Executive Summary:
Unlocking the Croatian Textile Research Potentials
Grant agreement 229801

T-Pot aims to reinforce research potentials of the Faculty of Textile Technology of the University of Zagreb (TTF) in order to strengthen the university sector to become one of the components of the national innovation system in Croatia. The goals are to develop the capacity for breakthrough research, leading to innovative textile and textile related products, contributing in this way to the local industry, both nationally and in the region.

The overall objective of T-Pot is to unlock and upgrade the research potential of the Faculty of Textile Technology (TTF), particularly its Textile Science Research Centre, enabling enhanced participation of Croatian textile organisations in research activities at the European level, in order to support the harmonisation and integration process of Croatian textile entities into the European Research Area.

The reinforcement of TTF's research potentials is done through the reinforcement of human and material potential, as well as the research infrastructure. The recently established Textile Science Research Centre is upgraded to become one of the components of the national innovation. Top scientists are attracted to the country for exchange of know-how and guidance of Croatian textile manufacturers. That is why T-Pot addresses all major issues of improvement of research capacities, addressed in FP7 Capacities Work Programme: Research Potential, as topics for REGPOT-2008-1:

1. Reinforcement of S&T potential
2. Developing strategic partnerships with well established research groups
3. Supporting and mobilising the human & material resources
Project Context and Objectives:

All objectives envisaged to be carried out during the project lifetime have been successfully completed and all tasks have been concluded. WP1: Management T.1.1 Organisation of periodical meetings - meetings of the Management Board (kick-off, progress meetings every 6 months) - meetings of the Management Team (progress meetings once per month) T.1.2 Contract administration T.1.3 Financial administration T.1.4 Project reporting (Midterm and Final reports) The management team performed all envisaged tasks timely and in accordance with the best practices. Effective project management procedures were detailed in Project Handbook (D.1.1).

Operational board meet on a regular monthly basis to discuss current project issues and manage possible changes while Management board held regular 6 months based meetings. The quality assurance was controlled by constant monitoring of execution, reaching of milestones as well as producing of deliverables on time. WP2: Developing strategic partnerships for know-how transfer T.2.1 Initiating partnerships: with 3 Institutes (STFI, LEITAT and INFMP) and 1 SME (GZE). Additional partnership with EMPA and University of Ljubljana.

T.2.2 PhD Employment and secondments: Employment of 3 young scientists. Total secondments duration: 16 months. - Marina Turalija, 01.09.2009.-01.05.2010.; 01.07.2010.-01.08.2010.; 10.03.2011.-20.05.2011. EMPA, St. Gallen, Switzerland (13 months) - Eva Magovac, 19.11.2010.-19.12.2010 University of Ljubljana, Slovenia (1 month) - Zorana Kovacevic, 18.10.2010.-18.12.2010. Institute of Natural Fibers and Medicinal Plants (INFMP), Poznan, Poland (2 months) T.2.3 Mentors know-how transfer (Visit of mentor to EMPA, INFMP and University of Ljubljana) - Sandra Bischof Vukusic: -16.11.-20.11.2009 EMPA, Department for Advanced Fibers, St. Gallen, Switzerland - 15 till 17 June 2010, INFMP - November 2010, University of Ljubljana, Ljubljana, Slovenia T.2.4 Research secondments, up to 6 months within EU borders. Total secondments duration: 4 months: - Sanja Ercegovic Razic, from 16.06.2009.- 20.07.2009 LEITAT, Terrassa, Spain (1 month) - Antoneta Tomlijenovic, from 28.02.2011.-18.03.2011 LEITAT, Terrassa, Spain (1 month) - Vedran Durasevic, from 01.01.2011.-03.04.2011 University of Leeds, Colour Science Department, Leeds, UK (2 months) T.2.5 Research secondments, up to 2 weeks: Croatian scientists: - Sandra Bischof Vukusic, 7.03.-27.03.2009 The University of Georgia, Textile Sciences, Dawson Hall, Athens, GA, USA (2 weeks) - Tihana Miksa Perkovic, 31.01.2010 – 06.02.2010 GZE, Italy (1 week) - Martina Ira Glogar, 28.08.2011-03.09.2011 GZE, Italy, (1 week) EU scientists: - Dr. Thomas Pfueller, 15.05.2011.-21.05.2011 STFI, Chemnitz, Germany (1 week) - Edyta Bogacz, 06.06.2011.-17.06.2011 INFMP Poznan, Poland (2 weeks) - Moises Moron Soler, 18.02.2011.-26.02.2011 LEITAT, Terrassa, Spain (1 week) T.2.6 Hosting scientists - Prof. Charles Q. Yang, 27.10.2011-3.11.2011 University of Georgia, GA, USA - Dr. Sabyasachi Gaan, 17-19.10.2011 EMPA, Switzerland - Prof. David Hui, 5.5.2012-12.5.2012 University of New Orleans, USA. WP3: Recruitment of experienced researchers (for know-how transfer and setting up of new research group T.3.3 Employment of Dr. Andrea Katovic, University of Calabria, Italy, in two shifts: - First shift 1.10.2009-1.3.2010 (5 months) - Second shift 1.10.2010.-1.5.2011 (7 months).

