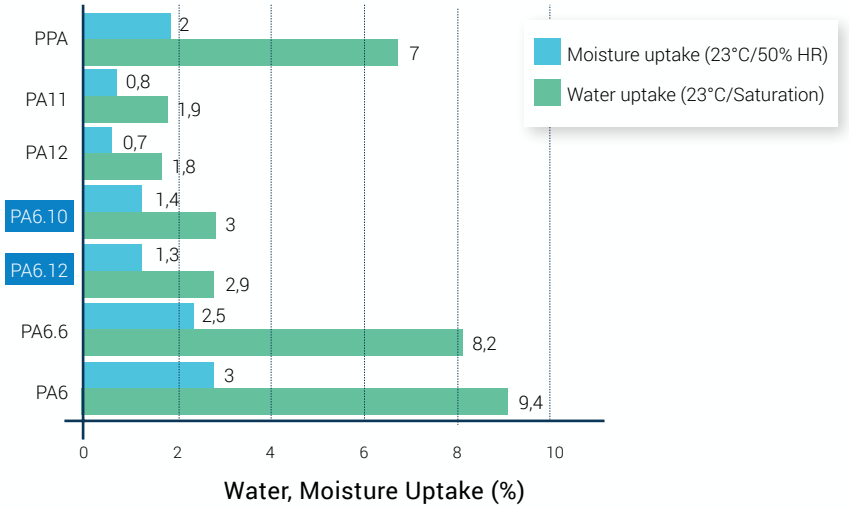
FUEL LINE CONNECTOR
Radilon® D ERV300W

FUEL VAPOUR CORRUGATED PIPE
Radilon® D 40EP25ZW

FUEL LINE
Radilon® DT 40EP75W

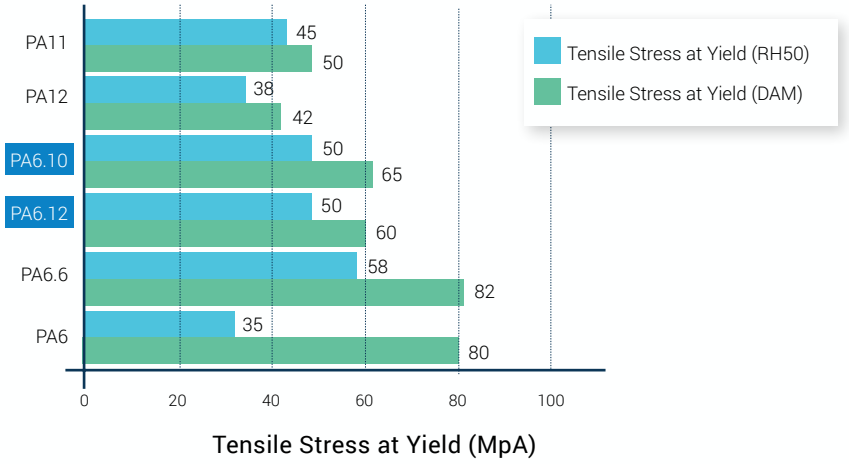


WATER AND MOISTURE UPTAKE COMPARISON (ISO 62)



PA6.10 and PA6.12 exhibit much lower hygroscopicity than PA6 and PA66, and their water uptake at saturation is not too far from PA12.

TENSILE STRESS AT YIELD (ISO 527)



PA6.10 and PA6.12 exhibit higher tensile stress at yield than PA11 and PA12 for both dry and conditioned test pieces. The graph also shows a smaller variation in properties values for PA6.10 and PA6.12 after water uptake, compared to PA6 and PA66.

