R.STAT/N fibres: security and comfort in textiles

Making material sufficiently conductive with the adding of antistatic/conductive fibres is the solution to neutralize static electricity.



The problem

Static electricity is generated at the surface of two substances when they are separated thus creating severe separation of positive and negative charges accumulated at their surface. It creates a wellknown "discharge", the degree of which is dependent on speed, pressure, moisture content and temperature.

This discharge creates a spark whose effects are:



- uncomfortable electrical shocks (when changing clothes, when getting out of the car, when holding a door knob after walking on a carpet...)
- electronic device malfunctions involving further maintenance costs (computers, on board flight electronic devices...)
- fires (in « dry material » environment such as paper pulp, sawmills...) and even explosions in explosive environments (grain silos, petrol stations, flour mills, industries...)

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Copper sulphide (Cu₂S)



Polyamide + Copper sulphide

The solution

Polyamide fibres are made conductive thanks to a thin layer of metallic salt (copper sulphide) suffused onto the polymer. This thin layer (0.2µ) does not modify the textile characteristic of original polymer.

Linear electrical conductivity (in Ω /cm):

Stainless steel fibres			es	Metal p	olated es	R.STAT/N Embedded or dispersed carbon fibres							
 10 ⁻⁶	 10 ⁻⁴	10 ⁻²	 1	10 ²	10 ⁴	10°	10 ⁸	1010	10 ¹²	10 ¹⁴	10 ¹⁶	10 ¹⁸	

6.7 dtex R.STAT/N cut staple fibre has a linear conductivity of +/- $10^{5} \Omega/cm$.

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R.STAT/N product range

R.STAT/N fibres should be blended at a low rate that will be determined according to the construction of the textile material, according to its conditions of process and use and to the degree of static protection level expected. When an antistatic/conductive continuous yarn is used, the rate of introduction does not matter more the way the antistatic/conductive yarn is introduced.

Examples of R.STAT/N product presentation (indicative):



Behaviour (indicative, only for fibre and not non guaranted for the finished product):

Treatment*	Retention of properties after:
Ageing	After 800 hours in an oven at 60°C and 70 % relative humidity
Abrasion	After 1000 rubs of a ceramic or steel rod under 1gr/dtex tension
Elongation	Until breaking
Washing	> 10 on fibre at 60°C with ECE detergent (normalized)
Dry cleaning	After 1 week in usual solvents (benzene, perchloretylene, methanol)
Temperature	Same as PA 6.6
Special care	Alkali pH are not suitable
	Oxydizing and bleaching agents are not suitable
	Washing powders including perborates are prohibited
	Repeated washings under strong conditions are not suitable

*treatment on fibre R.STAT/N 6.7 dtex

Applications



- aircraft blankets,
- industrial non-wovens,
- conveyor belts...

These examples are not exhaustive. Do not hesitate to inquire about your project and we'll find for you the most suitable solution.

Examples of products:

Composition	Product	Surface resistivity in Ω	Cross resistance in Ω				
98.5 % modacrylic – 1.5 % R.STAT/N	Aircraft blanket / EN 1149	10 ⁷ to 10 ⁸	10 ⁴ to 10 ⁵				
98.5 % PA - 1.5 % R.STAT/N	Needlefelt carpet / DIN 54345	10 ⁷ to 10 ⁸	10 ⁷ to 10 ⁸				
80 % polypropylene – 20 % R.STAT/N (conti- nuous yarn)	Mattress ticking DIN 54345	< 10 ⁸	10 ³				
Non-woven 93 % PET – 7 % R.STAT/N	Shoe insoles / DIN 54345	10 ⁵	105				

Norms

Textile material including a suitable content of R.STAT/N fibres can pass the following norms:

- EN 1149 parts 1 (surface resistivity) and 2 (cross resistance) : electrostatic properties for protective clothing.
- DIN 54345: electrostatic properties of textiles (floorings, non-wovens, fabrics).

These values are non contractual and just indicative. We reserve the right to complement or amend them. More information, based on assimilated experience, is available on request. The given examples are only guidelines for you to design your own products. Information will be given on the basis of your own specifications that must have been supplied to R.STAT and is not a guarantee by R.STAT. Control, certification and validation of products (under their final commercial form and under real conditions of use) including R.STAT's technology lies with every user of R.STAT products.