

Growth Programme - RTD

Title :

SILICONE CROSS-LINKED POLYURETHANE MATERIALS FOR THROMBUS AND BIODEGRADATION RESISTANT SMALL-DIAMETER VASCULAR GRAFTS AND COATINGS OF BLOOD CONTACTING DEVICES

Generic activity MAT

Duration : 60 months

Proposal Reference GRD1-1999-10019

Project Acronym SILCROTHANE

Contract Reference G5RD-CT-2000-00220

EC Project officer U. FAURE

Abstract :

The objective of the project is to synthesize new functional silicone based materials (SILCROTHANE) with very low thrombogenicity activity and optimal biostability, and to process the new material by proprietary processing technologies to fabricate the following pre-clinical devices:

- a medium-diameter SILCROTHANE coated Dacron vascular grafts,
- a SILCROTHANE coated, stainless-steel 316L, balloon expandable vascular stent,
- a small-diameter vascular grafts made entirely of the SILCROTHANE material.

Coordinator

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Partnership

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Organisations

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University of Alcalà de Henares

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INVESTIGACION Y DESARROLO DE EQUIPOS MEDICOS S/A/

Consiglio Nazionale delle Ricerche (CNR)

University of Liverpool

Growth Programme - RTD

Title :

HIGH PERFORMANCE INDUSTRIAL POLYMERS BASED ON MODIFIED STARCH

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10200**Project Acronym** HYDROSTAR**Contract Reference** G5RD-CT-1999-00051**EC Project officer** T.K. TUORI

Abstract :

HYDROSTAR is an integrated European project on the utilisation of starch and starch derivatives in high quality , high value industrial polymers and a parallel assessment of the sustainability of such industrial polymers. The project addresses the needs of European society for a more sustainable feedstock base for large volume, high performance industrially useful polymers, used in decorative surface coatings, adhesives, paper coating and chemicals, extruded dermoelastics, superabsorbants and cobuilders for detergents, by changing the feedstocks of such polymers to more renewable raw materials. This will reduce finite resource consumption, be more environmentally benign as the renewable raw materials present less toxic handling and utilisation hazards and provide additional markets for materials from a wide range of European sourced crops such a potato, wheat, maize, barley and oats.

Coordinator

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Partnership

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D	BIOP BIOPOLYMER GMBH
FIN	RAISIO CHEMICALS OY
EL	INTERCHEM HELLAS S.A.
IRL	AMT Ireland
UK	IMPERIAL CHEMICAL INDUSTRIES PLC
F	Centre National de la Recherche Scientifique

Growth Programme - RTD

Title :

OPTIMISING POWDER-IN-TUBE TAPES IN MRI SYSTEMS AS ICE-BREAKER FOR HTS SOCIO-ECONOMIC BENEFITS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10206

Project Acronym OPTIMISE

Contract Reference G5RD-CT-1999-00049

EC Project officer T.AGELADARAKIS

Abstract :

The long term goal of this project is to lower the total energy consumption by 6%, create 85.000 new jobs in EU and reduce length of hospital stays by forming the basis for a widespread use of superconductors in e.g. Magnetic Resonance Imaging (MRI). After the discovery of High Temperature Superconductors (HTS) the primary bottleneck is no longer the cooling costs, but the price/performance of HTS materials. The objective of this project is to improve the price/performance by one order of magnitude within the project period and form the basis for an additional one order of magnitude improvement. The improvements will be obtained by further development of the only technique that has proven to be able to produce long length HTS-tapes, the Powder-in-Tube (PIT) technique. The work will be focused on increasing production yield, lowering raw material consumption and developing the first HTS application, MRI, to act as an application ICEBREAKER for HTS.

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Nordic Superconductor Technologies A/S

Merck KGaA

ALLGEMEINE GOLD- UND SILBERSCHEIDEANSTALT AG

CRYOELECTRA GmbH

Ruhr Universitaet Bochum

Institute for Product Development

OXFORD MAGNET TECHNOLOGY Ltd.

Growth Programme - RTD

Title :

MACHINING AND ELECTRONIC PACKAGING OPTIMISATION BY APPLICATIONS OF PHASE-PURE NANOCRYSTALLINE DIAMOND

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10236

Project Acronym MEA-PPNCD

Contract Reference G5RD-CT-1999-00203

EC Project officer S. BECKER

Abstract :

In the next years, electronic commerce will affect the entire social life. The major technical challenge is to develop greatly increased communication capacities, and a recognized key bottle neck is the electronics thermal management. EU is yet depending on the US, and the aim is to solve the problem of the need of an entirely new thermal management system of increased performance on the basis of phase-pure nanocrystalline diamond. At the same time the demand for low weight and high performance components for automotive and aerospace applications requires the massive applications of new difficult-to-cut lightweight materials as MMC, Al-Si hypereutectical alloys and Ti. The materials developed within this project can solve definitively their machinability costs. This will sustain EU employment and economical, ecological and increased safety vehicles and aircraft.

Coordinator

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Organisations

AIXTRON AG

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University of Vienna

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

NOVATEA SPA

Growth Programme - RTD

Title :

DEVELOPMENT OF ACCELERATED TESTS OF CATALYST DEACTIVATION FOR PREDICTING LONG-TERM CATALYST ACTIVITY AND SELECTIVITY

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10239

Project Acronym DEACTIVATION

Contract Reference G5RD-CT-1999-00154

EC Project officer S. CERVERA MARCH

Abstract :

One of the most challenging tasks in the design and operation of industrial catalytic processes is the prevention of catalyst deactivation. Loss of catalyst activity is frequently accompanied by loss of selectivity, leading to increased levels of undesired byproducts, such as carbon oxides; inefficient use of feedstock and energy and increased environmental pollution. Replacement of catalyst requires the process to be shut down for several days with loss of revenue and competitiveness. The main objectives of this project are to understand the mechanism of catalyst deactivation and develop tools that rapidly age catalysts, in order to predict their commercial performance in laboratory-based tests of short duration rather than prolonged pilot plant studies. A dual approach to the problem of catalyst deactivation and design of improved catalysts will be explored, involving

- (1) advanced characterisation studies of fresh and aged catalysts and
- (2) development of accelerated ageing methods to model and predict catalyst performance under commercial conditions.

The output will be the design of catalysts with improved economic and environmental performance for production units.

Coordinator

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UK	C2 CHANDLER CONSULTING
NO	Norwegian Institute of Technology
EL	University of Patras
B	Université Catholique de Louvain
E	COMPANIA ESPANOLA DE PETROLEOS, SOCIEDAD ANONIMA
D	Linde Process Engineering and Contracting Division
UK	BP CHEMICALS LTD, RESEARCH & ENGINEERING
UK	University of Cambridge

Growth Programme - RTD

Title :

MOLECULAR MODELLING FOR THE COMPETITIVE MOLECULAR DESIGN OF POLYMER MATERIALS WITH CONTROLLED PERMEABILITY PROPERTIES

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10273

Project Acronym PERMOD

Contract Reference G5RD-CT-1999-00200

EC Project officer T.K. TUORI

Abstract :

Materials with precisely controlled permeability properties are very important to solve a wide scale of separation problems in chemical industry, environmental protection, biomedecine and biotechnology alone is unreliable, time consuming and expensive. Molecular modelling offers a very attractive alternative, but its techniques need to be further developed and validated by application to complex systems of technological interest. With the computer-aided materials design approaches that will be developed in the course of the project, it will be possible not only to optimise materials selection for existing applications, but also to think about new membrane-based processes of chemical synthesis, separation and controlled delivery that will be more economical, energy-saving and environmentally friendly than existing ones.

Coordinator

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Partnership

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GKSS Forschungszentrum Geesthacht GmbH

Air Liquide SA

Molecular Simulations Limited

National Center for Scientific Research "Demokritos"

Research Institute on Membranes and Modeling of Chemical Reactors

Growth Programme - RTD

Title :

DEVELOPMENT OF ADVANCED JOINING TECHNOLOGIES FOR SUPERMARTENSITIC STAINLESS STEEL LINE PIPES

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10278

Project Acronym JOTSUP

Contract Reference G5RD-CT-1999-00053

EC Project officer E. NAEGELE

Abstract :

The JOTSUP project will develop advanced welding technologies by using laser beam (LB), low vacuum electron beam (EB) and radial friction techniques, improve the pipe manufacturing efficiency as well as to fully exploiting the advanced properties of the new generation supermartensitic stainless steels and new joining technologies. Furthermore, it also aims to develop strength matching welding consumables (which are not available today) for this high strength grade steels, to improve structural behaviour of the welded flow lines during the pipe laying (e.g. reeling) and service of oil and gas industry for transportation of unprocessed oil and gas in the North sea. The benefit of the project on the environment is anticipated via a reduced use of chemical inhibitors for preventing corrosion in gas transport and increased safety against failure. The JOTSUP project consists of 14 partners from six European countries.