FUEL SYSTEM MATERIALS MAIN REQUIREMENTS

- Chemical resistance
- Stress cracking resistance
- Dimensional stability
- Low fuel permeation
- Mechanical properties retention
- Thermal resistance

RADICI PLASTICS LONG MOLECULAR CHAIN PA KEY FEATURES

RADILON® D PA 6.10	Radilon® DT PA 6.12
Partially bio-based Good resistance to road salts	Excellent resistance to road salts (calcium and zinc chloride)

- Less moisture uptake compared to PA6 and PA66 and, consequently, greater dimensional stability
- Superior chemical resistance compared to PA6 & PA66
- Excellent resistance to motor and transmission oil
- Excellent hydrolysis resistance: clearly superior to PA66
- Enhanced thermal resistance compared to PA11 & PA12
- Higher tensile strength at break compared to PA11 & PA12
- Excellent resistance to fuels prolonged contact
- Low extractable substances compared to PA11 & PA12

radilon®
-Radyarn®-

RADICI GROUP

RadiciGroup yarns & fibres portfolio

RadiciGroup is a worlwide integrated leading manufacturer of a wide range of Polyester and Polyamide yarns and fibres used for several applications. Thanks to its diversification, technology and long lasting expertise, the Group is the best industrial partner for any new challenging textile project.



RADICI YARN is the Business Unit responsible for the production of Polyamide Yarns and Fibres. **RADICI YARN** can count on four production Units located in Italy, Germany and Romania. The product portfolio is fully diversified and thanks to its unique technology and flexibility, it is able to guarantee a product range suitable for every textile application from apparel to technical textiles, from floor covering to the automotive industry. The R&D department is fully committed to engineering new products and developing the most comprehensive range of highperformance PA-based yarns and fibres.

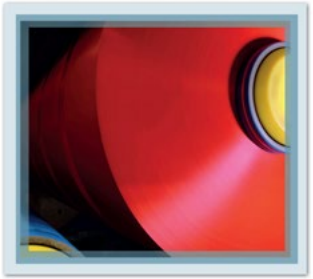
radilon®

dorix®

NOYFIL is a leading producer of Polyester Filament Yarns. **NOYFIL** can count on three manufacturing plants located in Italy and in Switzerland. We provide innovation and high-end products for a wide range of applications: from apparel to home textiles and contract furnishing, from technical applications (medical, filtration, institutional wear, outdoor...) to the automotive industry. Our R&D teams, our advanced technologies, our high flexibility and know-how provide customers with global textile solutions and high-performance PET, PBT, and PLAbased yarns around the world.

-Radyarn®

Starlight®



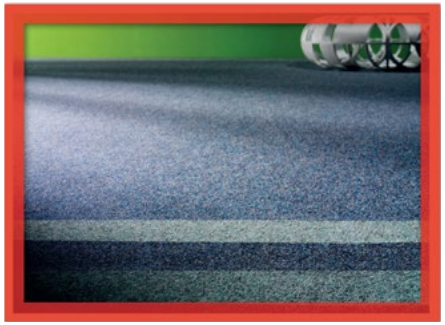
radilon®
-Radyarn®

RADICI GROUP

Polyamide yarns & fibres to improve performances

RADICI YARN is a European leading manufacturer of a wide range of polyamide-based yarns used for several applications such as apparel, sportswear, furnishings as well as technical, industrial and automotive textile sectors.

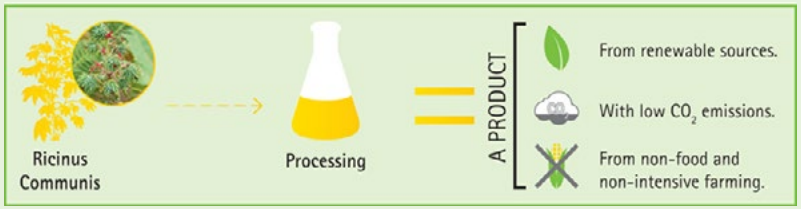
RadiciGroup staple fibre products are produced at RADICI YARN SpA site in Italy and at RADICI CHEMIEFASER GmbH in Germany, and are ideal for the textile floor covering industry, especially for the manufacture of needlefelt carpets for high performance applications where color fastness and resistance to wear and tear are strictly required.



