



**Life BioNaD - Naturalised dyes replacing commercial colorants for environmentally friendly leather dyeing and water recycle**



<b>Expedient</b>	LIFE12 ENV/IT/00035	<b>Date</b>	01-JAN-2014 to 30-JUN -2016	<b>Location</b>	
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<b>Coordinator</b>	Chemical Institute of organometallic compounds of CNR				
<b>Consortium</b>	SERICHIM SRL , Italy		Chemical Department "Ugo Schiff" at Florence University, Italy		
	Biokimica SpA, Italy		Asociación de Investigación para la Industria del Calzado (INESCOP), Spain		
<b>Objective</b>	<p>The BioNaD project's main objective focuses on demonstrating the economic and environmental performance of innovative dyes for the leather industry. These so-called 'naturalised dyes' provide an alternative to conventional methods (that commonly rely on acid dyes). The project will also test bacteria-based degradation processes on dye effluent wastewater, enabling it to be recycled of water and thus reducing water consumption. Specific project actions will demonstrate:</p> <ul style="list-style-type: none"><li>• The synthetic chemical design of dyes in compliance with EU REACH Regulation (CE) No. 1907/2006;</li><li>• The use of lactose from waste milk serum to generate naturalised dyes;</li><li>• The use of naturalised dyes with a higher purity than commercial acid dyes;</li><li>• The avoidance of chemical additives in the dyeing processes; and</li><li>• The use of eco-friendly Escherichia Coli biodegradation technology, to achieve the purification of dye-containing effluents in aerobic conditions without the generation of toxic metabolism by-products;</li></ul>				
<b>Expected results</b>	<p>The project expects to achieve the following results:</p> <ul style="list-style-type: none"><li>• Total elimination of chemical additives as dispersing agents and surfactants from the synthesis output of dyes;</li><li>• A 100% increase in the purity of naturalised dyes in comparison with commercial dyes;</li><li>• An 80-100% reduction in the release of lactose from waste milk serum into the environment;</li><li>• A 70-100% reduction in pollutants in dyeing wastewater; A 70-100% increase in the biodegradability of dyeing wastewater;</li><li>• Recycling of 100% of bacteria biomass for further wastewater purification;</li><li>• A 20% increase in penetration of naturalised dyes into leather;</li><li>• A 20% increase in efficacy for dyeing homogeneity;</li><li>• A 10-15% increase in bath exhaustion;</li><li>• A 15-20% improvement in the quality of dyed leather using finishing protocols;</li><li>• A 50% improvement in the purification of dyeing effluents using E. Coli bacteria;</li><li>• A 40-50% reduction of the COD and BOD of dyeing wastewater; Recycling of 70-80% of purified wastewater (e.g. for further dyeing);</li><li>• A 40-50% reduction in water consumption; and A 20-30% reduction in energy consumption.</li></ul>				