Coordinator

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S	Esab AB
UK	Stolt Comex Seaway Ltd
NO	SINTEF
D	H. Butting GmbH & Co. KG
D	PRT Präzisionstechnik GmbH
D	Erndtebrücker Eisenwerk GmbH & Co.
D	Böhler Thyssen Welding
D	Krupp Thyssen Nirosta GmbH
B	SA. FABRIQUE DE FER DE CHARLEROI
D	GKSS Forschungszentrum Geesthacht GmbH
B	BELGISH INSTITUUT VOOR LASTECHNIEK
D	Bremen Institute of Applied Beam Technology

Growth Programme - RTD

Title :

RHEOLOGY ENGINEERED WATER BORNE DISPERSIONS FOR HIGH PERFORMANCE PAINTS

Generic activity MAT

Duration : 42 months

Proposal Reference GRD1-1999-10304

Project Acronym R.E. POLYMERS

Contract Reference G5RD-CT-1999-00042

EC Project officer T.K. TUORI

Abstract :

In this project, dendritic polymer technology and novel polymerisation technology will be adapted to the paint market. The main outcome will be new, environmentally friendly water borne paints, which will be tested in full or pilot scale application. The objective is to increase performance and lifetime of the coatings and to give excellent protection to the substrate. The project will introduce novel ways of rheology control in water borne paints by:

- (1) Introducing sites at the surface of the latex particles for tailor-made interactions with the associative thickeners. The new types of latexes will be produced by novel synthesis of surfactants and amphiphilic polymers, using novel techniques such as controlled radical polymerisation in emulsion polymerisation.
- (2) Introducing hydrophibically end-capped dendritic polymers as cross-linkers.

Coordinator

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S	Perstorp AB
S	Perstorp Clariant AB
I	BOERO COLORI srl
F	Centre National de la Recherche Scientifique
NL	Technical University of Eindhoven
S	Institute for Surface Chemistry (Ytkemiska Institutet)

Growth Programme - RTD

Title :

ON-LINE MONITORING AND IN SITU CONTROL OF EPITAXY METAL ORGANIC CHEMICAL VAPOR DEPOSITION

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10337

Project Acronym ISCE-MOCVD

Contract Reference G5RD-CT-1999-00216

EC Project officer B. TUBBING

Abstract :

Metal organic Chemical Vapour deposition (MOCVD) is a key manufacturing process for microelectronic and optoelectronic devices. However, in a MOCVD production process the deposition process is not monitorable, nor due to a lack of in-process monitoring closed loop control. We focus on in situ monitoring of the MOCVD process for the two material systems, which are the industrially most requested: a) ternary and quaternary {al, ga, in} - {as, p sb} semi conductors for optical communication applications and b) on gallium nitride (GAN) and related materials, which have promising applications for blue laser diodes, high power microwave semi conductor devices etc.. This project aims on using, improving, combining and developing real time monitoring techniques and closed loop feedback control of epitaxial growth, where the sensors used in situ are purely optical ones, compatible with different industrially used MOCVD growth systems.

Coordinator

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F	THOMSON CSF
UK	Epitaxial Products International Ltd
D	SENTECH INSTRUMENTS GMBH
A	Universitaet LINZ JOHANNES KEPLER
NL	Philips Analytical B.V.

Growth Programme - RTD

Title :

DEVELOPMENT OF HYBRID MOULDING TECHNOLOGIES FOR CONTINUOUS FIBRE AND SELF-REINFORCED THERMOPLASTIC MATERIALS

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10356**Project Acronym** HYJECT**Contract Reference** G5RD-CT-1999-00047**EC Project officer** S. CERVERA MARCH

Abstract :

It is proposed to develop new unique injection moulding technologies: The MLIM (Multilayer Injection Moulding) process for layered structures with semicrystalline, self-reinforcing thermoplastics (SSRT) and short fibre reinforced thermoplastics (SFRT) using fibre braids as an exoskeleton structure or thermoplastic composite inserts. With the MonoCom process (Mono-sandwich injection process in combination with an overmoulding tool, special control of injection and several movable mould cores for melt distribution and extending of cavity) controlled multifunctional moulding can be realised.

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NL**Organisations**EUROCARBON
Federal Institute for Materials Research and Testing
Structoform GmbH
Savoy Moulage
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Promolding

Growth Programme - RTD

Title :

DEVELOPMENT OF PLASMA PROCESSES FOR USE IN CLEANER PRODUCTION AND STERILIZATION OF MEDICAL DEVICES

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10382

Project Acronym PLASMA PROC/MED

Contract Reference G5RD-CT-1999-00007

EC Project officer U. FAURE

Abstract :

This research work faces two major needs of the European society: to be able to get safe and environmentally acceptable products. The proposed work is dealing with the problems concerning the sterilization methods used today, especially the problem that these methods cannot inactivate neither endotoxins (pyrogens) nor prions (BSE-pathogens) and the fact that especially the toxic EtO gives questionable working conditions, as well as problems for the environment and biocompatibility problems on the surface of the products. Furthermore the proposed work deals with the development of new coating techniques on high comfort low friction catheters made of new metallocene catalyzed polyolefins instead of the environmentally questionable PVC used today. The technology to be used to obtain these main goals will be plasma technology based environmentally harmless gases.

Coordinator

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Partnership

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DK	Coloplast A/S
IL	PLASMA ANALYSES LTD.
DK	NATIONAL CENTRE FOR HOSPITAL HYGIENE
D	Plasma Technik Grün GmbH

Growth Programme - RTD

Title :

RAPID AND LOW COST DEPOSITION OF COATING THROUGH A NOVEL HYBRID PLASMA SOURCE

Generic activity MAT **Duration :** 46 months
Proposal Reference GRD1-1999-10393 **Project Acronym** HYBRID
Contract Reference G5RD-CT-1999-00110 **EC Project officer** S. BECKER

Abstract :

This project aims to reduce costs of PVD coating and so enable wider take-up of this technology in general, specifically tackling the need for low cost, high quality coating in: the production of enhanced wear resistant coating for tooling in the aircraft industry; the deposition of low friction coating for automotive engine parts; the improvement of binding procedures in diamond grinding wheels; the application of decorative coating on taps, mobile phones, door handles etc.. This will be achieved through the development of novel hybrid plasma sources for the deposition of very high quality coating at very high rates both under vacuum and at atmospheric pressure. These novel devices will be combined with existing PVD and PECVD technologies, such as magnetron sputtering in such a way as to maximise the advantage of both techniques.

Coordinator

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E	CONSTRUCCIONES AERONAUTICAS S.A.
S	University of Uppsala
IRL	AMT Ireland
IRL	Top Tech Ireland Limited
UK	Teer Coating Ltd.

Growth Programme - RTD

Title :

NOVEL BIORESORBABLE SCAFFOLDS AND CULTURE METHODS FOR CARTILAGE TISSUE ENGINEERING

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10397

Project Acronym SCAFCART

Contract Reference G5RD-CT-1999-00050

EC Project officer U. FAURE

Abstract :

Tissue engineering approaches have been successfully applied to the treatment of injured articular cartilage. However, problems encountered include the poor quality of regenerated tissue and difficulty in integrating engineered cartilage at the clinical site. This RTD project takes a problem solving approach to improve significantly the quality of tissue engineered cartilage by combining optimised scaffolds with advanced culture methods. Integration at the surgical site will be achieved by generating an osteochondral construct. The latter will also be applied to extend tissue engineering to the treatment of degenerative joint disease and facial cartilage deformity. This RTD project will set new high standards for the biological quality of engineered human tissues to ensure that the European tissue engineering industry is competitive on a world stage, improving quality of life while stimulating economic development.

Coordinator

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University of Basel

Trinity College Dublin

ISOTIS BV

University of Sheffield

Fidia Advanced Biopolymers srl

Growth Programme - RTD

Title :

ACTIVATED CVD FOR IN-LINE COATING OF TEMPERATURE SENSITIVE PARTS, AT ATMOSPHERIC PRESSURE

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10401

Project Acronym ACTIVATED CVD

Contract Reference G5RD-CT-1999-00160

EC Project officer S. BECKER

Abstract :

The proposal targets a substantial increase in scope of CVD which strengthen the competitive European position in a innovative, high added value, strategic and rapidly growing technology. By adding enhanced functionality to surfaces the reliability, performance and lifetime of products will be extended. Key targets are to develop and scalable coating technology with low capital cost and high energy/material efficiency. Four CVD activation technologies are selected and 3 concept demonstrators are considered necessary for full demonstration. Each considers a different critical (for exploitation) balance of process temperature, substrate type/shape and process volume/throughput. The partnership includes a balance of equipment suppliers, technology developers and end users. Seven countries (incl. less advanced) and 3 SMEs are included.

Coordinator

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I	Ce.Te.V. Centro Tecnologie del Vuoto S.C.p.A

Growth Programme - RTD

Title :

CONDUCTIVE NANOWIRES FOR APPLICATIONS IN MICROWAVE, MAGNETIC AND CHEMICAL SENSING DEVICES BASED ON POLYMER TRACK ETCHED TEMPLATES

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10428

Project Acronym NANOPTT

Contract Reference G5RD-CT-1999-00135

EC Project officer B. TUBBING

Abstract :

This project aims to develop new generations of templates for preparation of magnetic and conductive polymer nanowires. Patterning of track etched membranes, high electrical conductivity of polymer nanotubules, current control of magnetism and large saturation magnetisation and permeability of metallic nanowires will be studied and optimised in order to design microwave filters, non volatile memories and chemical sensors. The templates preparation will start with track etched membranes and will finish with ultra small holes (<10nm) in thin supported patterned films. These templates will have ideal hole size and shape for nanowires production (metals , conductive polymers) and for their fundamental properties study. More complex templates will also be prepared in order to allow the devices design. The economical outputs of the project are mobile phone , data storage, chemical detectors, lab on a chip.