THE NEW GENERATION...

RENEWABLE SOURCE AND HIGH PERFORMANCES!

Bio-based polyamide available in a wide range of counts and colors. It is the ideal solution for the textile coverings sector, particularly the manufacture of needlefelt carpet tiles for high performance applications.
Dimensional stability, better stain resistance and lower VOC emissions are just few of the most tangible benefits.



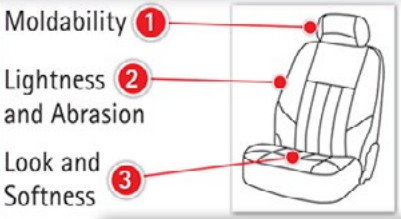
FOCUS ON INNOVATION

POLYAMIDE FIBRES

Can be used 100% or mixed with other fibres to enhance performances and achieve the best resilience and moldabilty of covering fabrics.

FEATURES: Resilience / Lightness / Moldability

SEAT COVERING

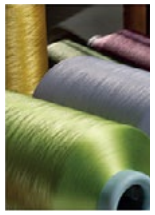


Full Recycling Concept

100% PA manufactured

POLYAMIDE YARNS

Can be used to provide several advantages like softness, look, comfort, lightness and moldability to seat covering fabrics.

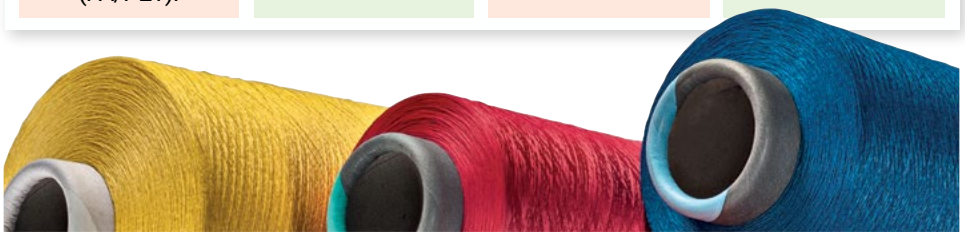


-Radyarn-

Polyester for Automotive

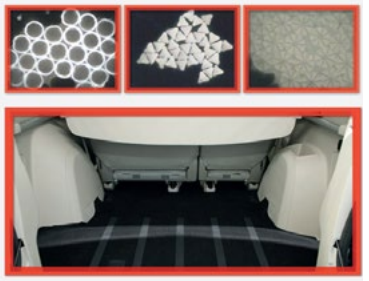
NOYFIL is part of the fibres area of RadiciGroup and a leading producer of Polyester Filament Yarns. We can count on three manufacturing plants located in Italy and Switzerland. We provide innovation and unique products for a wide range of applications: from apparel to home textiles and contract furnishing, from technical applications (medical, filtration, institutional wear, outdoor...) to the automotive industry.
Our R&D teams, our advanced tecnologies, our high flexibility and know-how provide customers with global textile solutions and high performance PET, PBT and PLA based yarns around the world.

-Radyarn-	r-Radyarn-	~~Starlight~~	~~r-Starlight~~
Raw-White and solution or yarn-dyed polyester available in additivated versions (Flame Retardant, Bacteriostatic, UV Protection), microfibre, supermicrofibre and bicomponent (PA/PET).	Continuous polyester filament derived from post-consumer recycled polymer available in dope - dyed, bacteriostatic and UV stabilized versions. A versatile product for a wide range of applications.	Raw and solution-dyed polyester yarn available in additivated versions (FR, Bacteriostatic, UV Protection) ideal for applications from apparel to furnishing, to medical and automotive sectors.	Eco-sustainable polyester yarn produced from postconsumer recycled PET bottles. A sustainable solution for a vast range of applications from apparel to technical/industrial sectors.