WP4: Acquisition and upgrading of research equipment and setting up new laboratories T.4.1-T.4.4 Acquisition of equipment (TGA, DSC, FTIR, SEM) T.4.5 Presentation of new laboratories at the following occasions: - Opening ceremony: 25.02.2010. - Workshop held by Prof. Charles Q. Yang on 2nd November 2011. - 19th Annal Conference of Croatian Microscopy Society, held on 2nd December 2011.

Project Results:
Main S&T results WP2 – Strategic partnerships and know-how transfer The main purpose of the WP2 is to develop strategic or twinning partnerships with related textile institutions. There are 3 objectives of WP2: - formation of strategic partnerships focused on capacity building through know-how transfer - sharing of research resources - joint initiatives for developing services in support of business and innovation T 2.1. Initiating partnerships The aim of this task was to initiate new strategic partnerships with at least 3 but possibly more partnering institutions, in order to speed up integration of TTF and TRSC into ERA and broaden the knowledge base of TTF and entire Croatian scientific community in the second instance. STFI from Germany, Institute of Natural Fibers from Poland and LEITAT from Spain have already accepted TTF’s request for partnership during the project preparation phase, so the formal agreement was signed at the time of the kick-off meeting in Zagreb. Additionally, as planned in Annex 1, face-to-face visits to new partner institutions were organised, in order to establish further partnerships. The first visit was to GZE- Grado Zero Espace, Italy. In agreement with STFI, INMP and LEITAT, Grado Zero Espace, a research performing SME from Montelupo (Italy) is selected to be the new strategic partner, for its experience in EU programmes and solid research base. EMPA will be a hosting institution without the status of the partnering institution and participation on the project management board. Face-to-face visit to GZE Group of three Croatian T-Pot management Board members (Project coordinator Sandra Bischof Vukusic, Equipment Manager Tanja Pusic and Training Manager Edita Vujasinovic), two German MB representatives (Petra Franitza and Romy Naumann) and Polish representative in MB (Malgorzata Zimniewska) have visited partnering institution Grado Zero Espace at their new premises at Montelupo, Italy on 28-29.05.2010. T-Pot group visited factory Ponte Torto S.p.A. in Prato. After the visit, a new partner Grado Zero Espace have been successfully introduced and cooperation agreement have been signed. Initiating partnership with EMPA EMPA was founded in 1880 in the cellars of Zurich polytechnic University, the forerunner of ETH Zurich. Over more than 100 years of development, today EMPA is an interdisciplinary research and services institution for material sciences and technology development. Their research activities cover the following domain: Advanced Materials and Surfaces, Civil and Mechanical Engineering, Materials and Systems for the Protection & Wellbeing of the Body – Information, Reliability & Simulation Technology, Mobility, Energy and Environment. The face-to face visit to EMPA, Swiss Federal laboratories for materials testing and research has been carried out on 17-19 November 2009. Ph.D Sandra Bischof Vukusic, Professor of University of Zagreb Faculty of Textile Technology visited EMPAs premises at St. Gallen as part of activities of T.2.1. Initiating a partnership and T.2.3. Mentors Know how transfer. The first task of the visit was to establish the research collaboration of TTF and EMPA. In the presence of members of Department for Advanced Fibers, Prof. Bischof Vukusic held three presentations: 1) Presentation of FP7-REGPOT-2008-1: T-Pot project 2) Presentation of TSRC Portal 3) Presentation of research topics within the project: Alternative Environmentally Friendly Processes and Methods of Cellulose Modification. Initiation of partnership with the Institute for Adriatic Crops and Karst Reclamation Former cooperation with association Porart and Town museum Sibenik resulted with the new partnership and cooperation on the topic of preservation of cultural heritage and revitalisation of traditional crafts. Face to face visit of TTF’s group to Split was performed during 7-11.9.2011.