Coordinator

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Partnership

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B	Université Catholique de Louvain
F	Centre National de la Recherche Scientifique
UK	EPICHEM LIMITED
D	Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V.
F	Université LOUIS PASTEUR

Growth Programme - RTD

Title :

HIGH CURRENT BI-2223 CONDUCTORS WITH INNOVATIVE WIRE GEOMETRY FOR POWER APPLICATIONS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10461

Project Acronym BIG-POWA

Contract Reference G5RD-CT-2000-00219

EC Project officer T.AGELADARAKIS

Abstract :

In the face of stiff competition from USA and Japan, this project will maintain Europe's depth of strength in the RTD of high temperature superconducting materials, so that European Industry can take full advantage of the new market in HTS applications that will emerge ten years from now. Round and square Bi-2223 wires with high currents will be designed, manufactured and then transposed and stranded for a power-link and a coil. New-loss conductors will be developed with twisted filaments and resistive barriers over 200m lengths. New reaction mechanisms will be defined with new precursor powders that will significantly increase the current capacity of Bi-2223 conductors. This work will be supported with new 3D modelling and characterisation studies. These will aid the design of better geometries and quantify the conductor benefits.

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I	Instituto Nazionale per a Fisica della Materia - INFN
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UK	University of Southampton
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CH	Swiss Federal Institute of Technology Lausanne

Growth Programme - RTD

Title :

SCANNING PROBE RESEARCH ON NANOSCALE MAGNETISM OF ADVANCED MATERIALS FOR HIGH RESOLUTION RECORDING

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10470

Project Acronym MAGNETUDE

Contract Reference G5RD-CT-1999-00005

EC Project officer B. TUBBING

Abstract :

The aim of this research project is the improvement of magnetic materials for state-of-the-art read heads for magnetic data storage technology and the attendant necessity for the development of magnetic imaging techniques. This will on one hand lead to a further development of magnetic storage technology and on the other hand enhance the competitiveness of European manufacturers in the field of scanning probe microscopy. To reach this goal, test samples have to be produced and used to optimise Magneto-Optic near field scanning microscopy, magnetic force microscopy and spin-polarised scanning tunnelling microscopy in order to reach magnetic image resolutions in the 10nm regime.

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Growth Programme - RTD

Title :

THROUGH PROCESS MODELLING OF FORMING AND FORMABILITY OF ALUMINIUM SHEETS AND PROFILES

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10489

Project Acronym VIRFORM

Contract Reference G5RD-CT-1999-00155

EC Project officer HL. SCHMIDT

Abstract :

This RTD project aims to improve productivity and product quality and to enable innovative solutions to future demands on safety, environment, design and user-friendliness. Products in this context are aluminium components for use mainly in transportation, but also products used in the building and packaging industry will be covered. The main output of the project is through process microstructurally based models with application to forming and formability of rolled sheets and extruded profiles of aluminium alloys.

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F	INSAVALOR
D	University of Stuttgart
NL	Hoogovens Corporate Services B.V.
NO	Hydro Aluminium a.s.
UK	Alcan International Limited
UK	University of Manchester
S	Institutet för Metallforskning
NO	SINTEF
S	Gränges AB

Growth Programme - RTD

Title :

ADVANCED MAGNETIC OXIDES FOR RESPONSIVE ENGINEERING

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10502

Project Acronym AMORE

Contract Reference G5RD-CT-1999-00138

EC Project officer B. TUBBING

Abstract :

AMORE wil develop a new generation of ferromagnetic half-metallic oxides and demonstrate their potential in pattered nanoscale magnetoresistance. The key idea is to exploit the high degree of spin polarisation of these chemically-stable oxides to achieve large magneto-resistive effects in the practical temperature range up to 120° C. For this, an understanding of spin transport at grain boundaries and interfaces in these materials is required. Having selected the most suitable of the new double perovskite oxides, the aim is to evaluate the technical and economic feasibility of magneto-resistive elements fabricated from them by two routes

- Screen printing, low-cost technique suitable for making contactless potentiometers for the auto industry among others, and

- Epitaxial thin-film growth for planar tunnel junctions suitable as magneto-electronic elements.

A new generic materials technology for sensitive, robust, low-cost components will be launched, which will boost European competitiveness in a fast-changing field.

Coordinator

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UNIVERSIDAD DE ZARAGOZA

Consejo Superior de Investigaciones Cientificas

Centre National de la Recherche Scientifique

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NAVARRA DE COMPONENTS ELECTRONICOS, SA

Growth Programme - RTD

Title :

JOINING DISSIMILAR MATERIALS AND COMPOSITES BY FRICTION STIR WELDING

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10551

Project Acronym JOIN-DMC

Contract Reference G5RD-CT-1999-00090

EC Project officer HL. SCHMIDT

Abstract :

Friction Stir Welding (FSW) technology will be developed for joining of dissimilar materials and composites through a generic, research-oriented project focusing on three material combinations. The materials selected for evaluation are industrially relevant combinations but are also representative of classes of dissimilar materials. In the first phase of the project, trial welds will be manufactured for each material combination, allowing key material and process issues to be identified. The objective is to establish a systematic understanding of the opportunities and challenges associated with FSW for each material combination. In the second phase, additional joints will be manufactured using a wide range of process conditions. Assessment of key metallurgical and mechanical aspects of the welds combined with modeling of FSW, will allow a set of "process guidelines" to be established for each material combination. These guidelines, which are based on fundamental principles, can then be used to gauge the appropriate welding conditions for other dissimilar materials. The knowledge gained will also be applied to the commercially important topic of weld repair using FSW techniques.

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P	INSTITUTO DE SOLDADURA E QUALIDADE
UK	University of Cambridge
UK	Council for the Central Laboratory of the Research Councils
DK	Risoe National Laboratory
D	DaimlerChrysler AG

Growth Programme - RTD

Title :

HIGH PERFORMANCE CERAMICS BY NEAR-NET-SHAPE FORMING PROCESSES

Generic activity MAT**Duration :** 48 months**Proposal Reference** GRD1-1999-10585**Project Acronym** HYPERCER**Contract Reference** G5RD-CT-1999-00116**EC Project officer** S. BECKER

Abstract :

The project is directed to the development of new ceramic forming processes for complex and highly reliable ceramic parts used in several applications. Especially in biomedical applications, i.e. complex joints, there is no satisfying solution available up to date. Therefore the problem solving approach is related to the development of an ankle joint prosthesis system with a ceramic/ceramic wear couple . This extremely complex joint system has been selected since extremely high strength ceramics with more than 1000 MPa are required. The results can be transferred to other joints, like knee, finger and foot. Furthermore the results obtained in this project may be transferred to other industrial sectors like automotive industry, either to be used as wear parts or even as cutting tools under dry operations, taking into account the environmental aspect and to avoid lubricants.

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I	CATHOLIC UNIVERSITY OF SACRED HEART
D	CERAMTEC AG-INNOVATIVE CERAMIC ENGINEERING

Growth Programme - RTD

Title :

TISSUE ENGINEERED BONE FORMATION, SUBSTITUTION AND REGENERATION: APPLICATION OF POROUS CALCIUM PHOSPHATE SCAFFOLD MATERIALS AND GROWTH FACTORS

Generic activity MAT **Duration :** 48 months
Proposal Reference GRD1-1999-10590 **Project Acronym** PORELEASE
Contract Reference G5RD-CT-1999-00044 **EC Project officer** U. FAURE

Abstract :

The demand for Bone Graft Materials (BGM) has been increasing steadily in recent years particularly in orthopaedic, dental, maxillo-facial and neurosurgery where there is a need to replace missing bone and enhance bone formation. Currently, bone autograft is the golden standard. Due to limited amounts it can only be used in cases of small defects. The harvesting procedure poses substantial risks for long term pain and discomfort with a risk of infection and nerve lesion. Alternatives such as bone allografts are associated with risks of transferring blood borne diseases, e.g. HIV and various kinds of hepatitis. There are also problems with donor matching, storage and high costs of manufacturing. In the light of these factors, the use of Synthetic Bone Graft Materials (SBGM) is very attractive. There is particular interest in developing engineered SBGM which can be used as scaffolds for seeding cells and transplanted back in the body. This can enhance fixation and integration of the implant by encouraging bone in-growth and provide a viable alternative for load-bearing and non load-bearing osseous defects such as joints and maxillo-facial reconstruction.

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F	Institut National Polytechnique de Toulouse
F	ORTHOPEDIE BIOMECHANIQUE LOCOMOTION
UK	HI-POR CERAMICS
UK	QUEEN MARY AND WESTFIELD COLLEGE
I	FIN-CERAMICA FAENZA s.r.l.
DK	Aarhus University Hospital

Growth Programme - RTD

Title :

PRODUCTION OF CARBON NANO-PARTICULES, RANGING FROM FULLERENES OVER NANO-TUBES TO CARBON BLACK AND GRAPHITE, USING A PLASMA TECHNOLOGY AND THEIR EVALUATION IN DIFFERENT DOMAINS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10617

Project Acronym PLASMACARB

Contract Reference G5RD-CT-1999-00173

EC Project officer T.AGELADARAKIS

Abstract :

Plasma technology has been investigated in the frame of new production processes for carbon blacks and graphite. Although proven feasible, work remains to be done on the development of high quality materials. It has been proven by some of the partners that fullerenes can be produced on this equipment and probably also nano-tubes. The present project covers the development of a plasma production technology for carbon nano-particules ranging from carbon black, over fullerenes to nano-tubes. In the frame of this project those new materials, especially fullerenes and nano-tubes will be made available in sufficient quantities to partners for evaluation and application development. The application fields covered are: electrochemistry, polymers, organic synthesis and hydrogen storage.