FOCUS ON

- Solution-dyed and Package-dyed Yarns
- Micro and Multi Filament Yarns
- Bicomponent Yarns
- Hollow Fibres
- Melange Yarns
- Flame Retardant Yarns
- High-UV Resistance Yarns



FOCUS ON

SUSTAINABILITY IN EVERYDAY LIFE

From PET bottle scraps to PET recycled polymer: a virtuos path for high performance yarns for a wide range of applications: from apparel to upholstery, from technical to industrial and automotive sectors.

Recycled PET from 100% Post Consumer Recycling

CornLeaf PLA Biopolymer

A bio-based polymer and a bio-based yarn. CornLeaf yarn is made from Ingeo™ polylactic acid (PLA), 100% natural biopolymer, derived from renewable sources.

RADICI GROUP For Sustainability

radilon® -Radyarn®-

Solution Dyeing... The best combination of Sustainability and Performances

RadiciGroup, as leading European manufacturer of Polyamide and Polyester yarns and fibres, is fully committed to Sustainability since several years.

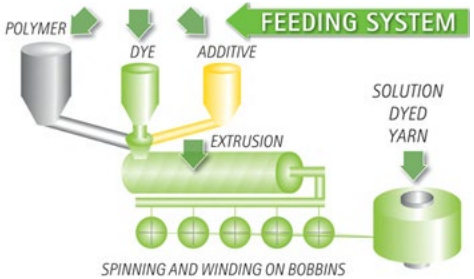
SUSTAINABILITY: OUR CHALLENGE

RadiciGroup believes that, in matters of environmental sustainability, innovation can only come from a rigorous and transparent approach. Starting from this conviction, the Group has put the systemic and rigorous measurement of not only environmental and economic performance indicators but also social indicators, product responsibility, human rights, labour practices and decent work, and society – at the centre of its action plan along its entire industrial production chain.

RADICI GROUP For Sustainability

SOLUTION DYED YARNS AND FIBRES...

Is the best compromise between Performances and Sustainability. Thanks to its unique technology and flexibility, RadiciGroup can offer a wide range of Polyester and Polyamide yarns & fibres in tailor-made colors for the automotive industry.



LCA STUDY-POLYESTER YARN

Key impact indicators for the production of polyester **standard Dyed** yarn and **Solution Dyed** yarn made by virgin polymer and post-consumer recycled polymer.

VALUE COMPARISON	STANDARD DYED YARN		SOLUTION DYED YARN	
	GER	GWP	GER	GWP
	MJ eq.	kg of CO_2 eq.	MJ eq.	kg of CO_2 eq.
r-Radyarn-	107	4.4	72	3.6
-Radyarn-	170	6.1	135	5.3

NOYFIL SA
It is the RadiciGroup specialist for the production of Solution Dyed Polyester yarns.
Thanks to its unique experience and ability, it is strictly committed to meet every new customer request with a wide range of polymer formulations.

RADICI CHEMIEFASER GmbH
It is the RadiciGroup company involved in the production of Staple Fibre Polyamide products.
Thanks to its great flexibility and long lasting experience, is able to meet every customer request as for color formulation, offering up to hundreds of tailor-made solutions.

A 50-year-long story in polyamide (nylon) polymers and yarns

RADICIFIL SPA, a company belonging to the Fibres Area of RadiciGroup, was founded in 1964 and celebrated its 50th anniversary last year.
A 50-year-long experience in the production of polyamide 6 polymers for spinning, engineering plastics and film destined to food packaging and industrial applications. A 50-year-long experience in the spinning of polyamide 6 and 6.6 yarns too, at first destined to textile applications and then to the carpet flooring of houses, offices, hotels, cruise ships and cars.
As for the automotive sector Radicifil is also a leading manufacturer of polyamide 6.6 yarns destined to airbags and tyre reinforcement materials.