Result of this visit is project submitted to University of Zagreb Development Fund, which was accepted and started from 1st January 2012. T 2.2. PhD student secondments First research secondment at EMPA, Switzerland was carried by Marina Turalija. Dissertation topic, mentored by Prof. Bischof Vukusic (TTF) and Dr. Sabyasachi Gaan (EMPA), is entitled: Antimicrobial functionalization of polylactide polymers through bulk and plasma modification. It is agreed between two organisations that the first part of experimental work would be performed at EMPA, St. Gallen under the supervision of Prof. Ghan, after which the research is going to continue at TTF, Zagreb. B.sc. Turalija spent altogether 13 months at EMPA, and last part of her stay was supported with the funds of Unity through knowledge, Gaining Experience Grant. More about this project is available at: http://www.ts-rc.eu/index.php?option=com_content&view=article&id=239&Itemid=83&lang=en Second research secondment at University of Ljubljana, Slovenia was carried by Eva Magovac. On 19th November 2010 she started her research secondment at the premises of University of Ljubljana, Faculty of Natural Science and Engineering, Department of Textile. During the one month secondment in Ljubljana Eva studied the effect of microencapsulated flame retardants on the flammability and thermal stability of fabrics under supervision of Prof. Petra Forte Tavcar, PhD. The microcapsules have been developed by AERO, Chemical, Graphic and Paper Manufacturers, d.d. Celje, Slovenia. The company deals with a wide range of paper and paper based materials; from repositionable products, self-adhesive materials for label industry to self-adhesive tapes, colours and glues, as well as microencapsulated products and is one of the oldest in this part of Europe for such kind of products. (http://www.aero.si/ps/index_engl.htm) Third research secondment at Institute of Natural Fibers and Medicinal Plants, Poland was carried by Zorana Kovacevic. During the two months secondment at INFMP (18th October – 15th December 2010), Zorana Kovacevic has studied the different methods of Spanish Broom plant maceration (water retting, osmotic degumming and enzymatic treatment) as well as physical properties of obtained fibres under the supervision of Dr. Malgorzata Zimniewska, Head of Department of Textile Technology and The Laboratory of Physiological Influence of Textiles on Human Body. T.2.3. Mentors know how transfer As part of the activities of T 2.3. prof. Sandra Bischof Vukusic visited EMPA and successfully completed first transfer. Prof. Bischof Vukusic discussed the research topic of the Ph.D thesis of Marina Turalija, who was on the research secondment at EMPA. Her supervisor of research work was Dr. Sabyasachi Gaan. PhD is entitled: Antimicrobial functionalization of polylactide polymers through bulk and plasma modification. Public defence of the Disertation topic was held on
17th February 2012, at the presence of Prof. Bischof Vukusic and Dr. Gaan. Second know-how transfer was to INFMP (Dr. Malgorzata Zimniewska) where Zorana Kovacevic was on her research secondment during the winter 2010. Third know-how transfer was to University of Ljubljana (Prof. Petra Forte Tavcer) where Eva Magovac was on her research secondment in duration of one month. T.2.4. Up to 6 months secondments Two research secondments were executed, to partner institution the LEITAT in Spain. The secondees were Ms. Sanja Ercegovic Razic, from 16.06.2009 - 20.07.2009 and Dr. Antoneta Tomljenovic, from 28.02.2011-18.03.2011. T.2.5. 2 week secondments: The execution of majority of secondments is postponed to the second project period due to delays that occured in WP4, equipment acquisition. Only one short research secondment was executed within the first period. Prof. Sandra Bischof Vukusic visited Textile Sciences Department of The University of Georgia, GA, USA in the period 1.3.2009-20.03.2009. Two designers from TTF: Tihana Mikša Perkovic and Martinia Ira Glogar visited Grado Zero Espace, both in duration of 1 week. Third secondment was executed by Vedran Durasevic, from 01.01.2011-03.04.2011 who visited colour Science Department of University of Leeds, UK. T.2.6. Hosting scientists: The following scientists have been chosen as hosting scientists, due to the previous collaboration or due to the broadening of the TTFs research to new directions. 1. Prof. Charles Q. Yang, 27.10.2011.-3.11.2011. The University of Georgia, GA, USA 2. Dr. Sabyasachi Gaan, 17-19.10.2011. EMPA, St. Gallen, Switzerland 3. Prof. David Hui, 5.5.2012.-12.05.2012. University of New Orleans, LA, USA. T.2.7. Evaluation of results: The main results of WP2 are newly established strategic partnerships and new opportunities for cooperation of TTFs researchers to do the part of their research in international environment.

Initiation of partnership with already recognized R&D partners has improved knowledge base of TTF and TSRC through knowledge transfer and adoption of new research methods and technologies, and opened access to international knowledge base and skills to local economy. TTF and TSRC can now better respond to the needs of Croatian and regional textile sector offering broader spectrum of services, alone or jointly with strategic partners. T.2.8. Sustainability of partnerships: A successful partnership included the following sustainability values to guide actions: • Forming an internal sustainability team • Conducting a facility operations assessment • Defining topics/goals of joint interest: Topics: Technical textiles, Composites, Sustainable & green products, Functional finishing Goals: Joint scientific publication, accreditation of testing methods, partnership in EU projects • Evaluating project options: EU or national funded R&D projects • Setting objectives and developing plans • Implementing plans and assessing programs • Measuring successes. By following these guidelines, new partners created motivating environment for long term partnership cooperation. The main contribution to the sustainability is given through creation of project pipeline and definition of long term joint research goals. One of the