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D	DEUTSCHES INSTITUT FÜR KAUSCHUKTECHNOLOGIE e.V.
B	Université Catholique de Louvain
F	Centre National de la Recherche Scientifique
NO	Norwegian Institute of Technology
B	ERACHEM EUROPE
D	Merck KGaA
B	Université Catholique de Louvain
FIN	PREMIX OY

Growth Programme - RTD

Title :

BILAYER MOLECULAR COATINGS FOR ELECTRICAL CONTACT IMPROVEMENT

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10622**Project Acronym** BILAYER MOLECULAR**Contract Reference** G5RD-CT-1999-00226**EC Project officer** S. BECKER

Abstract :

This proposal is about the elaboration of a permanent organic coating for electrical contacts that diminishes the degradations due to friction and corrosion . The aim is to significantly improve performances and reliability of contacts used in the very competitive fields of automotive and telecom industries. Liquid lubricants are prone to depletion and thus not sufficient: an efficient protection has to be permanent. A new type of bilayer is proposed: a grafted layer and a free one , the two films consisting of similar molecules for an optimised interaction . Coated connector terminals will be tested with the standardized industrial specifications .

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B	Facultés Universitaires Notre-Dame de la Paix
F	Université de Nice Sophia Antipolis
F	FCI France

Growth Programme - RTD

Title :

ECONOMICAL AND SAFE DESIGN OF PRESSURE VESSELS APPLYING NEW MODERN STEELS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10640

Project Acronym ECOPRESS

Contract Reference G5RD-CT-1999-00128

EC Project officer P.MERIGUET

Abstract :

Pressure vessels (PV) business is a world wide market. This challenge to the European PV-industry may be encountered by a research strategy focussing on the utilisation of new advanced steels and improved and safe design. High strength and high toughness steels with, in case of DUPLEX, even excellent corrosion resistance and good weldability are available from the developments of European steel industry during the past 3 decades. Only today the European design rules for PV-design practically exclude these steels from application because of missing design technologies. The research projet will therefore work out conditions to remove obstacles and unnecessary conservatism by applying modern design by analysis methods for the full exploitation of properties of the new steels. The works will cover the full range from design to fabrication, testing and operation of PV. Recommendations will be derived that will allow more economical design.

Coordinator

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F	CMP DUNKERQUE
E	FUNDACION ITMA
F	Creusot-Loire Industrie
D	University of Stuttgart
D	PSP - Prof. Sedlacek & Partner Technologien im Bauwesen GmbH
D	Ingenieurbuero fuer Werkstofftechnik
D	AG der Dillinger Huettenwerke
S	KUNGLIGA TEKNISKA HOGSKOLAN
FIN	Rautaruukki Oyj
FIN	Technical Research Centre of Finland
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EL	University of Patras
D	Rheinisch-Westfaelische Technische Hochschule Aachen
E	FELGUERA CALDERERIA PESADA, S.A.
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Growth Programme - RTD

Title :

FUNCTIONAL OXIDE STRUCTURES FOR ADVANCED MICROWAVE SYSTEMS

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10643**Project Acronym** FOAMS**Contract Reference** G5RD-CT-1999-00201**EC Project officer** B. TUBBING

Abstract :

Microwave systems play a key role for the global society of the next millennium with applications from terrestrial and satellite communication including software Radio, UMTS, GPS and DBS TV to environmental monitoring from satellite and future systems connecting phone networks for car and aircraft navigation.

Improved microwave components based on dedicated materials & new designs are required. The materials, combinations and structures to be investigated are the following :

- dielectric ceramics & crystals with low loss at low temperature & R.T.
- ferroelectric/superconductor heterostructures for electronic frequency tuning
- photonic dielectric structures: high Q & tailored temperature coefficient.

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UK	NPL Management Ltd
D	Institut fuer Mobil-und Satellitenfunktechnik GmbH
F	Centre National de la Recherche Scientifique
F	THOMSON CSF
F	Tekelec Temex
D	FORSCHUNGSZENTRUM JUELICH GMBH
F	ALCATEL SPACE INDUSTRIES
UK	South Bank University

Growth Programme - RTD

Title :

DEVELOPMENT OF ALUMINA FORMING ODS FERRITIC SUPERALLOYS AS NEW BIOMATERIALS FOR SURGICAL IMPLANT

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10659

Project Acronym ALUSI

Contract Reference G5RD-CT-1999-00083

EC Project officer S. BECKER

Abstract :

The aim of this project is to develop alumina forming alloys (Fe-Cr-Al-Y2O3) with improved wear resistance as new biomaterials for surgical implants (hip/knee). The proposal is based on their unique capability to develop a fine but hard, dense, and very well adherent alpha-alumina layer by thermal oxidation. The starting material is a commercial alloy designed for high temperature applications. Thus this project gives priority to optimise its processing, in order to get the correct texture (low Young's Modulus and small grain size), the composition, and the thermal oxidation conditions. Mechanical characterization of developed alloys includes tensile, compressive, fatigue, and wear tests simulating joint wearing conditions. Bio-compatibility is assessed by corrosion experiments in simulated human fluids and cell culture on solid specimens. The influence of wear debris and ions release on the cell culture will also be investigated.

Coordinator

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E	SURGIVAL, CO, S.A.
D	Technische Universität CLAUSTRAL
I	European Commission - Joint Research Centre
I	ISTITUTI ORTOPEDICI RIZZOLI
E	Asociacion Instituto de Biomechanica de Valencia

Growth Programme - RTD

Title :

A NEW GENERATION OF CUTTING TOOLS BASED ON FUNCTIONALLY GRADED SIALONS FOR SOLVING THE MACHINING PROBLEMS OF THE 21st CENTURY

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10667

Project Acronym FGMSIATOOOL

Contract Reference G5RD-CT-1999-00221

EC Project officer C. LESNIAK

Abstract :

New ceramic tool materials on the basis of Silicon Nitride/Oxide ("Sialons") with a tough core should be developed, to allow a significantly higher performance in machining, in particular for "heavy-to-machine-parts". Together with the inserts to be developed, characterised and tested, a suitable cutting technique is to be found with the end-users. Two research centers will collaborate with two European end-users, one industrial specialist for ceramics, and one SME which will assist with computer simulation. The output should enable the European machining industry to increase and speed up the production combined with saving of resources and should benefit for health and environment.

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Gammastamp Spa

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Growth Programme - RTD

Title :

PREDICTION OF THE LIFE TIME BEHAVIOUR FOR C/C-SIC TUBES AT HIGH AND ULTRAHIGH TEMPERATURE HEAT EXCHANGERS

Generic activity MAT

Duration : 45 months

Proposal Reference GRD1-1999-10672

Project Acronym HITHEX

Contract Reference G5RD-CT-1999-00218

EC Project officer D.GILLIAERT

Abstract :

The project will be used to demonstrate the applicability of structural CMC components for high and ultra high heat exchangers. Such heat exchangers are required to realize new power generation plants based on External Fired Combustion Cycles (EFCC) or Indirect Fired Gas Turbines (IFGT). The application limits will be determined for different oxidation protected C/C-Sic parts developed in a previous project. Life time behaviour models will be created based on creep curves under different environments. The materials and structural components will be further improved based on the intermediate evaluation. Furthermore, new test methods will be developed, applied and standardized to measure directly on structural components and not only on model samples. The test methods will be evaluated in comparison to standardized tests according EN on samples.

Coordinator

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Partnership

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I	ANSALDO RICERCHE
EL	Integrated Aerospace Sciences Corporation (INASCO)
F	COMMISSARIAT A L'ENERGIE ATOMIQUE
D	Schunk Kohlenstofftechnik GmbH
UK	NEW METALS & CHEMICALS (HOLDINGS) LTD

Growth Programme - RTD

Title :

CATALYST DESIGN AND OPTIMISATION BY FAST COMBINATORIAL ANALYSIS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10696

Project Acronym COMBICAT

Contract Reference G5RD-CT-1999-00022

EC Project officer S. CERVERA MARCH

Abstract :

Global market pressures are driving European chemical industry to reduce R&D cycle times and costs to provide high quality products or new production technologies. The development of new efficient solid catalyst for heterogeneously catalysed reactions often contradicts these requirements as it involves expensive, time consuming steps. In the COMBICAT project the combinatorial approach is used to overcome these obstacles. The set targets are to develop innovative methods for high-speed catalyst preparation, testing and selection. Then these methods are to be used to discover new compound combinations as new and highly performing catalysts for industrially relevant reactions. Better catalysts would result in reduction of energy consumption and undesired side-products. The developed technological concepts and apparatus will be sold as a spin-off through high-tech SME.

Coordinator

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F	Groupement Européen de Recherches Technologiques sur les Hydrocarbures
F	Institut Francais du Petrole
NL	Netherlands Energy Research Foundation
UK	CAMBRIDGE COMBINATORIAL AN OXFORD MOLECULAR COMPANY
I	EniTecnologie S.p.A.
E	UNIVERSITAD POLITÉCNICA DE VALENCIA
F	Centre National de la Recherche Scientifique
NL	DSM NV
D	Institut für Angewandte Chemie Berlin-Aldershof e.V.