An overall control of the production chain, modern plants and advanced technologies allow **RADICIFIL** to manufacture top quality and high performance products aimed at the most demanding applications in home interiors and the automotive market all over the world.
RADICIFIL can boast UNI EN ISO 9001:2008 quality system certification as for the designing, producing and selling of its full range of PA6 and PA6.6 based products marketed under the trade names Radifloor®, Raditeck® and Radipol®.

In 2012 **RADICIFIL** also obtained OHSAS 18001:2007 occupational health and safety international certification, in 2013 UNI EN ISO 14001:2004 environmental certification while in 2015 the company achieved UNI EN ISO 50001:2011 energy system certification.

Radifloor® Automotive

Radifloor® Automotive is polyamide 6 solution dyed BCF yarn destined to carpet makers in the automotive world, i.e., yarn for flooring trunk liners and formats.

Available in a dedicated range of counts and colours tailored to meet specific OEM requirements, these yarns are the direct result of Radicifil long experience in developing solution dyed yarns with excellent characteristics of colour fastness and abrasion resistance.

Radifloor® Automotive portfolio include the leading edge yarn, low dpf, 1.020 dtex with 128 filaments capable to fulfill the lightweighting process of cars interiors while maintaining superior uniformity, better colour fastness and guaranteeing an excellent look to the main thermoformed flooring applications.

Radifloor® Automotive

		Nominal count filament	Dpf	Dye affinity
AUTOMOTIVE	PA6	1020f128	7.8	solution dyed
	PA6	1300f68	19.1	solution dyed
	PA6	1300f84	15.5	solution dyed
	PA6	1300f128	10.2	solution dyed
	PA6	1450f68	21.3	solution dyed

High tenacity for everyday safety

PA6.6 high-tenacity yarn available as Raditeck® DoubleSix, Raditeck® Fine and Raditeck® DYNA.

Raditeck® DoubleSix

Owing to its performance characteristics, this line of PA6.6 high-tenacity yarns is ideal for applications in the automotive industry: airbag fabric, tyre cord, transmission belts, hydraulic hoses and manufactured reinforced goods for other technical applications.

raditeck® FIBRES INDUSTRIAL DoubleSix

- **Raditeck®** high tenacity yarns are produced at **RADICIFIL** with:
  - Self Owned Spinning Technology.
  - Single step process.
  - Proprietary Polymer Formulation by RADICI CHIMICA.

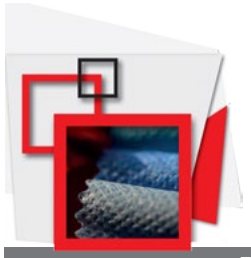
Raditeck® highlights

- Self Owned Spinning Technology.
- Single step process.
- Proprietary Polymer Formulation by RADICI CHIMICA.

AIRBAG

BRIGHT, INTERMINGLED YARNS

Yarn Type Code	Description	Linear Density (Dtex)	Tenacity (cN/Dtex)	Elongation at break (%)	Hot air shrinkage at 190° C 3 min (%)	Knots (No/m)
Raditeck® DoubleSix 301	470 dtex F 140 HT	470	7.4	18.5	6.8	25
Raditeck® DoubleSix 302	700 dtex F 104 SHT	700	8.2	18.5	6.0	25
Raditeck® DoubleSix 305	580 dtex F 140 SHT	580	8.2	18.8	6.1	25



DYLAR

RADICI GROUP

Polypropylene spunbond nonwovens

TESSITURE PIETRO RADICI (TPR) is the ancestral company of today's Radici-Group. TPR has been in operation since 1941. Since the end of the 1980's, it has produced the Dylar® line of spunbond nonwovens which are specifically designed and developed for needs of various application sectors.

