



FINISHIG SOLUTIONS
PRO-PLAS[®]

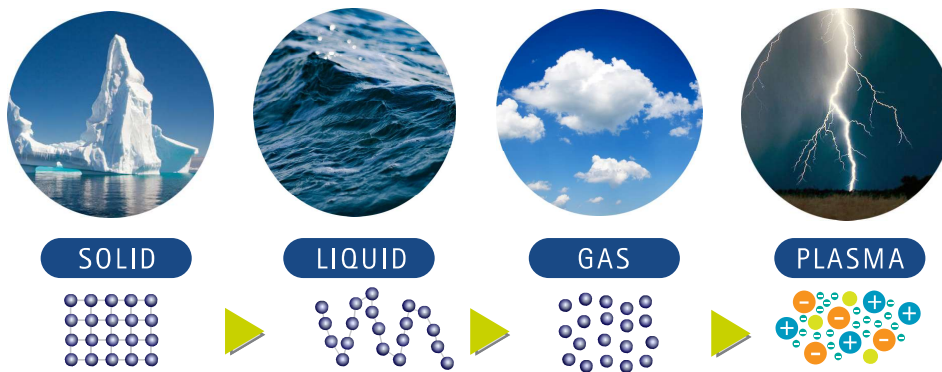
Plasma finishing
finitura tessile al plasma
Plasma-Veredelung
plasma finishing
plasma finishing
acabado de plasma textil
Plasma-Veredelung

PLASMA TREATMENT

■ WHAT IS PLASMA?

The word PLASMA has always been associated to high-end research and new technology development. In recent times, this word has been let out into the civilian life by the introduction of some plasma technologies in the consumer market.

Plasma is known as the fourth state of matter... what does it mean?



Matter, as we all studied at school, can be defined as the arrangement of its constituent atoms and their patterns.

Let's see an example of some well known matter:

if we take an ice cube we can feel it is a solid and its atoms are nicely packed together close to each other without much energy to move about. They are arranged symmetrically in periodic repeating patterns.



What happens if we add some energy to this ice cube? The atoms begin to move more freely and are weakly bonded to each other: the ice melts and the liquid takes the shape of the container because this state doesn't have any associated shape.

PLASMA TREATMENT

What happens if we add even more energy? The atoms of the liquid absorb this energy and become free from any bonds they had:

we obtain the the **gaseous state**. Gas molecules no longer feel the need to stich to each other and they can pretty much wander about in whatever space they get so the boundary now spreads to the whole room.

Remember though that the number of atoms hasn't changed and if you decide to cool down the whole room you won't have a room size ice cube but just the ice cube you began with.

PLASMA

GASEOUS STATE



Now, what happens if we add energy one more time? We ionize the gas and we finally have a plasma!

Plasma is similar to a gas but it is more free. In plasma, we have ionized the atoms of the gas and instead of a cloud of atoms floating around, you have a cloud of negatively and positively charged particles (electrons and ions) that have a lot of energy.

Since these constituents of plasma are charged, they become reactive to an externally applied electric or magnetic field. The way they react depends on the nature of the field we apply.

Plasma doesn't have any shape but can form structures when subjected to certain fields (Plasma globes, welding arcs...).

PLASMA TREATMENT

At each transit stage, energy has been added and has drastically altered the nature of the substance we were working with. In this way we go from tightly packed atoms to atoms that slip and slide beside each other but don't go far from each other, to atoms that fly everywhere, to atoms that have been broken into smaller bits: these are the different states of matter.

Plasma is called the fourth state of matter because, even if it is not yet known by everybody, it is not difficult to observe in nature:

- ▶ Lightning are plasma
- ▶ Aurora borealis are plasma
- ▶ Fire in a chemical reaction is plasma:

when you burn up something, you release a lot of energy; if the fire is hot enough, the gas will ionize and form a plasma.

In sum, the word plasma identifies the name used to refer to any ionised gas.

IONISED GAS = PLASMA



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SAVINGS

When a surface has been modified by, its functional properties change, but the volume properties remain the same. The new surface allows changing the intended use of the starting material, or it enhances its workability in the productive process or it donates completely new properties. By means of plasma process less chemicals, energy & water are used which leads to zero discharge.

PLASMA

PRO-PLAS[®]

70% less chemicals
80% less energy
90% less water
0% toxic discharge

COTTON PURGE

PRO-PLAS[®]



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■ POLYESTER SCOURING

PES fabrics at loom state have grease and stains that needs to be scoured before the heat-setting & dyeing/printing process, to avoid stiffening and disuniformity. PRO-PLAS can effectively replace the PES scouring process, eliminating completely the use of chemicals and detergents and reducing up to 100% the water consumption.