Growth Programme - RTD

Title :

HIGH MOULDABLE FIBREBOARD

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10726**Project Acronym** HI-FI**Contract Reference** G5RD-CT-1999-00148**EC Project officer** P. GUERMONPREZ

Abstract :

The objective of HI-FI is the development of an innovative process for the production of fibreboard out of annual plants, leading to a product with greatly enhanced moulding capabilities. HI-FI will minimise the use of resources (wood, energy) and environment impact. The fibreboard produced with this new process will be an environmentally friendly superior quality product based on renewable and sustainable resources. Due to its high quality, HI-FI fibreboard will substitute materials in the automobile industry (moulded internal parts) as well as in the other industrial areas (e.g. decorative mouldable parts). This will improve competitiveness and increase employment in farming, fibreboard production, their end-users, the manufacturers of plant machinery and the suppliers of plant automation. It will also allow for an easy non-polluting disposal and recycling of the product after usage.

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Partnership**Country****Organisations**

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I	ORSI Automazione S.p.A.
D	PAMA Papiermaschinen GmbH
I	PIANFEI Engineering
A	FUNDER Industrie Ges.m.b.H.

Growth Programme - RTD

Title :

TESTING AND ASSESSMENT OF MARBLE AND LIMESTONE

Generic activity MAT**Duration :** 60 months**Proposal Reference** GRD1-1999-10735**Project Acronym** TEAM**Contract Reference** G5RD-CT-1999-00233**EC Project officer** M.C. MAROLDA

Abstract :

All across Europe the long term deformation of marble cladding has resulted in safety and durability problems. This has resulted in increased maintenance costs, and reduced production, export and employment.

The assessment of facades at selected study sites, using monitoring systems, risk assessment and lifetime prediction, will be used to develop hypotheses for the observed deterioration. Repair techniques will be developed for existing buildings, thus reducing maintenance costs for existing problems. Research carried out on a large number of stone types will be used to explain degradation and develop European test methods (CEN/TC 246 Resolution 013/00/1999). The test methods will be used for production control and screening to identify good and deleterious marble and so reduce future damage and promote use of natural stone for cladding, thus improving employment and increasing European competitiveness in this area.

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NO	Norwegian Institute of Technology
DK	RAMBOELL, HANNEMAN & HOEJLUND A/S
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DK	REALKREDIT DANMARK
D	Georg August Universität
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Growth Programme - RTD

Title :

IMPROVEMENT OF SERVICE LIFE AND RELIABILITY OF COLD FORGING TOOLS WITH RESPECT TO FATIGUE DAMAGE DUE TO CYCLIC PLASTICITY

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10748

Project Acronym COLT

Contract Reference G5RD-CT-1999-00067

EC Project officer M.FALZETTI

Abstract :

Cold forging is the most efficient technology for mass production of high precision parts for transport, mechanical and electrical industries. There is a large potential for reducing the production costs in this industry by improving reliability of tools. The optimisation potential relies on enormous scatter of tool life, which is currently encountered in the production. This is because cold forging tools operate under extreme conditions where slight variations in process load and material strength have a strong impact on tool failure. The main objective of this project is to develop a methodology to increase tool life and to reduce its scatter.

Key problems are related to fundamental understanding of the deterioration mechanisms, identification of stochastically relevant process parameters and introduction of such technological modifications in steel making, tool manufacturing and cold forging which will lead to more economical production.

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DK	Danfoss A/S
UK	Rockfield Software Limited

Organisations

Growth Programme - RTD

Title :

ECOTISSUE BY GAS PHASE SURFACE MODIFICATION OF LIGNOCELLULOSIC FIBRES

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10789

Project Acronym ECOTISSUE

Contract Reference G5RD-CT-1999-00136

EC Project officer P. GUERMONPREZ

Abstract :

This project is directed towards the manufacture of tissue products with enhanced wettability, absorbancy, storage duration and human contact friendliness. The innovative feature of the project consists on the attempt to shift from wet chemistry to dry gas phase-chemistry, thus minimising use of chemicals, of water, of energy and produced waste. Lignocellulosic fibres and tissue plies will be surface modified to obtain the required functionalities and properties. Surface modification will be conducted under electrical discharge conditions in nitrogen containing active gas additives. Two types of electrical discharges will be used. The well known Dielectric Barrier Discharge and the Micro Hallow Glow Discharge. The later will be developed and used in this area for the first time within this project.

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F	BIOPHY RESEARCH S.A.
S	Chalmers University of Technology AB-
D	SOFTAL electronic Erik Blumenfeld GmbH & Co

Growth Programme - RTD

Title :

DESIGN OF NEW ENVIRONMENTALLY FRIENDLY SELF-ADHESIVE MATERIALS

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10798**Project Acronym** DEFSAM**Contract Reference** G5RD-CT-1999-00202**EC Project officer** T.K. TUORI

Abstract :

Self-Adhesive Materials, or Pressure-Sensitive-Adhesives (PSA), are progressively replacing other types of glues for most non-structural bonding applications due to their safe and easy handling. However, the empirical strategy which has been used for the development of a first generation of products is no longer sufficient to solve existing problems, particularly as environmental and health regulations restrict the use of harmful solvents in chemical processing. The understanding of the reasons why self-adhesives stick using modern scientific tools and methods probing mechanisms at the microscopic and molecular level will be developed. The PSA, the design of a new testing method to probe instant adhesion (tack) and a software tool able to predict the properties of a PSA from the molecular structure of its components, will be developed.

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D	BEIERSDORF AG
F	Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris
E	UNIVERSIDAD POLITECNICA DE MADRID

Growth Programme - RTD

Title :

PREDICTIVE THROUGH PROCESS MICROSTRUCTURAL MODELLING OF ROLLING AND EXTRUSION OF ALUMINIUM ALLOYS FOR CLIENT ORIENTED AND FLEXIBLE

Generic activity MAT **Duration :** 48 months
Proposal Reference GRD1-1999-10841 **Project Acronym** VIRFAB
Contract Reference G5RD-CT-1999-00132 **EC Project officer** HL. SCHMIDT

Abstract :

The European aluminium manufacturing industry can only keep its present competitiveness if it can provide superior quality. Furthermore, the industry is obliged to produce with minimal environmental impact. To date, specific processing conditions are optimised on a piecemeal basis using specific models. Full optimisation can only be reached when the combined influence of all the processing parameters during fabrication is known. To make this knowledge applicable it is necessary that it is put in the form of a linked model, a Through Process Model. Such a TPM will provide the industry with a way to tune their processing route and thus their products towards the specific demands of their customers. Optimisation and intelligent processing will lead towards zero waste production and widen the possibilities to use alloys produced using a higher fraction of recycled aluminium. It is expected that this project will generate direct economic advantage of 154 MEURO. The indirect advantage for the whole EU will be even larger.

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S	Gränges AB
NO	SINTEF
S	Swedish Institute for Metals Research
NL	Foundation Netherlands Institute for Metals Research
NL	Hoogovens Corporate Services B.V.
F	ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET
UK	University of Sheffield
D	Aachen University of Technology
NO	Norwegian University of Science and Technology
UK	Alcan International Limited

Growth Programme - RTD

Title :

IMPROVEMENT OF CONSTRUCTION MATERIALS USED IN THE FOOD INDUSTRY TO LENGTHENING PROCESSING TIME

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10856

Project Acronym MODSTEEL

Contract Reference G5RD-CT-1999-00066

EC Project officer E. NAEGELE

Abstract :

Fouling of processing equipment upon heating is one of the major problems in the dairy industry as deposit formation limits the desired heat transfer required for the microbiological safety of the product, reduces the flow and leads to pressure build up, whereas bacterial adhesion in the cooling section can lead to post-pasteurisation microbial contamination. Cleaning at regular intervals is essential to overcome these problems. However, this requires interruption of processing, use of cleaning agents and large amounts of rinsing water, all attributing negatively to the cost of a process and leading to environmental problems. The aim of the project is to minimise fouling and to reduce cleaning by altering the surface properties of the heating surface, i.e. steel, to make it less attractive for the fouling components.

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F	GROUP DANONE
F	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE
S	Avesta Sheffield AB
F	Ugine SA

Growth Programme - RTD

Title :

INTEGRITY OF REPAIR WELDS IN HIGH TEMPERATURE PLANT OPERATING UNDER STEADY AND CYCLIC LOAD CONDITIONS

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10886

Project Acronym INTEGRITY

Contract Reference G5RD-CT-1999-00118

EC Project officer R. GAMBI

Abstract :

The project is an effort to understand behaviour and predict performance of repair welds in high temperature plants. A methodology for assessing high temperature components containing repair welds is being developed on the base of a scientific foundation for understanding and predicting creep/fatigue crack behaviour in repair welded components and finite element models for relating microstructure and properties of the repair weld region to the behaviour of components. Various situations of repair welds and four materials (ferritic, austenitic and martensitic steels) are being studied. Sophisticated FE modelling techniques encapsulating the complexities of repair welds and a number of lab and feature tests to validate FE models are used to produce an integrated remaining life assessment methodology and guidelines for the use of crack assessment procedures. This includes relations to NDT findings and consideration of residual stresses.