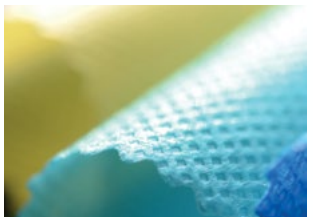
TPR is member of the European Association for the Nonwovens industry EDANA.

edana

BRAND

DYLAR

Dylar® is the brand name for polypropylene spunbond nonwovens manufactured by TPR. The Dylar® family includes a complete range of products offering a wide choice of weights, widths and additives.



MARKETS

AUTOMOTIVE
Dylar® Thermoresistant
Dylar® Low VOC emissions

HYGIENE & MEDICAL
Dylar® Super Absorbent
Dylar® Soft (PE)

FILTRATION
Dylar® Elongation
Dylar® Air Permeability

AGRICULTURE
Dylar® UV High Resistance at low weight
Dylar® Pesticides Resistant
Dylar® Super Absorbent
Dylar® Soft (PE)

PROTECTING APPAREL
Dylar® Antistatic
Dylar® Tear Resistant
Dylar® High Tech Puncture Resistant

ROOFING
Dylar® UV Resistant
Dylar® Electroshield
Dylar® Flame Retardant
Dylar® High color fastness
Antimosquitos & Mold

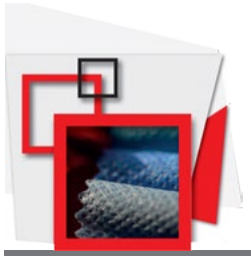
FURNITURE
Dylar® Antibacterical
Dylar® Antistatic
Dylar® Food Approval (EU Standard)

Dylar® Spunbond Process Certifications

UNI EN ISO 9001

UNI EN ISO 14001

OHSAS 18001



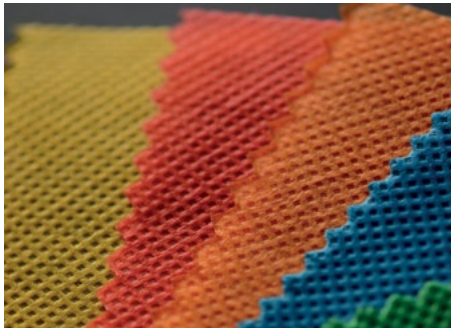
DYLAR

RADICI GROUP

Polypropylene spunbond nonwovens for Automotive

TESSITURE PIETRO RADICI (TPR) is a well known European manufacturer of polypropylene spunbond nonwovens for technical applications such as roofing membranes, automotive interior and exterior, furniture, packaging and agriculture.

DYLAR® spunbond is a nonwoven fabric that is comprised of filaments arranged in a random manner and thermally bonded using a calendering process.
DYLAR® spunbond is available in weights from 12 to 150 gr/m2 and in a wide range of colours and tailor made technical properties.



FOCUS ON INNOVATION

The automotive industry is one of the largest users of "engineered non-woven fabrics". Nonwovens cover approximately 3,7 sqm per vehicle, very often in non visible parts. This is a very demanding industry that requires: new materials, different technical usages, low cost and performing solutions.

STRENGHTS

- Lightweight
- Good structural / engineering properties
- Versatility
- High mechanical characteristics over time

FOCUS ON INNOVATION

AUTOMOTIVE INTERIOR

DYLAR® FEATURES

- High Tensile strength
- Functionality at hot, cold and humid conditions
- Good Folding behavior

AIRBAG ENVELOPE

SEAT SPRING COVER

DYLAR® FEATURES

- Lightweight and strong
- Functionality at hot, cold and humid conditions
- High Tensile strength

SEAT COVER

DYLAR® FEATURES

- High Tensile strength
- Lightweight and strong
- Hydrophobic

AUTOMOTIVE EXTERIOR

INSULATION ACOUSTIC CONTROL

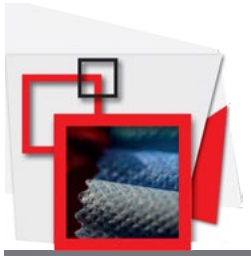
DYLAR® FEATURES

- Readily sewn, seamed, coated, dyed and laminated
- Lightweight and strong
- Functionality at hot, cold and humid conditions

CAR COVER

DYLAR® FEATURES

- High Tensile strength
- UV resistance properties
- Wide range of colours



DYLAR

RADICI GROUP

Polypropylene spunbond nonwovens specialties

High Technical Properties

Tensile Strength is the maximum stress that a material can withstand while being stretched or pulled before failing or breaking.

