

ACRONYM		RESTORM	
TITLE: RADICAL ENVIRONMENTALLY SUSTAINABLE TANNERY OPERATION BY RESOURCE MANAGEMENT			
Project Nº:	GRD1-2001-40469		
R+D Program / Type:	PROMOTING COMPETITIVE and SUSTAINABLE GROWTH. (GROWTH) PROGRAMME		
Starting Date: 01/07/2002	Final Date: 31/06/2006	Duration: 48 MONTH	
Prime Proposer: BLC LEATHER TECHNOLOGY CENTRE LIMITED		Co-ordinator: BLC LEATHER TECHNOLOGY CENTRE LIMITED	
RTD's Performers: <ul style="list-style-type: none"> - ECCOLET SKO A/S - PITTARDS PLC GLOVE LEATHER DIVISION - PITTARDS PLC SHOE AND LEATHERGOODS DIVISION - VIPO A/S - INDUSTRIAL IGUALADINA SL - BIOTIM - A DIVISION OF FABROCOM AIR CONDITIONING - RWTH AACHEN - WASTE TO ENERGY LIMITED - COLOMER Y MUNMANY SA 		Other Partners (SMEs): <ul style="list-style-type: none"> -ASOCIACION DE INVESTIGACION DE LAS INDUSTRIAS DEL CURTIDO Y ANEXAS (AIICA) - FORSCHUNGSINSTITUT FUR LEDER UND KUNSTLEDERTECHNOLOGIE GMBH - THOMAS BATA UNIVERSITY - UNIVERSITY COLLEGE NORTHAMPTON - UNIVERSITY OF WESTMINSTER - UNIVERSITY OF PISA, DEPARTMENT OF CHEMISTRY & INDUSTRIAL CHEMISTRY - CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (CSIC) - CONFEDERATION OF NATIONAL ASSOCIATIONS OF TANNERS AND DRESSERS OF THE EUROPEAN COMMUNITY - UNIVERSITY OF LLEIDA 	
OBJETIVES: <p>The AIM of the RESTORM project is to conduct research directed at resource management, that will assist the tanning industry to change production methods to ensure a sustainable manufacturing industry for the future. In order to transform the leather industry into one that has a sustainable future, it is necessary to adopt radical and integrated approaches to changing the way in which resources are managed. To remain competitive in the global marketplace, European leather producers must move away from producing waste, which has high adverse environmental and cost implications, to a production regime where traditional 'waste products' are either reused/recycled or converted into new, higher value products. In addition, the consumption of resources will be minimised.</p>			
WORK DESCRIPTION: <p>The key aim of the RESTORM project is to address the short, medium and long term research needs of the European leather industry in terms of waste management and cleaner (greener) processing. To meet this aim, a series of objectives have been identified and quantified where possible. The workplan is structured to address each of these objectives through a series of discrete work packages. In view of the size of the proposed project, each work package will be broken down, where appropriate, into tasks identifying key elements and milestones of the research programme. To achieve the objectives of the project, the work will be split into seven stages, each of which will form discrete, interdependent and temporally related work packages, to yield three major project deliverables through a framework of effective project management.</p> <p>The main project deliverables are as follows:</p> <ul style="list-style-type: none"> • Closed loop beamhouse system for the leather industry. • Biochemical beamhouse operation for the leather industry. • Value added products based on collagen or associated skin proteins. 			

The seven work packages are the following:

WP 1: UTILISATION OF EXISTING PROTEINACEOUS WASTE FROM THE LEATHER INDUSTRY TO PRODUCE HIGH VALUE PRODUCTS – ECODHESIVES

WP 2: MATHEMATICAL MODELLING AND ENGINEERING OF COLLAGEN CONVERSION PROCESSES

WP 3: WATER AND CHEMICAL RECOVERY AND RECYCLING FROM BEAMHOUSE PROCESSING

WP 4: ANAEROBIC TREATMENT OF CONCENTRATE FROM RECYCLING PROCESSES

WP 5: DEVELOPMENT OF A NOVEL BIOCHEMICAL BEAMHOUSE OPERATION

WP 6: DEVELOPMENT OF NOVEL COLLAGEN BASED 'SMART' BIOMATERIALS AND NEW TEXTILES

WP 7: PROJECT MANAGEMENT



Liquid by-product recovery and re-use using membranes

Expected results:

Short term

- 100% utilisation of protein containing solid waste from beamhouse for production of value added products (ecodhesives, films, construction auxiliaries, gelatin)
- Mathematical and physical modelling of beamhouse operations
- 90% recovery of water through membrane filtration
- Technical evaluation of permeate for leather processing
- 100% removal of sulphate through anaerobic digestion
- Production of CO₂ for reuse in delimiting operations
- Chemical savings amounting to 30%

Medium term

- Four new enzyme activities identified to hydrolyse non collagenous components of skin
- 100% reduction in sulphide and lime for depilation
- 80% reduction in COD from beamhouse processing
- Zero ammonia discharge

Long term

- Novel collagen based textile with leather-like properties produced
- Smart biomedical materials produced containing active components
- Exploitation of hyaluronic acid in biomedical and industrial applications