greatest benefits of individual partners is formation of T-pot Network and sharing lessons learned with other members. WP3 – Recruitment of experienced researchers The WP3 has 5 objectives: - raising the international competitiveness of TTF - forming a strong regional centre - reinforcing human capacities by recruiting experienced researchers - knowledge of unique technologies transferred to TTF - setting up new research directions leading to competitive advantage. T.3.1 Prerequisites for integration - setting up measures and procedures to facilitate recruitment of experienced researchers - formation/upgrade of laboratory - setting up a research group for joint work. Prior to entering the European Union Croatia has signed The European Charter for researchers and The Code of Conduct for the Recruitment of Researchers. University of Zagreb has signed this document on 11th March 2010. Upon formation of SEM laboratory, upgrading of Textile Science Research Laboratory, recruitment of experienced researcher and 3 PhD students, the research group was set. The experience of Prof Katovic is of great importance for her new research group at the TTF. T.3.2 Recruitment of an expert - announcing the need for recruitment of an expert worldwide - choice of candidates, under The Code of Conduct for the Recruitment of Researchers - organization of temporary employment - dissemination of obtained results in papers and conferences. As a part of T 3.2. activities, TTF recruited prof. Andrea Katović, experienced researcher from Italy. Prof. Katovic graduated in Chemistry in 1985 and received a Master of Science degree in Physical Chemistry and Radiochemistry in 1989 at the Faculty of Sciences and Mathematics, University of Zagreb. Her PhD thesis was accepted by the Scientific Council of the Ruder Boskovic Institute in 1990 and issued in 1991 by University of Zagreb. From 1985 till 1992 she was employed at the Rudjer Boskovic Institute at the Department of Nuclear Energy, first at the Technology and Protection Laboratory for Colloidal Chemistry and later at the Laboratory for Synthesis of New Materials. Since 1993 she has been working at the University of Calabria (UNICAL). The University of Calabria (http://www.unical.it) is a medium-sized university with about 36.000 students situated in Southern Italy, is a public institution established in 1972. Her actual research activities comprise preparation and characterization of micro and mesoporous materials that are interesting for catalysis and adsorption as well as liquid phase heterogeneous catalysis with a special emphasis on ecosustainability of materials and processes. Recruiting prof. Katovic brought missing and much needed expertise to complement existing one at TTF, and enabled formation of new research group dealing with a topic not previously dealt with at TTF. By formation of new research group and purchasing of the equipment for thermal analysis and SEM within the framework of T-pot project, a process of creation of new nanotechnology department at TTF is successfully completed. Significant results of WP3 Activities of WP3 produced two significant results - an experienced researcher is employed and new research group mentored by a respective researcher is formed and successfully integrated into the TTF research environment. Additionally, procedures for short term employment and integration of experienced researchers have been improved, simplified and adopted as a new standard procedure.

This initiative was a joint effort of the University of Zagreb, four REGPOT 2008 project coordinators, the Ministry of Science, Education and Sport and Agency for Mobility and EU programmes. Having in mind a Croatian scientific community recently fully opened to ERA,
adopting standard practice for employment and integration of experienced researchers have had significant impact to all future mobility actions. WP4 – Acquisition and upgrade of research equipment Objectives of the WP4 WP4 has five objectives: - upgrading of research equipment for in-depth scientific investigations - purchase and installation of equipment - education of personnel in use of equipment - creating flexible scientific research laboratories with modern equipment where groups of researches can work on specific projects - create conditions for cooperation with industry and joint projects All tasks of WP4 envisaged to be carried out are successfully completed. All the equipment purchased under the WP4 Acquisition & Upgrading of Research Equipment is located in two laboratories at the Department of Textile Chemistry & Ecology in Zagreb, Croatia, according to the plans presented in Grant Agreement.

T.4.1. - T.4.3. Acquisition of the first set of the equipment (FTIR, DSC, TGA) The purchase of the first set of the equipment was performed under the Public procurement no. EVV-14/2009. The purchase contract no. 02-1851/2009 was signed on 15th October 2009 and the equipment was installed in January 2010. T.4.4. Acquisition of second set of the equipment (SEM, EDS, Sputter) The purchase of the second set of equipment was performed under the Public procurement no. EVV-5/2009. According to the Contract, the ordered model FE SEM Mira II LMU was installed at the premises of the Department of Textile Chemistry & Ecology, Faculty of Textile Technology, University of Zagreb in December 2009. All the equipment is located in two laboratories at the Department of Textile Chemistry & Ecology: • Textile Science Research Laboratory: DSC, FTIR with TG-IR interface and TGA, purchased from Perkin Elmer. • SEM Laboratory: dedicated exclusively to SEM analyses. It was completely rearranged to obtain its best functionality. Following equipment was purchased: a) Microscope: FE-SEM MIRA/LMU, Tescan; b) EDS detector for the chemical analyses: AXS Microanalysis Quantax, Bruker; c) Sputtering device: SC7620-CF Mini, Quorum Technologies. Training for use of the equipment: Two trainings were organized for each set of equipment: a basic level training immediately after the installation of the equipment, and an advanced level training 2-3 weeks after. T.4.5 Presentation of new laboratories 1. The opening ceremony: 