



Press Release

Bergamo, 21/01/2016

RadiciGroup and CNR-ISMAL Biella take up the MERMAIDS challenge: Commitment to environmental sustainability.

■ **For RadiciGroup, one more concrete step forward on sustainability:** the Group, whose businesses encompass the manufacture of polyamide and polyester yarns, has started a collaboration with CNR-ISMAL Institute in Biella, which is participating in the MERMAIDS project. The demonstration project is among those approved within the framework of the LIFE+ (LIFE+13) programme, the European financial Instrument for the environment.

■ **Objective of the LIFE+ MERMAIDS project:** to mitigate the environmental impact of micro- and nanoplastic particles resulting from laundry wastewater on European sea ecosystems. It does so by demonstrating and implementing innovative technologies and additives for laundry processes and textile finishing treatments. The total budget of the project is €1,287,123.

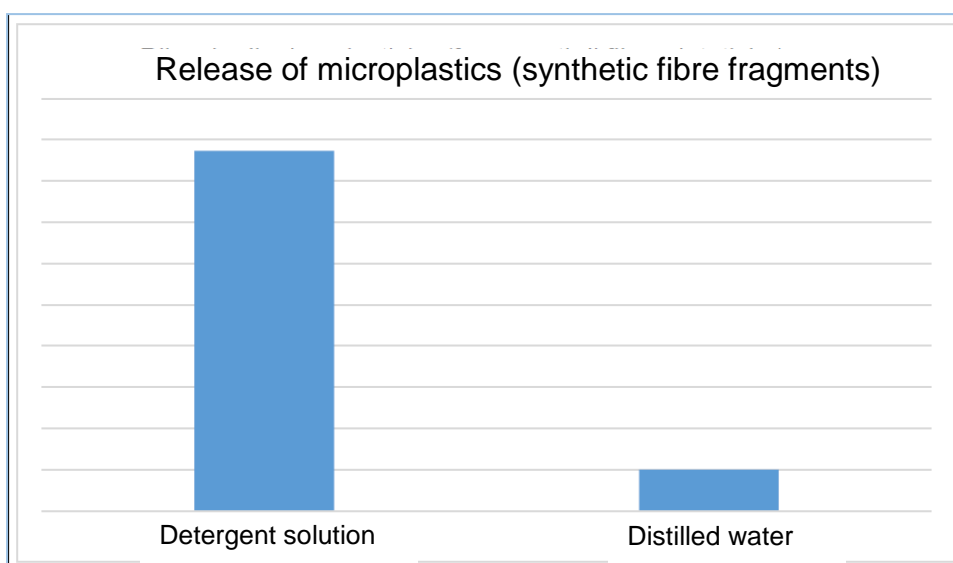
■ **The findings arising from the collaboration with CNR** will allow RadiciGroup to assist its customers in choosing the best products for their final use in terms of performance, on the one hand, and help reduce the quantity of microplastic fibres discharged into sea ecosystems, on the other.

The environmental impact of microplastics on marine ecosystems is a complex issue, which has been a topic of debate for quite some time. The problem has many causes, one of which involves the release of micro- and nanoplastic particles from synthetic fibres into wastewater during the laundry of synthetic or mixed fabrics. This particular aspect (which accounts for an estimated 10% of microplastic pollution as a whole) is the subject of a collaborative project that RadiciGroup is working on with [CNR-ISMAL](#) in Biella (the Institute for Macromolecular Studies [ISMAL], part of the Italian National Research Council [CNR]), one of the partners in the LIFE+ MERMAIDS project. MERMAIDS is a demonstration project – approved within the framework of the LIFE+ (LIFE+13) programme, the European financial Instrument for the environment – whose main

objective is to contribute to the mitigation of the impact caused by micro- and nanoplastic particles resulting from laundry wastewater on European sea ecosystems by demonstrating and implementing innovative technologies and additives for laundry processes and textile finishing treatments. Every wash of synthetic or mixed fabrics releases fibre fragments, from less than 5 millimetres to only a few microns in length, which wastewater treatment plants are not able to capture.

“We decided to offer to collaborate with the Biella CNR-ISMALC Institute, a partner and active participant in the MERMAIDS project,” said **Filippo Servalli**, *marketing manager of RadiciGroup*, “because we think that a scientific approach to the problem and the proactive engagement of the entire textile value chain – from the manufacturer to the final consumer – are the essential components of a plan having the objective to shed light on the important issue of the environmental impact of microplastics coming from the laundry of textile garments.”

The studies already conducted by CNR-ISMALC, including tests on knitwear samples made of RadiciGroup polyamide and polyester continuous yarn, have contributed to identifying a series of factors responsible for the release of microplastic fibre fragments from textiles containing synthetic fibres, during both domestic and industrial washes. As recently documented by the ISMAC team working on the project, **AMONG THE MOST CRITICAL FACTORS IDENTIFIED AS HAVING A MAJOR INFLUENCE ON THE RELEASE OF MICROPLASTIC FIBRES** are the intensity of the treatment and the type of detergent used. Other secondary factors were also evaluated, such as, the characteristics of the textile substrate (compactness, pilling propensity, seams and fibre characteristics) and, together with RadiciGroup, continuous filament treatments (bulking and dyeing).



