

Nano Bubble Technology: A New Way to Sustainable Jeans Finishing

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Denim jeans can be considered as the most widely used garment in the fashion business. Among all the textile products, no other fabric has received such a wide acceptance as denim jeans. It has been used extensively by people of all ages, classes and genders. Industrial washing of denim jeans is one of the most widely used finishing treatments that have vast usage, due to its effects on appearance and comfort. It is now an indispensable process for producing fashion items. There are almost countless variations of dry and wet processing techniques used by designers and textile chemists to achieve fashionable looks that are distinctive and desirable.

With the increasing awareness about and concern for environmental issues, such as large amounts of effluents produced and high consumption of water and energy, wet processes related to denim washing are considered as not environmentally friendly. To address the environmental concerns, some finishing techniques have been introduced as an alternative to the conventional wet processing.

A new technology based on nano bubbles developed and patented by a Spanish company, Jeanologia, is known as e-flow. The e-flow 'breaks up' the surface of the garment, achieving soft hand feel and controlling shrinkage. A minimal quantity of water is needed and there is zero discharge from the process. Air from the atmosphere is introduced into an electro flow reactor and subjected to an electromechanical shock creating nano bubbles and a flow of wet air. Figure 1 shows the e-flow process scheme.

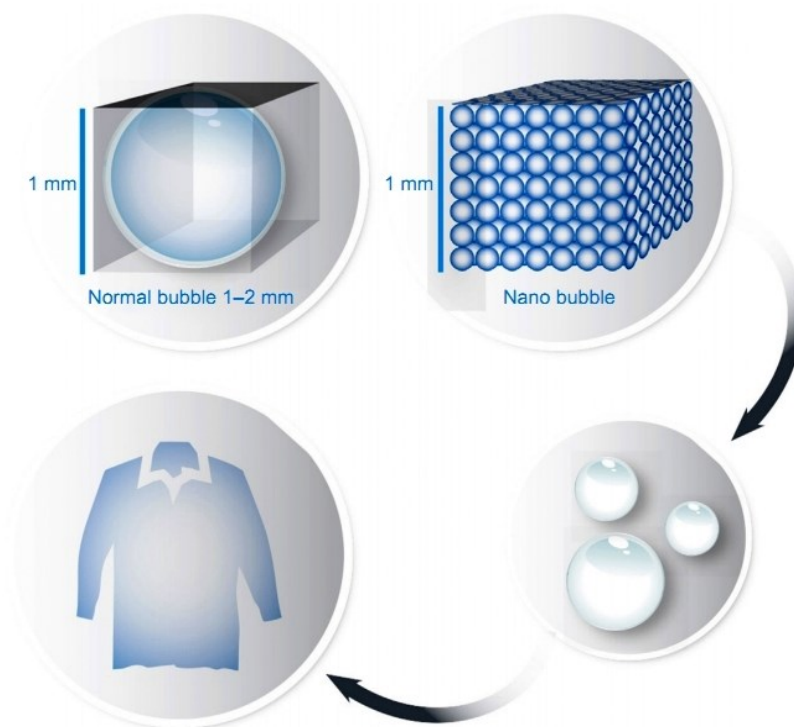


Figure 1: e-flow process scheme © Jeanologia 2014.

The nano bubble mix is then transported into a rotating tumbler containing the denim garments, and when it comes into contact with them produces a soft and natural hand feel. The garments are then dried in the same tumbler. When treating indigo dyed garments with this technology, some indigo cross contamination may occur that can be eliminated by a dry ozone treatment. Some examples of the use of this technology in the sample garment shown in Figure 2.

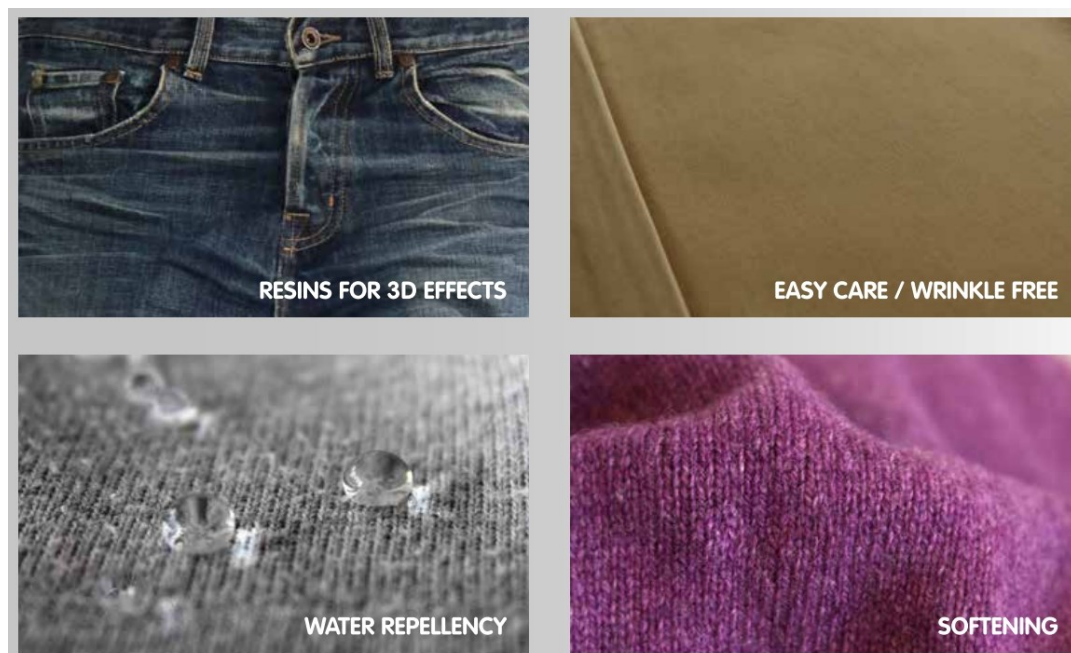


Figure 2: Some examples of the use of nano bubble technology © Jeanologia.

The use of the e-flow technology derives a significant reduction of use of resources: water use reduction up to 98%, energy use reduction up to 47% and eliminating chemical wastes associated to water dumping, all of them involved in garment finishing processes.

The e-flow process produces a pre-shrinkage of the fabric, avoiding high shrinkage during home laundry. It also gives a softer hand feel and so the garments are comfortable to wear and even the rub fastness properties are slightly improved.

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