Coordinator

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NL	European Commission - Joint Research Centre
D	Siempelkamp Prüf-und Gutachter-GmbH
UK	European Technology Development Ltd
UK	University of Bristol
I	ENEL
US	Georgia Tech Research Corporation
P	MANUTENCAO E INTEGRIDADE ESTRUTURAL, LDA

Growth Programme - RTD

Title :

LOW-COST ALL-POLYMER INTEGRATED CIRCUITS FOR LOW-END HIGH-VOLUME IDENTIFICATION APPLICATIONS

Generic activity MAT

Duration : 24 months

Proposal Reference GRD1-1999-10903

Project Acronym PLASTRONIX

Contract Reference G5RD-CT-1999-00011

EC Project officer B. TUBBING

Abstract :

There is a need for contactless readable electronic barcodes for identification and product tagging. The applications range from electronic article surveillance, identification tags for retail, anti counterfeit devices to access control, airline luggage tracking and recycling. Present transponders made with regular ICs are too expensive. A cost price reduction by an order of magnitude is required. Polymers are associated with low-cost due to their ease of processing. Recently, the first all-polymer integrated circuits and functional transponders have been realised. Apart from low-cost they offer considerable environmental advantages. The target of this 2 year research project is to design and control a manufacturing process for the polymeric semiconductor, and to develop an industrial process technology for flexible polymeric integrated circuits. This project will open the new emerging field of polymer electronics.

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LIMBURGS UNIVERSITAIR CENTRUM

PHILIPS SEMICONDUCTORS GmbH

Growth Programme - RTD

Title :

PREDICTIVE 3D MICRO-MODEL SIMULATIONS FOR MONITOR LCDs

Generic activity MAT

Duration : 31 months

Proposal Reference GRD1-1999-10904

Project Acronym MONLCD

Contract Reference G5RD-CT-1999-00115

EC Project officer A. MARTIN HOBDEY

Abstract :

To keep and extend Europe's knowledge in the field of active-matrix liquid-crystal displays (LCDs) the project will develop a method to improve the quality in terms of transmission efficiency, viewing angle and speed. The functional opto-electronic materials in these devices are liquid crystals (LCs). Several LC effects can be applied in displays. Beforehand it is not clear which effect is the most useful. The project will do predictive calculations based upon three dimensions (3D) going much further than the state of the art with only one-dimensional tools. A major step forward results from full 3D finite-element modelling of the director pattern and a 3D description of the optics and the ion distribution. Prototype software based will be used to obtain theoretical results and to compare them with experiments. Based on the above findings LCD test displays will be made. It is the intention of the consortium to use them as starting points for further development of new monitor displays.

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Growth Programme - RTD

Title :

SUPERSTRONG TRANSPARENT ALUMINIA CERAMICS FOR ENERGY-EFFICIENT LIGHTING

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10909

Project Acronym STARELIGHT

Contract Reference G5RD-CT-1999-00088

EC Project officer T.AGELADARAKIS

Abstract :

The main objective is the development of significantly improved alumina ceramics with an extremely reduced grain size, having the following properties: very high mechanical strength (approx. 700 MPa instead of approx. 300 MPa now), high transparency (conventional alumina ceramics is only translucent or opaque), improved corrosion resistance (e.g. against metal halides), having a complex hollow shape (now only cylindrical shapes are possible). The improved material will solve problems in existing applications (e.g. metal halide lamps) and will lead to new applications such as scratch-resistant windows for bar-code scanners (now sapphire). Metal halide lamps with improved alumina ceramics will enable to replace energy-wasting halogen lamps on a larger scale which is not possible now. This can lead to substantial energy savings up to 7 billion KWh in Europe which correspond to one big power station of 4.5 million tons CO₂.

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BODYCOTE IMT N.V.
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Growth Programme - RTD

Title :

NEW JOINING TECHNIQUES FOR LIGHT MAGNESIUM COMPONENTS

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-10918**Project Acronym** MAGJOIN**Contract Reference** G5RD-CT-1999-00134**EC Project officer** HL. SCHMIDT

Abstract :

The objective of the Magjoin project is to develop a suitable joining technology for magnesium components and for aluminium-magnesium joints to overcome problems of fragile failure of the joints due to metallurgical and technological aspects. Magnesium is ideally suited for die casting and net shapes are obtainable. The major obstacle which prevents a further use of magnesium is the difficulty of joining die as parts among them and with components of different materials. This difficulty prevents using magnesium for parts too large to economically cast a single piece. The project aims is to develop a new welding process based on laser melting of special powders as filler material to solve metallurgical problems, extend of special powders as filler material and extend results to arc welding. Friction welding is also promising in joining of different materials and then will be investigated in this project.

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I	Centro Ricerche Fiat - Società Consortile per Azioni
UK	The Welding Institute
FIN	Lappeenranta University of Technology

Growth Programme - RTD

Title :

NOVEL SPS PROCESSING OF NANOSCALE CERAMICS FOR INDUSTRIAL AND BIOMEDICAL APPLICATIONS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10919

Project Acronym SPARKCIBA

Contract Reference G5RD-CT-1999-00052

EC Project officer S. BECKER

Abstract :

The proposal is motivated by the availability of a novel ceramic sintering process (Spark Plasma Sintering) which enables densification of components in short times, purity, nanoscale grain size and potentially high strength. The process will be applied to pure oxide biomedical ceramics, to develop high strength femoral heads with fine surface finish and to metal cutting inserts with carbide or nitride dispersions in oxide matrices which have high toughness, wear resistance and low reactivity with important alloys. The objective is to develop an economic manufacturing route for oxide components which have large property increments over existing products, to facilitate EU competitiveness and international market penetration.

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STOCKHOLM UNIVERSITY

CENTRO DE ESTUDIOS E INVESTIGACIONES TECNICAS DE GUIPUZCOA

Growth Programme - RTD

Title :

THE "VIRTUAL CAST HOURS", DEVELOPMENT OF A PROCESS CHAIN MODEL OF ALUMINIUM DIRECT CHILL CASTING OF TAILORED PRODUCTS

Generic activity	MAT	Duration :	48 months
Proposal Reference	GRD1-1999-10921	Project Acronym	VIRCAST
Contract Reference	G5RD-CT-1999-00153	EC Project officer	HL. SCHMIDT

Abstract :

The project aims at providing European aluminium producers with a powerful tool, the "Virtual Cast House", a process chain model, which will make process optimisation in the cast house more efficient and economical. With this tool the cast houses keep their present competitiveness by providing tailored products of superior quality to its customers with minimum environmental impact on the European society. It will be the tool to give the cast houses the means to change the metal basis of high quality products from a primary metal alloy system to a more recycled material base. The project brings together six major European aluminium producers, six leading universities and research institutes and one software developer. Fully integrated models will be developed for hot tearing and microstructure development during casting and homogenisation, which are the phenomena that determine the productivity and product quality. The models will be verified by laboratory and full-scale experiments.

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CH	Alusuisse Lonza Group Ltd
F	Institut National Polytechnique de Lorraine
CH	CALCOM S.A.
CH	Ecole Polytechnique Federale de Lausanne
NO	Elkem ASA
NO	HYDRO ALUMINIUM
F	Institut National Polytechnique de Grenoble
NL	Hoogovens Corporate Services B.V.

Growth Programme - RTD

Title :

ECOEFFICIENT TECHNOLOGIES AND PRODUCTS BASED ON NATURAL FIBRES COMPOSITES

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-10951

Project Acronym ECOFINA

Contract Reference G5RD-CT-1999-00147

EC Project officer P. GUERMONPREZ

Abstract :

The aim of this research is the substitution of mineral fillers and fibres presently used in automotive parts made with organic matrices, by natural (NF). This substitution will allow for the production of vehicle components with potentially complete recyclability. Moreover, the attainable lower weight due to the low density of the NF will enhance the quality of life due to the lowering of gas emission. The project is organised to develop new materials, fillers, and process, which will lead to the application of a new and environmental friendly. Many advantages are foreseen from the development of such material: the total recyclability, the lower CO2 consumption during the whole lifecycle. The expected results will be new composite systems based on both thermoplastic and thermoset reinforced with natural fibers, whose application and feasibility will be demonstrated through the production of prototypes.

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FIN	FINFLAX LTD
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S	SAAB Automobile AB
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I	Università di Perugia
E	F.P.K, S.A.
E	UNIVERSIDAD DEL PAIS VASCO / EUSKAL HERRIKO UNIBERTSITATEA

Growth Programme - RTD

Title :

THE REPLACEMENT OF HARD CHROMIUM COATINGS FOR MECHANICAL COMPONENTS THROUGH HIGH PRESSURE NANO STRUCTURE POWDER HVOF COATINGS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10986

Project Acronym NANO-HVOF

Contract Reference G5RD-CT-1999-00231

EC Project officer S. BECKER

Abstract :

The "problem solving" of this proposal is the replacement of hazardous hard chromium plating technology used today in the industry to coat different type of critical mechanical components (valves, pistons, piston rings, rods, hydraulic components) with an efficient and economic "clean" HP-HVOF technology using micro and nano-powders to avoid also the blasting and regrinding operations necessary today to use the plasma spray coatings.

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C.R.F. SOCIETA' CONSORTILE PER AZIONI

Growth Programme - RTD

Title :

CARBON NANOSTRUCTURES AND NANOTUBES FOR ENERGY STORAGE, ELECTROCHEMISTRY AND FIELD EMISSION APPLICATIONS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-10989

Project Acronym CARBEN

Contract Reference G5RD-CT-1999-00027

EC Project officer B. TUBBING

Abstract :

The objective of this project is to develop carbon nanotubes and nanostructured carbon with huge surface areas for use in electrochemistry, energy storage, transport and electron field emission. The carbon will enable Montena to manufacture 1 kiloFarad supercapacitors for hybrid power supplies for electric vehicles, enable National Power to greatly improve the voltage efficiency in its bulk electricity storage technology, and will provide improved electron emitters for field emission display technology. Microcoat will scale-up a room temperature deposition process to implement the deposition technology.