Industrial laundry tests performed in a laboratory on RadiciGroup samples demonstrated how the same material releases, on average, 9 times more microplastics when using an alkaline detergent solution*, compared to pure distilled water. *UNI EN ISO 105-C12 STANDARD for colourfastness testing.

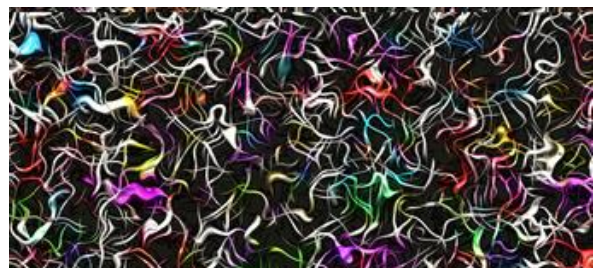
The preliminary phase of the Life+ Mermaids project (which started in July 2014) has been completed. Last November in Cologne, Germany, the ISMAC work team participated at a conference on [“Microplastic in the environment – sources, impacts & solutions”](#), where they received a positive response to their matter-of-fact approach to the microplastic issue. The team is working on the development of new textile finishing treatments that can minimize microplastic fibre removal in laundry processes, as well as endow the finished product with promising quality characteristics.

LIFE+ MERMAIDS

Partners in Mermaids. The National Research Council (CNR, Italy), participating in MERMAIDS through two of its institutes: the Institute of Chemistry and Technology of Polymers (ICTP) and the Institute for Macromolecular Studies (ISMAC). LEITAT (Spain), a technological centre specializing in production technologies. The Plastic Soup Foundation (PSF, The Netherlands), engaged in halting the increase in plastic contamination of our oceans. And Polysistec (Spain), a company engaged in the manufacture and marketing of textile auxiliaries.

Some of the expected results:

- Reduction of at least 70% in the total amount of microplastic fibres currently discharged into laundry wastewater.
- Optimization of washing process using new finished textiles, new detergents, and synergistic combinations of the new finished textiles and new detergents.
- Increasing the knowledge and awareness of consumers and professionals on measures to reduce microplastics arising from washes by providing them with a Good Practices Guidelines handbook.
- Policy recommendations to promote the widespread implementation of technologies that will contribute to reach Good Environmental Status (GES) by 2020.

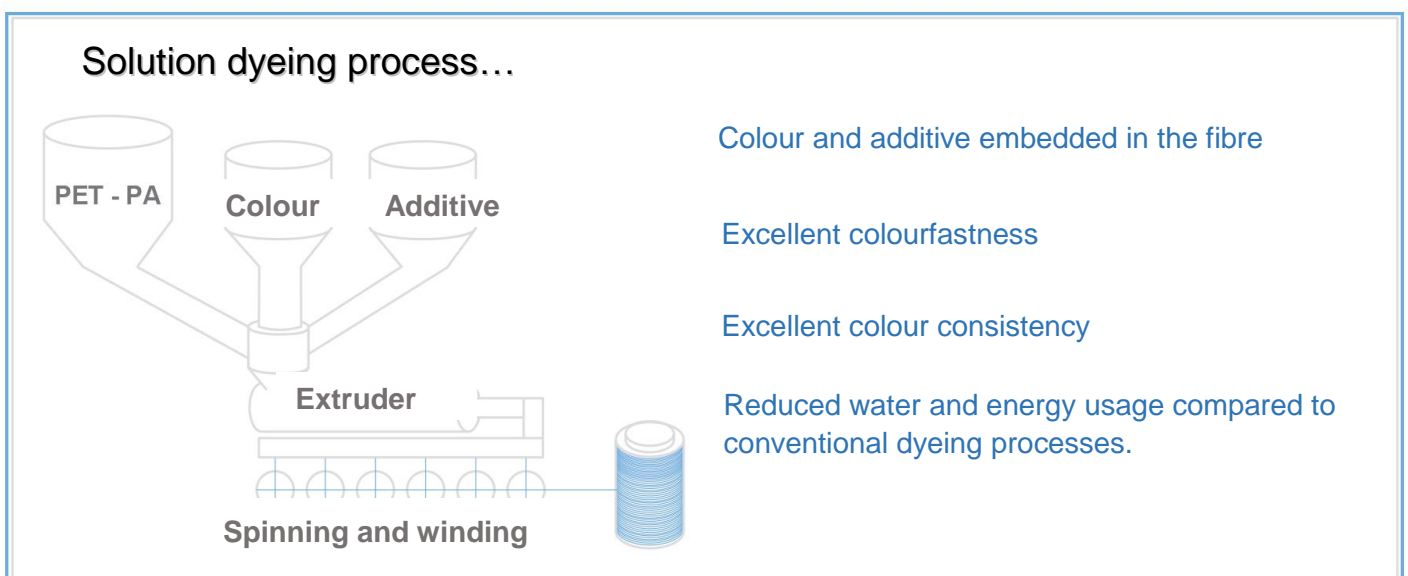


The results obtained from the study conducted on its PA and PET yarns have allowed RadiciGroup to identify some factors, tied to the yarn's characteristics, that can be taken into consideration, starting at the fabric design phase, in order to reduce the release of microplastics.