25.02.2010. The opening ceremony was held in the presence of Radovan Fuchs, Minister of Science, Education and Sports, Prof. Aleksa Bjelis, Rector of the University of Zagreb, Hrvoje Mestric, Director of the Directorate for Science at the Ministry of Science, Education and Sports and Ante Rezo, Senior advisor for Textil and Leather industry of Economy, Labour and Entrepreneurship. Coordinator of FP7-REGPOT-2008-1-229801: Unlocking the Textile Research Potentials (T-Pot) project Prof. Sandra Bischof Vukusic has expressed the welcome and shortly presented the project activities. Dean of the University of Zagreb Faculty of Textile Technology, Prof. Darko Ujevic, held the first speech and presented scientific and educational activities of Faculty of Textile Technology. The laboratories were opened officially by the Minister of Science, Education and Sports, Radovan Fuchs with the words of pride and satisfaction for the exceptional success of the Faculty of Textile Technology. Presentation was documented by national television and newspapers. A TV presentation in duration of 2 minutes is shown on national TV as a part of daily evening news in prime evening time. 2. Presentation of laboratories during the Textile Forum, held on 2nd November 2011. The group attending the lecture of Prof. Yang consisted of aprox.75 scientist from different R&D institutions: representatives of 5 Faculties and Ruder Boskovic Institute. After the lecture, new laboratories were presented and Prof. Yang was available for the individual consultations with the interested PhD candidates or young researchers. New contacts with other Croatian spectroscopy and termonalysis research groups have been made. 3. Presentation of laboratories, during the Annual Conference of Croatian Microscopy Society (CMS), held on 2nd December 2011. Due to the purchase of SEM, Faculty of Textile Technology was hosting the Annual 2011 Conference of CMS. More that 70 members were present and after the officical programme, new laboratories were presented. WP5 – Organisation of workshops and conferences Objectives of WP5 – Organization of workshops and conferences are the following: - know-how transfer and dissemination of scientific information - improving and developing skills at all levels of human resources - training activity in order to provide highly qualified and skilled workforce and to create a core group of well-trained researchers with the skills to spread the achieved success T 5.1. Training in partners' premises In-house 3 day training events at partner (host) institutions: - LEITAT, Spain (topics: Functional finishing) - Institute for Natural Fibres, Poland (topic: Multifunctional fibres, Fibers reinforced composites) - STFI, Germany, (topic: Technical textiles, Quality) - GZE, Italy (topic: Functional Design). 5.1.1. Workshop at Technological center LEITAT The workshop was held from June 16-19, 2009 at Terrassa, Spain. LEITAT is a Technological Center dedicated to providing services to other companies of the industrial sector, adding technological value not only to the products, but to their processing as well. While focusing on Research, Development, and Innovation (R+D+I), these services offered by LEITAT, are clearly oriented and aimed to comply with a constantly changing market. The Technological Center LEITAT was founded in 1906. Since its origins, LEITAT has prioritized its service vocation to companies and their needs, fostering, honesty, professionalism, respect for others and the environment. The promise to pursue the best technological solutions for other companies, has allowed LEITAT to collaborate closely with Public Institutions, State Bodies, Universities, and other technological centers, in search of the most efficient answers to the client's demands. A multidisciplinary staff, composed by PhD, expert researchers and engineers, comprises the solid foundation of their development - not only on project development, but on the design and guidance as well, always directed towards the needs of the final client. LEITAT is currently working and collaborating with a wide variety of sectors that range from aeronautics, automotive industry, construction, energy, safety and protection systems, plastic and metal materials, maritime, healthcare, environment, furniture, to textile. Technological ceter Leitat hosted a workshop for 12 participants from Croatia: ten from Faculty of Textile Technology and two Croatian textile industry representatives from Cateks and Dorateks. The three-day workshop (June 17th - June 19th 2009), consisted of two lectures per day, including laboratory practices. The workshop topics were the following: 1.
Innovative textile finishing, presented by Roshan Paul, Ph.D. 2. Plasma technology applied to textiles, presented by Lorenzo Bautista 3. Smart materials and technical textiles, presented by Laurent Aubouy, Ph.D. 4. Eco-design, presented by Marta Escamilla Monell 5. Properties, applications and uses of technical textiles, presented by Javier Jimenez Romero 6. Biotechnology in textile sector and textile care, presented by Marta Alaman & Anna Surribas Casalprim, Ph.D. 5.1.2. Workshop at STFI STFI was founded on the 17 February 1992 by 24 enterprises and institutions of the textile industry. Since December 2006 STFI has been associated to the Chemnitz University of Technology. STFI has 120 employees (researchers, laboratory assistants and technicians). Each year, more than 100 R&D projects on regional, national and transnational level are carried out by STFI in the fields of Technical Textiles, Nonwovens/Films, Warp-knitting/Weaving, Textile Finishing/Ecology, Textile Recycling, Vegetable Fibres, Technical Nets and Ropes and Textile Materials Research. Saxon Textile Research Institute (STFI) workshop was organised in Chemnitz, Germany, from 29th November to 4th December 2009. The workshop was held for 8 researchers from the Faculty of Textile Technology - Assoc. Prof. Sandra Bischof-Vukusic, Ph. D., Prof. Drago Katovic, Ph. D., Assoc. Prof. Edita Vujasinovic, Ph. D., Eva Magovac, B. Sc., Junior Researcher Dragana Kopitar, B. Sc., Assistant Zaklina Domijancic, B. Sc., Junior Researcher Maja Somogyi, B. Sc. and Junior Researcher Snejzana Brmada, B. Sc., and two participants from industry Mr. Alan Durek, B. Sc. (Regeneracija) and Ms. Marijana Zeljko, B. Sc. (Kelteks). The workshop consists of the following activities: a) One-day visit to SOEX textile recycling company - A one-day workshop on technical textiles at STFI premises (including visit to STFI laboratories) - Attendance at 9th STFI-COLLOQUIUM - Recycling for textiles (re4ex), a two-day colloquium organised by STFI on textile recycling a) Visit to SOEX textile recycling company On 30th November 2009 T-Pot group have visited SOEX company for recycling of old clothes (textile waste) and converting it into material for automotive or construction industry. Old clothes are converted into valuable recycled product. The company is located in Wolfen (Sachsen-Anhalt). SOEX employs approx. 