■ DIGITAL PRINTING & DYEING

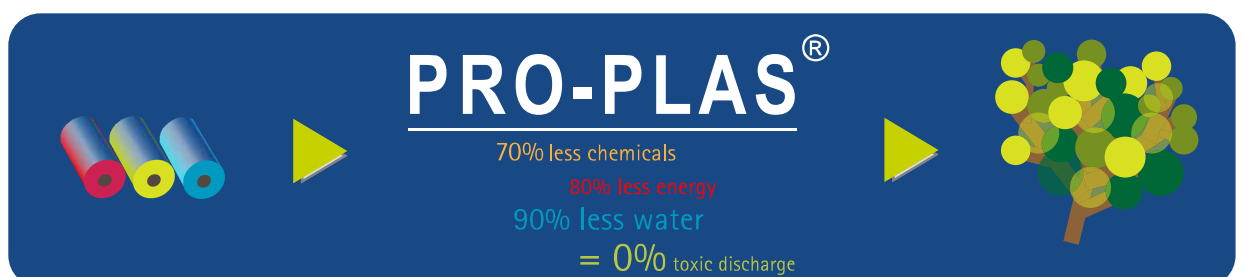
PRO-PLAS can be used for PES preparation for digital printing and dyeing (direct dyes). PRO-PLAS guarantees the effective replacement of traditional foulard (with chemicals) with a water-less process which ensures no bleeding, higher definition, brilliant colors and modulation of color penetration.

■ PREPARATION FOR ROTARY PRINTING

PRO-PLAS can be used to replace the rotary printing traditional preparation (replaces foulard). The process with PRO-PLAS is 100% dry, uses up to 99% less chemicals, 90% less energy consumption and guarantees zero toxic discharges.

■ ANTI-STAIN FINISHING

Anti-stain finish processes have become the most important repellents of stains and dirt used on clothes, carpets, upholstery, draperies, leather and other household fabrics. Currently, the resin is applied by foulard/padding onto a fabric, followed by drying and curing. By using PRO-PLAS it is possible to transform anti-stain finishing in a sustainable, water-free and less energy-consuming process.



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■ PREPARATION

Cleaning of fibers and reduction of spinning/sizing oils & chemicals which may interfere with the traditional finishing treatments. Especially for synthetic fibers like polyester, polypropylene, polyethylene, carbon, aramid, glass, etc.

■ ETCHING

Removal of microscopic quantities of fibres from the fabric, arising micro-roughness (change of hand-touch) & increase of fabric specific surface. Especially for wool, nylon & proteinic substances in general.

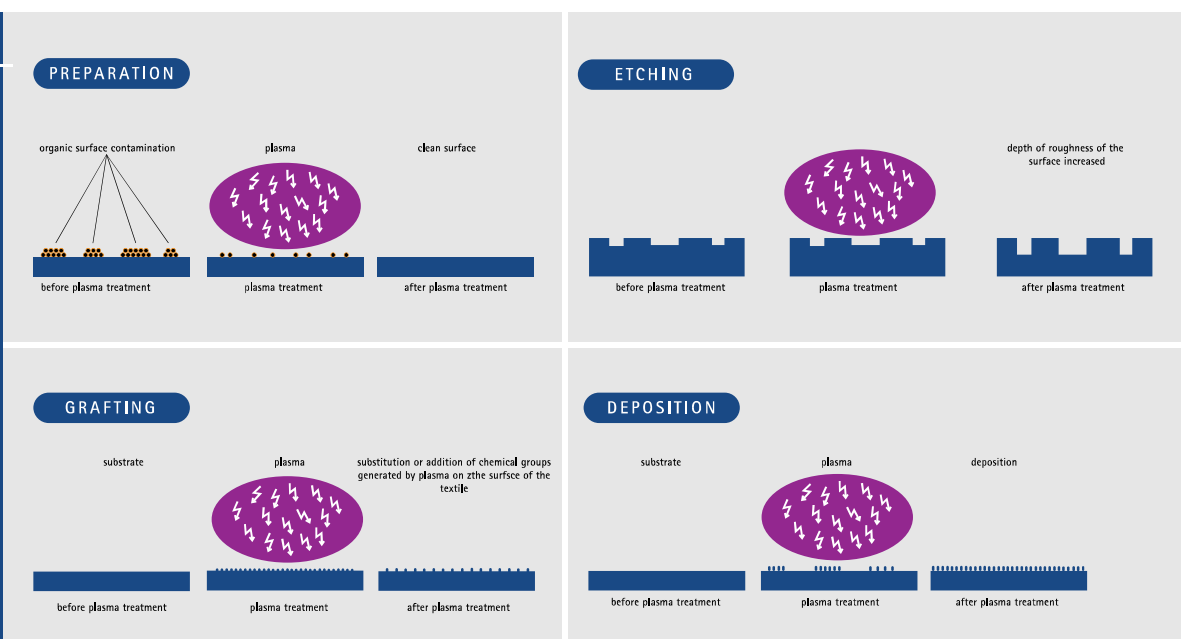
■ GRAFTING

By means of injecting special gases within the reaction chamber, it is possible to modify the chemical features of the surfaces without changing their mass properties. Therefore the fibre becomes more friendly against a wider range of chemicals, for example dyeing nylon with direct dyes)

■ DEPOSITION

By means of injecting soft gas from chemicals, deposition of thin films by means of localized polymerisation treatments. Results can be water or/and oil repellent or bacteriostatic fabric surfaces.

PLASMA TREATMENTS



PRO-SMH