Coordinator

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NATIONAL POWER PLC

University of Cambridge

Growth Programme - RTD

Title :

DEVELOPMENT OF NEW METHOD TO CHARACTERIZE THE DURABILITY OF STAINLESS STEELS TO CREVICE ATTACK IN NATURAL AND TREATED SEAWATERS

Generic activity MAT **Duration :** 36 months
Proposal Reference GRD1-1999-11039 **Project Acronym** Crevcorr
Contract Reference G5RD-CT-1999-00139 **EC Project officer** E. NAEGELE

Abstract :

The project will develop a new test method to characterize the susceptibility of stainless steels to crevice attack in natural and treated seawaters. For many industry sectors crevice corrosion of stainless steels represents a problem both cost-, safety- and environmentally wise. A new test method for qualification of materials will give a significant contribution to the establishment of safe operational limits of different stainless steel alloys and provide manufacturers and users with a tool which reliably and efficiently reveals possible durability effects of marginal material qualities. The new test method will therefore represent a qualification scheme for passive materials and alloys making it possible for manufactures to qualify materials and users to make durable materials selections. The new test method will be sought to be adopted by ISO.

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Partnership

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NL	Netherlands Organization for Applied Scientific Research (TNO)
NL	Shell International Oil Products B.V.
NO	Norwegian Institute of Technology
F	COMMISSARIAT A L'ENERGIE ATOMIQUE
NO	DET NORKSE VERITAS AS
DK	FORCE Institute
I	Consiglio Nazionale delle Ricerche (CNR)

Growth Programme - RTD

Title :

LIGHT WEIGHT FeAl INTERMETALLIC ALLOY FOR HIGH EFFICIENCY COMPONENTS IN TRANSPORTATION AND POWER GENERATION INDUSTRIES.

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-11064

Project Acronym FIAC

Contract Reference G5RD-CT-1999-00070

EC Project officer HL. SCHMIDT

Abstract :

This project aims at developing the use of light FeAl intermetallic alloys in substitution to steels and nickel alloys in transportation and power generation industries. Recent works (mainly in Europe) have allowed to solve the traditional problems that have limited the use of these materials until now. Today a European reference alloy is produced at laboratory scale. In this project, industrial manufacturing routes (powder metallurgy, forging...) will be developed. Components will be manufactured then tested in actual conditions. This fabrication will also be evaluated in economical terms. The use of FeAl in substitution to steels and nickel alloys will allow to enhance the efficiency of engines and power generation systems, to reduce weight and thus limit fuel consumption and to improve direct operating costs. Environmental friendliness will be improved through the reduction of pollutant emissions, the reduction of vibrations and external perceived noise, the saving of resources in strategic materials such as nickel and chromium and the limitation of their use as they are now recognized as dangerous for health.

Coordinator

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F	AEROSPATIALE CCR
I	ANSALDO RICERCHE
D	PLANSEE GmbH
E	Consejo Superior de Investigaciones Cientificas
F	ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPMENT DES METHODES ET
D	Rheinisch-Westfaelische Technische Hochschule Aachen
I	C.R.F. SOCIETA' CONSORTILE PER AZIONI
F	COMMISSARIAT A L'ENERGIE ATOMIQUE

Growth Programme - RTD

Title :

HIGH PERFORMANCE APPROACH TO FATIGUE CRACK ANALYSIS AND LIFE PREDICTION

Generic activity MAT**Duration :** 36 months**Proposal Reference** GRD1-1999-11077**Project Acronym** HIPER-CRACK**Contract Reference** G5RD-CT-1999-00204**EC Project officer** T.AGELADARAKIS

Abstract :

The purpose of the proposed research is the development of advanced computational tools that will predict fatigue crack initiation subsequent growth and net loss of structural strength, thus completing the entire phase of damage tolerance analysis. The analysis is based on the finite element method and is a direct improvement of the current practice that treats life prediction as a postprocessing problem. The proposed methodology incorporates the principles of fracture mechanics throughout the analysis loop and specifically takes into account the physics of the decohesion process. A variety of industries will be potential users of the proposed capability including aircraft, automotive, ship, nuclear, defense and infrastructure. The proposal includes three end-user applications in the automotive, aerospace and civil engineering fields as well as adaptation within high performance parallelised commercial software environments.

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I	European Commission - Joint Research Centre
B	SAMTECH S.A.
I	C.R.F. SOCIETA' CONSORTILE PER AZIONI
I	ALPHARD SOCIETA A RESPONSABILITA LIMITATA
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EL	INSTITUTE OF ENGINEERING SEISMOLOGY AND EARTHQUAKE ENGINEERING
UK	NCODE INTERNATIONAL LTD

Growth Programme - RTD

Title :

ACTIVE CONTROLLED TRANSDERMAL DRUG DELIVERY SYSTEMS

Generic activity MAT**Duration :** 48 months**Proposal Reference** GRD1-1999-11098**Project Acronym** ACTRADEL**Contract Reference** G5RD-CT-1999-00077**EC Project officer** U. FAURE

Abstract :

The proposal aims to develop functional materials and systems to fulfil the need for safe, actively controlled transdermal drug delivery. The effective combination of the partner's skills and resources will develop drug delivery systems to meet several patient centred objectives: e.g. wider use of self administered drugs, at home with a wearable system, more accurate matching of drug dose to drug need, avoiding side effects and long-term complications in chronic diseases (e.g. diabetes and osteoporosis) and improve patient compliance by replacing self injection. This project seeks to extend the scale and range of drugs currently administered non-invasively-e.g. beyond small scale anaesthetics and pain killers. The economic impact is to reduce hospitalisation, reduce use of PVC consumables and develop a new sector of European health industry .

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IL	ELECTROBIO MEDICAL (ISRAEL) LIMITED
UK	University of Nottingham
NL	University of Twente
NL	Leiden University

Growth Programme - RTD

Title :

NEW SURFACE MODIFIED FLAME RETARDED POLYMERIC SYSTEMS TO IMPROVE SAFETY IN TRANSPORTATION AND OTHER AREAS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-11121

Project Acronym FLAMERET

Contract Reference G5RD-CT-1999-00120

EC Project officer H. MCBRYAN

Abstract :

The extensive use of polymers increases fire hazard. Harmful gases may also evolve at burning causing environmental damage . The integrated activity of universities , research institute , regulatory body , SMEs and user , from two EU countries plus two associated ones , concentrate on development and production of a new high performance recyclable and low-cost halogen free flame retarded product family, demonstration of its applicability in the area of transport and dissemination of the results in various application fields and countries. The innovation includes synthesis, encapsulation of flame retardant particles, formation of nanocomposite structure and of nano - sized protective layer, which can be applied in advanced reactive manufacturing processes of flame retarded extended lifetime interior vehicle elements and other products of increased safety . Improvement is expected in safety, cost, recyclability, toxicity and lifetime.

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HU	PLC FOR QUALITY CONTROL AND INNOVATION IN BUILDING
F	CENTRE DE RECHERCHE ET D'ETUDES SUR LES PROCEDES D'IGNIFUGATION DES
PL	ZAKLAD DOSWIADCZALNY ROSZARNICTWA BAST FIBRES RETTING FACTORY
HU	RATI Autofelzereles KFT
HU	PEMÜ-PLASTIC PROCESSING CO ITD
HU	IKARUS VEHICLE MANUFACTURING LTD
HU	Technical University of Budapest
PL	INSTITUTE OF NATURAL FIBRES
HU	Hungarian Academy of Sciences

Growth Programme - RTD

Title :

NOVEL PERMANENT MAGNETS FOR HIGH TEMPERATURE APPLICATIONS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-11125

Project Acronym HITEMAG

Contract Reference G5RD-CT-1999-00213

EC Project officer B. TUBBING

Abstract :

The aim of this project is the development of new magnetic materials and prototype devices for high temperature applications i.e. up to 450°C working temperature. New standards and measurement protocols will also be developed and defined for high temperature permanent magnets. The discovery of high-performance NdFeB magnets in 1983 has led to an extraordinary development of permanent magnet applications. The annual global production of these materials is presently over 10000 tonnes. The properties of these materials however rapidly degrade as temperature is increased and they cannot be used above 150°C-180°C. From these temperatures and up to 300°C, the Sm(Co,Cu, Fe, Zr) magnets are preferred to the NdFeB. Above this temperature, no material is available although important potential applications exist in the fields of aeronautics, the space (satellite) industry, electronics, and the automotive (petrol and electric) industry.

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Partnership

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SI	Jozef Stephan Institute
IRL	Trinity College Dublin
CY	FREDERIK INSTITUTE OF TECHNOLOGY
UK	LESS COMMON METALS LTD
UK	University of Birmingham
D	Institute for Solid State and Materials Research Dresden
CH	UGIMAG AG
D	Magnetfabrik Bonn GmbH
EL	National Center for Scientific Research "Demokritos"
A	Technical University of Wien

Growth Programme - RTD

Title :

Postpone polymer processing instabilities

Generic activity MAT**Duration :** 48 months**Proposal Reference** GRD1-1999-11134**Project Acronym** 3PI**Contract Reference** G5RD-CT-2000-00238**EC Project officer** T.K. TUORI

Abstract :

The objective of the 3PI project is to develop a rational approach to link the viscoelastic properties of the polymer, the boundary conditions at the die wall and the processing conditions to the appearance and the development of the flow instabilities. This rational approach will result in software codes which will be able to provide guidelines for polymer producers and for polymer converters and machinery equipment industry to modify the polymer, the die geometry and (or) the die material in order to overcome (postpone) these instabilities. This will allow polymer producers to reduce by 10% the time to market for a polymer dedicated to a specific process. This will allow polymer converters to postpone polymer processing instability by 20% (which means increasing the flow rate at which defects are appearing by 20%).