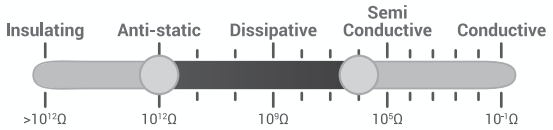
Isotropy is uniformity in all orientations, both Cross Direction (CD) and Machine Direction (MD).
In standard spunbond PP nonwovens MD > CD

DYLAR® PP spunbond performance can reach: MD/CD=1

Antistatic

DYLAR® PP spunbond AS prevents or inhibits the buildup of static electricity.

As requested by the different application sectors, **DYLAR® PP spunbond AS** can either be:
Anti-Static (Dylar® surface resistance 1x1012 ohms/square)
Dissipative (Dylar® surface resistance 1x106 ohms/square)



Flame retardant

DYLAR® Flame Retardant PP spunbond can prevent fires from starting or limit the spread of fire and minimize fire damage.

DIN 75200 (AUTOMOTIVE)
Determination of burning behaviour of interior materials in motor vehicles.

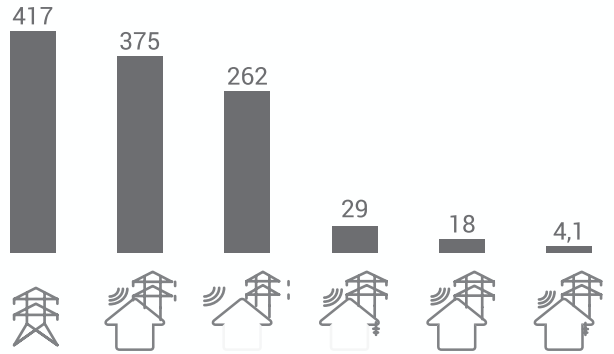
EN ISO 11925 (ROOFING/BUILDING)
Reaction to fire tests - Ignitability of building products subjected to direct impingement of flame.

FIRA International Ltd (FURNITURE)
Furniture Industry Research Association Certification: Schedule 4 Part II & Schedule 5 Part III.

Electroshields

DYLAR® PP Electroshields is a laminate, developed in customer partnership, whose main feature is the shielding that it provides against electric waves. Each of its constituent layers performs a specific function.

What does DYLAR® PP Electroshield do?



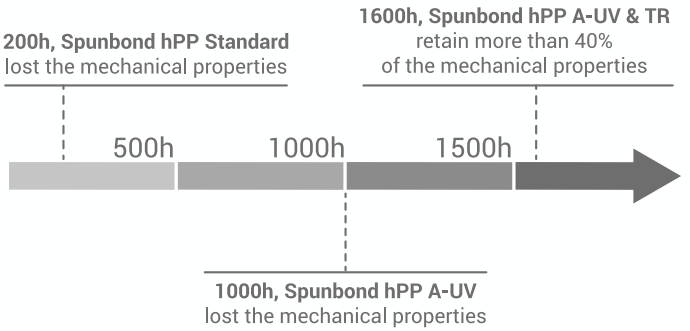
Electric field intensity *(V/m)

Electroshield is individually capable of abating up to 30% of field lines. When the product is properly grounded, a reduction of over 90% can be achieved.

A-UV

UV degradation occurs when nonwovens are exposed to the influence of sunlight, rain, temperature, and oxygen.

This type of degradation is caused primarly by the UV content of sunlight, which initiates the photo-oxidation process.



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