“The experimental data have shown, for example, that for both PA and PET solution-dyed yarns the values of the parameters affecting microplastic fibre discharge are lower than for other types of yarn,” said **Daniele Dossi**, *quality manager of Noyfil SA*. “These results, together with other findings arising from the collaboration with CNR, will enable us to assist our customers in choosing the best products for their final use in terms of performance, on the one hand, and reduce the impact of released microplastic fibres, on the other.”

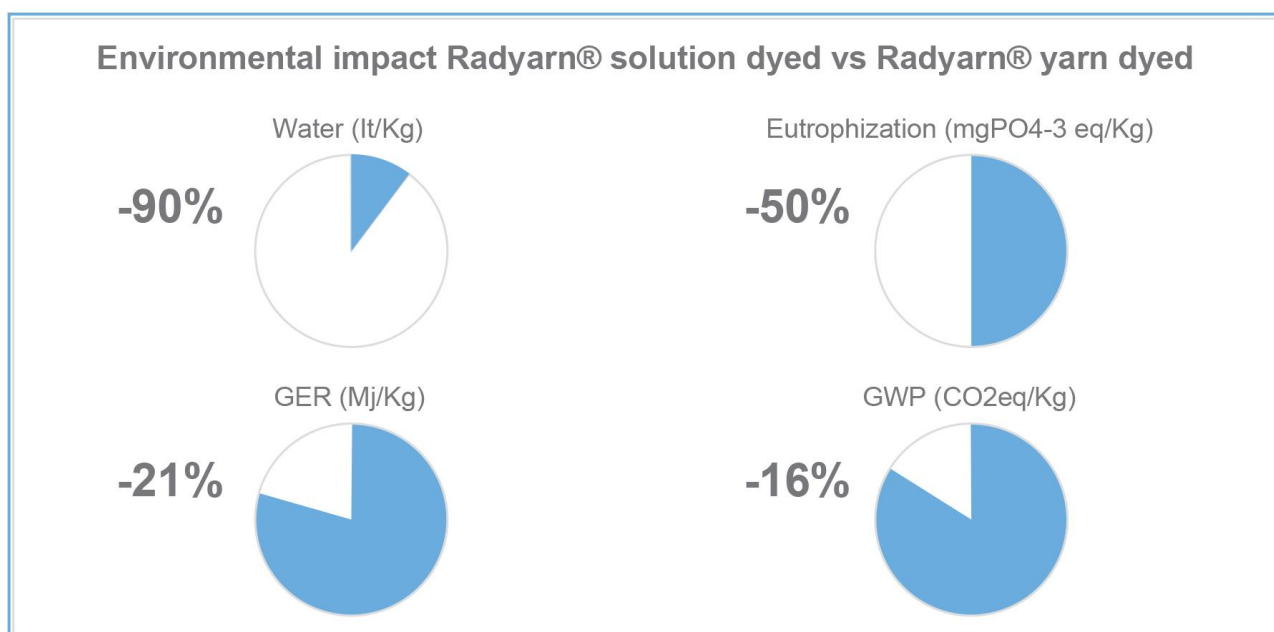
About solution dyeing...

Solution dyeing is a one-step process in which colour masterbatch is added to the polymer melt during the extrusion phase of fibre manufacturing and becomes an integral part of the polymer matrix. This technology allows for considerable savings of water and energy compared to traditional post-dyeing and finishing methods.



LCA (Life Cycle Assessment) studies done by RadiciGroup – *specifically the measurement of GER, GWP, eutrophization and water consumption for its Radyarn® PET yarn* – have demonstrated that solution-dyed yarn has a smaller environmental footprint compared to conventional post-dyed yarn.

Environmental impact of Radyarn® solution dyed vs. Radyarn® yarn dyed



For more information on RadiciGroup research studies

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RADICIGROUP – 2014 sales revenues of EUR 1.025 billion. Production and sales sites in Europe, North America, South America and Asia. Diversified businesses focusing on chemicals, plastics, synthetic fibres and nonwovens. Know-how. Vertically integrated nylon production. Constant commitment to guaranteeing its customers quality, sustainable innovation and reliability. All this is RadiciGroup, a leader in nylon chemicals. RadiciGroup products are used in applications such as: APPAREL – FURNISHINGS – AUTOMOTIVE – CONSUMER GOODS – CONSTRUCTION – ELECTRICAL AND ELECTRONICS – HOUSEHOLD APPLIANCES – SPORT. RadiciGroup, with its Chemicals, Plastics, Synthetic Fibres and Nonwovens Business Areas, is part of a larger industrial group that also includes textile machinery and energy businesses.
