

VELASOFT® NE 100 for Heat Protection

A naturally derived polymer that can defend against the damaging effects of thermal hair styling. VELASOFT® NE 100 holds style and combats frizz even after 24 hours in high humidity, shields against damage such as cracking and raising of the cuticle edge, yet washes out easily to leave hair feeling healthy and manageable.



**COSMOS
APPROVED**

Applications	Benefits	Physical & Chemical Properties	
<ul style="list-style-type: none"> Non-aerosol pump sprays Aerosol and non-aerosol mousse Serums, lotions and creams 	<ul style="list-style-type: none"> Shields against cuticle damage Holds style and combats frizz Prevents roughness, making the hair feel sleek and easy to comb Protects against the loss of hair strength Washes out easily, leaves no residue or build-up 100% naturally derived 	INCI	sodium polyitaconate
		CAS#	26099-89-8
		pH at 10% solid	5.2
		Odor	none
		% Active	~83%
		Chemical nature	itaconate homopolymer
		Appearance	off-white powder

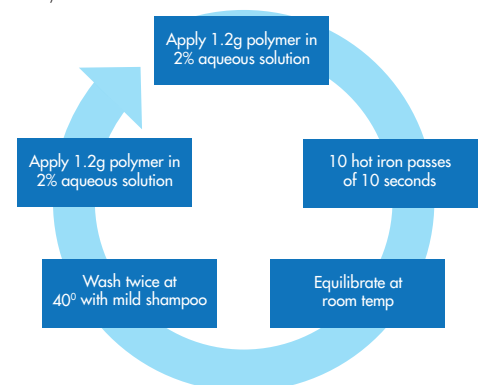
Natural and naturally-derived are enduring concepts within Personal Care and although ingredients of natural origin have become increasingly desirable in Hair Care there is still a need for them to offer at least comparable, but preferably superior, performance to the petrochemical based materials they are replacing and at an affordable price. The solution for protecting hair from heat damage is **VELASOFT® NE 100**.

Frizz Reduction and Style Hold

Hydrogen bonds are broken when hair becomes wet either during washing and styling or when hair absorbs water from the environment in high humidity conditions. For heat styled hair this can lead to a loss of hold and frizzing, particularly for naturally wavy or curly hair. **VELASOFT® NE 100** performs as well as a number of synthetic polymers in keeping a straight style when subjected to 85% humidity for 24 hours.



VELASOFT® NE 100 and other products claiming heat protection were then tested to see how they would perform over repeated cycles of use.



Thermal hair styling is commonplace amongst today’s consumers and consequently hair products that offer protection from heat damage are a key component of many hair care product ranges. These products can be used during thermal styling to help prevent cuticle damage such as cracking, breaking and raising of the cuticle edge which would otherwise lead to a rougher hair surface and increased porosity. If allowed to occur this will create increased friction between the fibres making the hair more difficult to comb. Moreover, structural damage will reduce the tensile strength of the hair fibres leading to more breakage.

Damage Control Experiments

1.2g of a solution of the polymer in water at 2% was applied to tresses made from wavy European brown hair and combed through. For the control, water was used in place of the polymer solution. A straightening iron was used to hot style the tresses at 200°C. 10 passes of 10 seconds each were made for each cycle. Following each cycle, the tresses were washed and then evaluated at the end of multiple cycles.

Tensile Strength

The load to breaking point was determined for individual fibers. **VELASOFT® NE 100** was shown to give a 15% improvement in tensile strength compared to both the control and a synthetic polymer (Figure 1).

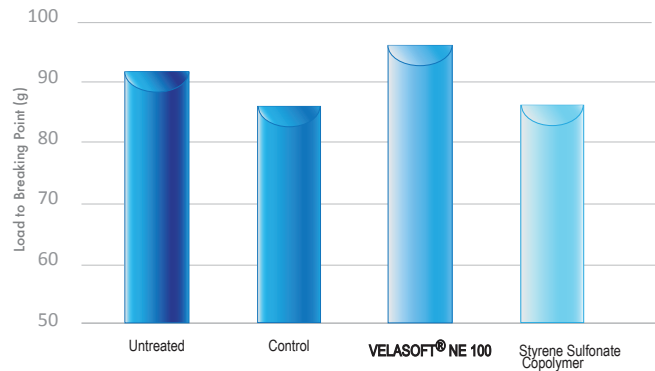


Figure 1: Individual Fibre Strength (10 treatment cycles)

Comb Force

Cuticle damage leads to an increase in fiber surface roughness and so an increase in friction between fibers. A greater force is therefore needed to comb the tress. The force required after hot iron straightening is more than halved when using **VELASOFT® NE 100** vs the control. Some synthetic polymers leave residues on the hair, even after washing, which is shown to significantly increase the force needed to comb the hair (Figure 2).

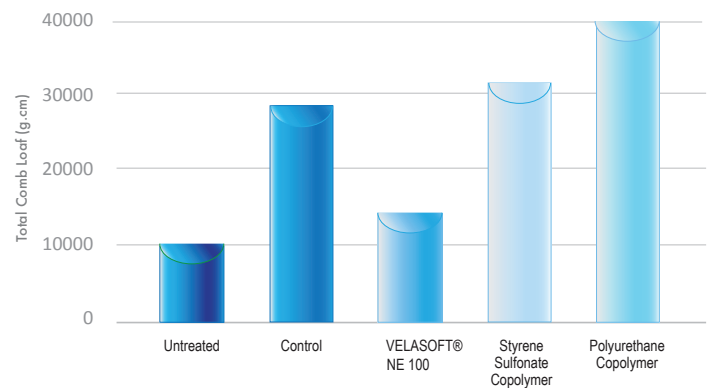


Figure 2: Comb Resistance (10 treatment cycles)

SEM

Consumers are concerned that styling products build-up on hair after prolonged use. This can lead to a reduction in the sensory feel of hair; product build-up might also reduce the effectiveness of other treatments such as hair coloring. SEM Imaging shows how **VELASOFT® NE 100** not only protects the cuticle from damage, but does so without leaving any polymer build-up or residue (Figure 3).

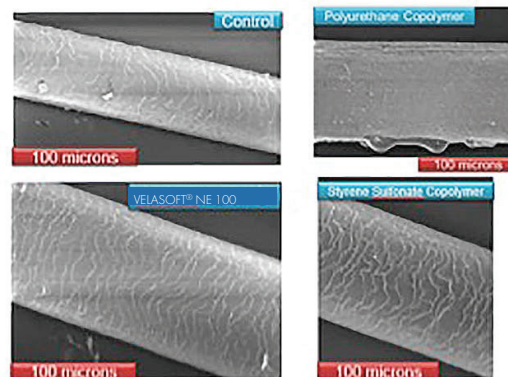


Figure 3: SEM images of individual fibres (20 heat treatment cycles)