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D	Dyneon GmbH
E	REPSOL PETROLEO, S.A.
NL	DOW BENELUX N.V.
F	Centre National de la Recherche Scientifique
UK	University of Cambridge
EL	ARGO S.A.
D	Friedrich-Alexander-Universität Erlangen-Nurnberg

Growth Programme - RTD

Title :

INDUSTRIAL NOVELTY DAMPERS BY DEVELOPMENT OF ADVANCED OF ADVANCED MATERIALS WITH HIGH PERFORMANCE UNDER ELECTROMAGNETIC RHEOLOGICAL STIMULATION

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-11139

Project Acronym IND-DAMPERS

Contract Reference G5RD-CT-1999-00125

EC Project officer T.AGELADARAKIS

Abstract :

The project addresses the distributing vibrations to man, machinery and structures for reasons of safety, comfort, reliability and for gaining a competitive edge, as it aims at developing a generic technology for the manufacture of purpose-oriented high-performance magnetorheological materials, and to demonstrate their validity through the design and construction of semi-active, real-time controllable dampers. When successful, these innovative systems could be widely used. These dampers require little energy to operate and are by definition fail-proof since in case of failure a passive component is always present. The work will encompass defining the semi-active requirements, proceed over numerical modelling and prototype development to a phase of up-scaling and performance validation.

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Technical Research Centre of Finland

FUNDACION GAIKER

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PRECIMA DEVELOPMENT AB

Growth Programme - RTD

Title :

DEVELOPMENT OF THE NEW SEGMENTED FLOW TUBULAR REACTOR (SFTR) FOR POWDER SYNTHESIS IN AN INDUSTRIAL PILOT PLANT

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-11140

Project Acronym SFTR

Contract Reference G5RD-CT-1999-00123

EC Project officer S. CERVERA MARCH

Abstract :

The scale up of powder synthesis is an important problem in the chemical industry. This scale-up can take about 30% of the time to market of a new product and both the yield and quality (particle size distribution and the purity) of the products decrease in this step. In order to solve this problem and to produce highly controlled powders, which will open avenues for new high tech materials, a new approach to processing is proposed: the scale out of the SFTR (segmented flow tubular reactor). The SFTR works continuously with the advantage of mini reaction volumes. It will use a combination of micro-, mini-, and macro-technology to reduce the time to market for a new product using the scale-out concept. At the end of the project, a pilot plant should be built with a predictive modelling software, and three very different powder products will illustrate the versatility of the process.

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University College London

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Ecole Polytechnique Federale de Lausanne

Institut für Mikrotechnik Mainz GmbH

Kemgas Ltd.

Consiglio Nazionale delle Ricerche (CNR)

Growth Programme - RTD

Title :

DEVELOPMENT OF INSULATION MATERIALS WITH SPECIALLY DESIGNED PROPERTIES FOR BUILDING RENOVATION

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-11149

Project Acronym InsuMat

Contract Reference G5RD-CT-1999-00197

EC Project officer M.C. MAROLDA

Abstract :

The moisture-protection of old buildings in the frame of renovation measures and the need to reduce the energy consumption and CO₂-emission require an upgrade of the hygro-thermal properties of insulation systems. The project aims at a directed design of hygro-thermal material properties of insulation system, requiring a continuous interchange of material and information between the material producers, the laboratories and the simulation working group. The simulation group will study and optimise the material behaviour for different construction types and natural climatical conditions. The design methodology will be validated for adjusted transient climatical conditions by NONSTAT-climatic chamber measurements. Insulation systems based on the new developed materials will be tested on functionality using objects to be renovated in the frame of the project.

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CZ	BAU PLUS A.S.
D	Technical University of Dresden
SK	Slovak Academy of Sciences
CZ	Karlomix Bohemia, s.r.o.
SK	Terranova - Industria, Ltd.
PL	POLISH ACADEMY OF SCIENCES
PL	EASY TEST sp. Lublin

Growth Programme - RTD

Title :

NOVEL TECHNOLOGIES FOR SOFT TISSUE RECONSTRUCTION: A TISSUE ENGINEERING SOLUTION BASED ON BIOCOMPATIBLE POLYMERS AND ADIPOCYTES-PRECURSORS CELLS

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-11159

Project Acronym Adipo-regeneration

Contract Reference G5RD-CT-1999-00111

EC Project officer U. FAURE

Abstract :

Soft tissue defects are a challenging problem in plastic and reconstructive surgery and there is still a need for adequate solution. A high number of patients are suffering the disfiguring loss of soft tissue mainly due to traumatic, congenital or post-surgical defects (eg. removal of breast cancer). Imitation of the human adipose tissue by developing new tissue engineering technologies could help to solve the problem. Many US companies are now ahead of the competition in the applied research of this field. The main objective of the project is to bring together new technologies of polymeric scaffold engineering and recent cell culturing techniques to develop a living and viable artificial adipose tissue to be surgically implanted for a more efficient treatment of large soft tissue defects. The bio-hybrid to be developed will be composed of autologous adipocyte-precursor cells grown on an optimized biodegradable scaffold.

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Growth Programme - RTD

Title :

NANOMETRIC SILICA AS A NEW SURFACE TREATMENT FOR THE CORROSION PROTECTION OF STEELS AND GALVANISED STEELS.

Generic activity MAT

Duration : 48 months

Proposal Reference GRD1-1999-11230

Project Acronym SILACOR

Contract Reference G5RD-CT-1999-00087

EC Project officer T.AGELADARAKIS

Abstract :

The central theme of the research is the development of new coating techniques for the protection of steel against corrosion. The coatings are based on specifically designed silica materials to be applied on steel or on zinc pretreated steels. A major benefit will be the use of these coatings as substitutes for environmentally unfriendly chromate passivation films. The research will divide between practical work, including fabrication of the silica materials and deposition of protecting layers, and fundamental investigations in view of a basic comprehension of the silica induced protection mechanism. The programme includes the participation of industries interested in the application and the benefits of the research.

Coordinator

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I	Consiglio Nazionale delle Ricerche (CNR)
D	CHEMETALL
B	Katholieke Universiteit Leuven
F	Centre National de la Recherche Scientifique
F	SOCIETE NOUVELLE DES COULEURS ZINCIQUES
B	ONDERZOEKENSCENTRUM VOOR AANWENDING VAN STAAL
B	PRAYON - RUPEL S.A
F	Université DE FRANCHE-COMTE

Growth Programme - RTD

Title :

FUNCTIONAL LIFE PREDICTION OF ELASTOMERIC COMPONENTS

Generic activity MAT

Duration : 36 months

Proposal Reference GRD1-1999-11258

Project Acronym FULPEC

Contract Reference G5RD-CT-1999-00165

EC Project officer HH. PEDERSEN

Abstract :

To maintain the competitiveness of supplier and end-user industries of components made from rubber, greater knowledge of processing, design and service environment factors on functional life is needed. To solve this problem the objectives are:

- (a) identify and quantify key factors in processing, design and service environment that control the functional life of rubber components, and
- (b) develop computer simulation models that can be used to rapidly predict the performance of improved processes or designs.

The objectives will be achieved by:

- (1) investigation of mixing and moulding factors on functional life,
- (2) modelling components behaviour in service,
- (3) development of materials tests and performances models,
- (4) validation of computer simulation models with component test and end-user trials.

The expected results are:

- (i) validated predictive models that simulate component performance in automotive break systems,
- (ii) know-how and predictive models to optimise processing and design, assess alternative materials, define accelerated test conditions, reduce prototype testing, reduce development time, and improve reliability.

Coordinator

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VITAMOL LIMITED

Growth Programme - RTD

Title :

Metal Oxide Multilayers obtained by cost-effective new CVD technologies for magnetoelectronic microsystems and nanotechnologies

Generic activity MAT

Duration : 36 months

Proposal Reference GTC1-1999-10022

Project Acronym MULTIMETOX

Contract Reference G5RT-CT-1999-05001

EC Project officer B. TUBBING

Abstract :

The co-ordinated activities will concentrate on the preparation and investigation of high quality epitaxial films and multilayers of metal oxide(MO) materials. These heterostructures are based on high-Tc superconductors (HTSC) and ferromagnetic materials exhibiting high magnetoresistance (CMR), which are of greatest importance for novel magnetoelectronic applications. The films will be obtained by means of innovative chemical vapor deposition (CVD) techniques. Special emphasis will be put in the characterisation of the microstructure of interfaces and the study of the physical properties of the epitaxial heterostructures. The final scientific goal of the project will be to obtain new magnetoelectronic devices, such as spin polarised quasi-particle injection devices, and spin valves devices from the thin heterostructures. The industrial partners within the network will participate in the assessment and the transfer of these technologies to industry. Special interest will be given to the training and education of young scientists, and to knowledge diffusion through the organisation of three main Seminars and four Workshops on different topics related with the network activities.

Coordinator

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Partnership

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E	Sociedad Espanola de Carburos Metalicos, S.A.
LT	Vilnius University
P	Fundação da Faculdade de Ciencias da Universidade de Lisboa
F	Institut National Polytechnique de Grenoble
PL	Institute of Physics Polish Academy of Sciences
IRL	THE PROVOST FELLOWS AND SCHOLARS OF THE COLLEGE OF THE HOLY AND
P	Instituto Tecnológico e Nuclear
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