550 workers, among them qualified IT experts and experts in departments of sorting, warehouse and logistics. The supervisor processes orders (processes orders of the buyers of certain articles, with every buyer identified by his own number and a list of ordered articles), monitors movement of articles (the transport line is 5 km long) and looks for possible technical problems. There are three production areas in the company headquarters: RE-WEAR, RE-USE and RE-CYCLE. A detailed description of each of the processes and activities in the plant is presented in the deliverable D 5.1. SOEX visit report. b) Workshop on Technical Textile Recycling at STFI On Tuesday 1st December the T-Pot Workshop started, organized by the STFI called „Technical Textiles/Textile Recycling“ in the frame of EU project T-Pot. The main topics of the workshop were the following: Technical Textiles - Development trends and statistics - Industrial applications of technical textiles - Certification of personal protective equipment - Certification of geosynthetics Textile Recycling - General introduction - Recycling processes and machinery - Testing of reclaimed fibres - Practical recycling tests. The workshop was composed of 12 lectures in three blocks. A detailed report on topics and outcomes of the workshop are presented in the deliverable 5.3. Report on STFI workshop. c) 9th STFI Colloquium – Recycling for textiles On 2nd and 3rd of December 2009, the 9th STFI-COLLOQUIUM – Recycling for textiles (re4ex) was held, organized by Sächisches Textilforschungsinstitut e.V Germany. The colloquium venue was Günnewig Hotel Chemnitzer Hof in Chemnitz, Germany. The growth of population results in increasing consumption, disposing of and recycling textile wastes, which are increasingly being monitored and new textile waste disposal acts are being enacted. Forty years ago the institutes already started to investigate textile wastes while nowadays approximately 53% of textile wastes are returned to renewed use. 5.1.3. Workshop at INFMP The workshop organized by the Institute of Natural Fibers and Medicinal Plants was held in Poznan, Poland from 15th to 17th of June 2010. This Institute is the only interdisciplinary research unit with international significance in Poland which takes care of complex researches concerning obtaining and processing natural lignocellulosic fibre raw materials such as: flax, hemp, and protein ones such as: silk, wool and many other fibres. The workshop was attended by 8 representatives of the Faculty of Textile Technology University of Zagreb (Prof. Sandra Bischof-Vukusic, Prof. Drago Katovic, Prof. Zeljko Penava, Sandra Flincec-Grgac, Tihana Dekanic, Marina Turalija, Zorana Kovacevic, Eva Magovac) and 2 representatives from the Croatian textile industry (Ms. Nataza Kozina from Tekstil Lio d.o.o. Ms. Sandra Loncar from Beram d.o.o.). The following topics were presented at this three-day workshop: - Cellubast-Centre of excellence on natural lignocellulosic fibrous raw materials - Friendly new generation textile products - New methods for utilization of textile wastes. The topic of the first day of the workshop was: Cellubast-Centre of excellence on natural lignocellulosic fibrous raw materials, and the subjects of the lectures which were held that day were following: 1. Biological progress in breeding fibre flax and growing technology in studies carried out at the Institute of Natural Fibres and Medicinal Plants 2. Biology and behaviour of silkworms 3. Analysis of natural fibers with SEM application 4. Review of retting methods – Osmotic degumming 5. Natural fibers reinforced polymer composites. The topic of the second day of the workshop was “Multifunctional human friendly new generation textile products”, presented by Malgorzata Zimniewska. After the presentations, the attendees visited all the institute departments - the biotechnology department, department for natural polymer composites, gene bank, laboratory of silkworm breeding and mulberry cultivation, department of bast fiber plants processing technology and department of textile raw materials and products metrology. The topic of the third day of the workshop was “New methods for textile wastes utilization”, presented by Jerzy Ma?kowski. After the finalisation of the lectures the group of Croatian representatives visited experimental plant “Lenkon”. The Farm is situated about 25 km away from Poznan on the road to Wroclaw. The basic objective of the farm is conducting scientific and implementation activities in terms of obtaining and manufacturing flax and
hemp straw as well as carrying out experiments associated with different applications and utilization of fibrous raw materials. The farm is equipped with special machines which enable realization of experimental and implementation of projects to be carried out. The most important experimental devices owned by the Farm are a scutching drum unit for determining the content of long fibre, a tow aggregate for experimental manufacturing of short fibres, a testing unit which includes carding machines, drawing frames and spinning frames for manufacturing technical yarns, a unit used for producing non-wovens, an apparatus used for cottonisation of flax and hemp fibres, a prototype line for fibre plants decortication for pulp and paper purposes and for composite materials. The attendees have seen the whole production cycle: from the cultivation of linen and hemp plants, mechanical and chemical treatments during the production and finally spinning, weaving and finishing of yarn. T 5.2. Training at TTF premises: - A 3-day training events at TTF premises: - Training at TTF (topic: Innovation) - Training at TTF (topic: Innovation management). 5.2.1. Workshop on Innovations in T/C and ICT sectors Workshop: The role of innovations, in particular for textile/clothing and ICT sectors was organized jointly by the University of Zagreb, Faculty of Textile Technology & Croatian Chamber of Economy. The workshop was held from 21-23 September 2009, at the premises of the Croatian Chamber of Commerce and attended by 76 participants. The most interesting lecture at the workshop, according to the public reaction and filled-out Questionnaire, was a lecture given by Mrs. Elena Turco from the Italian company GZE. She presented an innovative design of the GZE company, followed with the practical example of a motorcycle jacket. On this textile product with ICT integration consisting of electroluminescent device integrated into a protective garment. At this workshop, Croatian lecturers demonstrated a great potential for scientific research, as well as numerous opportunities for the RTDs institutions and small and medium-sized enterprises (SMEs) with the aim of better integration in European research area (ERA). Lecturers from the European Union through their presentation, and particularly through their active involvement in the discussion held after the lectures, gave positive examples of good practice, where the innovation has led to a new product, process or service and thereby ensured competitiveness on the market. 5.2.2. Workshop Innovation Management Workshop: Innovation management, was organized jointly with Croatian Chamber of Trades and Crafts (HOK) in Zagreb, 9th – 11th May 2011. Aim of the workshop is to intensify the cooperation between academy & industry. The topic of Innovation management has been chosen in order to present the importance innovation potential mapping and the further exploitation of knowledge gained within RTDs, SMEs or their joint efforts. T 5.3. International Textile, Clothing & Design Conference (ITC & DC) 2010 - Scientific dissemination of partnership results - Progress meeting of the Management board. 5th ITC&DC 2010 was organised by the Faculty of Textile Technology, University of Zagreb. It was held at Dubrovnik from 3rd to 6th October 2010 in the International Centre of Croatian Universities (ICCU). The Conference was attended by 247 attendees, from 36 countries. There were scientists and experts from different research community (natural science, material science, textile technology, ecology, management etc.), textile and chemical industry, journalists (AATCC Review, Tekstil, Journal of Natural Fibres), students etc. At the Conference 168 papers were presented and 9 of them (listed in Template A1) were from T-Pot’s scientists. T 5.4. Textile Science and Economy Symposium & Round table Textile Science & Economy is a scientific-professional symposium organized jointly with: The Scientific Council for the Technological Development of Croatian Academy of Sciences and Arts and Croatian Academy of Engineering, and under the auspices of Ministry of Science, Education and Sports, Ministry of Economy, Labour and Entrepreneurship and Croatian Chamber of Economy. The 2010 Symposium was co-funded by the European Commission through the T-Pot project. Since 2010, TS&E Symposium gained the status of an international one and apart from the partners of the T-Pot project following questions from member or associated states of Germany, Spain, Poland, Italy, Hungary, Austria, USA, Slovenia, Serbia, Albania and Kosovo were present. The Symposium's objectives were: • Presentation of scientific research potential in synergy with the economy. • Contribution to the revitalization of economic subjects through the discussion at the Roundtable - together with the eminent foreign colleagues. The general aim of the TS&E Symposium is to intensify the cooperation between TTF and the industry. The following topics are specified in order to boost the growth of the Croatian textile industry: 1. Plenary lecture: Grado Zero Espace's Design Method Applied on New Product Development and Consulting, presented by Elena Turco, GZE 2. Invited lecture: Strategy of the Textile and Clothing Industry - Status and Prospects, presented by Milan Luši?, Varteks 3. Invited lecture: Types and Ways of Technology Transfer, presented by Neda Matijevi?, Ministry of Economy, Labour and Entrepreneurship The novelty as to former TS&C conferences was the Round Table on which the participants actively pursued the topics of mutual interest for both the businessmen and scientists regarding the textile, clothes and footwear industry. The Round table has been organized after plenary and invited lectures so that the participants of the Symposium could debate on the topics: Position of European and Croatian Textile and Clothing Industry in the Global Surrounding. After the discussion, suggestions have been made and important conclusions were adopted: Suggestions of the Round table: 1) Inclusion of Faculty of Textile Technology in the process of revising, coordinating and implementing strategies of textile and clothing industry. 2) Planning funds for financing the preparation of projects from the budget of Strategies of textile and clothing industry. 3) Ministry of Economy, Labour and Entrepreneurship is kindly requested to clarify the selection criteria of project funding in more details. Conclusions of the Round table: 1) Cooperation between science and economy should be further intensified: o through scientific research and projects o through better usage of TTF's human and material resources. 2) The future of textile industry lies in the innovations, branding and niche markets. The third International scientific-professional symposium Textile Science and Economy ended with a fashion show organized by the talented students of the Faculty of Textile Technology. Through a variety of colours and forms of their creations they highlighted the importance of linkages between the academy and industry. T 5.5. Attendance
at Textile and related conferences: 5.5.1. Attendance at textile conferences: AATCC, AUTEX, WIRE T-Pot coordinator prof. Sandra Bischof Vukusic attended AATCC 2009 conference held in Myrtle Beach from 10th till 12th March 2009, jointly with the activity T.2.5 Researchers secondment (up to 2 weeks). Within T.2.5 Prof. Sandra Bischof Vukusic visited Prof. C.Q. Yang from the University of Georgia (UGA) and working with him for 2 weeks on the topic: Flame retardancy of cellulose materials treated with organophosphorus agents. At UGA she finished extensive training on novel equipment - Micro Cone Calorimeter (MCC) which is in a purchase plan of Faculty of Textile Technology. Two TTF researchers (Prof. Drago Katovic and Prof. Tanja Pusic) attended AATCC 2010 conference held in Myrtle Beach from 18th till 20th May 2010. Prof. Pusic presented the paper entitled: Microcapsules Quantiﬁcation Using Streaming Potential Method, while Prof. Katovic, as President of Textile Science Research Centre presented activities of TSRC, upon the finalisation of lectures. New contacts have been established with the representatives of the American company Cotton incorporated. Prof. Katovic, in a capacity of the TSRC president attended WIRE2010 event. At the WIRE2010 (Week of Innovative Regions in Europe - http://wire.econgresos.com) held at 15-17th March in Granada, Spain University of Zagreb, Faculty of Textile Technology participated in the Category 3, Connecting Research Centres from all over Europe (REGPOT) with the poster presentation No. 49 entitled: Unlocking the Croatian Textile Research Potentials. The event was organized jointly by the Spanish Ministry of Science and Innovation and the European Commission, under the auspices of the Spanish EU Council Presidency. The conference focus was on „How to move from synergies of policies to synergies of actions for the optimal use of EU instruments, with the objective of making regions full protagonists in building the knowledge-based society”. 5.5.2. Entering the new ﬁelds In July 2010 two of TTF T-Pot project team members participated at 16th International Zeolite Conference (16th IZC) joined with the 7th International Mesostructured Materials Symposium (7th IMMS) which was held from July 4-9, 2010 in Sorrento, Italy. The Conference was organized by the International Zeolite Association (IZA) and the International Mesostructured Material Association (IMMA), together with the Italian Zeolite Association (AIZ), the Interdivisional Group of Catalysis and the Division of Industrial Chemistry of the Italian Chemical Society (SCI). The Conference was preceded by an intensive Summer School (July 2-3rd, 2010) in the Congress Centre Hotel Pietra di Luna, Maiori, Salerno, Italy. The school was attended by the young scientists and students from all over the World (China, Brazil, France, Germany, Czech Republic, Italy, Slovenia, The Netherlands, Croatia etc.) The pre-conference school was attended by T-Pot members Sandra Flincec Grgac and Zorana Kovacevic. - Presentation in the new sections: • Frontiers in electron microscopy. • Measurement and modelling of phenomena in advanced materials Beside this AMN-5 oﬀered two free of charge Pre Congress Workshops: Pre Congress Workshop 1 – Multidisciplinary Collaborative Research Ventures – The Keys to Success and Pre Congress Workshop 2 – EU Materials-related COST Programme, both of them attracted our attention since it seems that they might be of great importance for our research group in our future research work and networking. Having in mind that such trip is time and money consuming our intention was to beneﬁt from it in a way that at the same time we can visit New Zealand’s University where textile, especially textile design is taught, because we want to get some impressions and knowledge in functional textile design (design for speciﬁc purpose e.g. design of protective clothing) while this seems to be one of the weak point within our Croatian T-Pot research team since our design staff are more oriented on creativity then on functionality. In order to be in line with the state of the art in this ﬁeld our decision was to attend one or some of the Conferences where we will be able to see what is new and in focus within advanced materials and nanotechnology. Since 2011 has been chosen as the International Year of Chemistry, IYC2011, there were a lot of announcements for the Conferences intended as a worldwide celebration of the achievements of chemistry and its contributions to the well-being of humankind. After careful screening of all those Conferences (purposes, topics, possibilities, etc) our decision was to attend Fifth International Conference on Advanced Materials and Nanotechnology (AMN-5) that was scheduled from 7th till 11th February 2011. The reasons for this decision were: Among all listed Conferences, although some of them were in Europe, this was the only one Conference that was focused on all and different kind of advanced materials and related nanotechnology. This Conference is held every two year with a lot of scientists from all over the World and it is always located at southern hemisphere (somewhere in New Zealand – Dunedin, Wellington, Christchurch). Since announced Contributors included Nobel Laureate Professor Sir Anthony Leggett (Illinois, USA), Professor Sir Richard Friend, (Cambridge, UK), Professor Jean Fréchet (Berkeley and LBNL, USA), and Professor Neil W Ashcroft (Cornell, USA) it will be great opportunity to see, hear and talk with distinguish scientists that indebted the mankind. According to the listed topics The Fifth International Conference on Advanced Materials and Nanotechnology (AMN-5) might oﬀer a broad interdisciplinary overview of advanced materials and nanotechnology, and provide an exciting forum to discuss new and exciting advances in the field of nanoengineered materials and devices, electron microscopy, functional nanocoatings, hybrid materials, new materials and devices for radiation imaging and detection and advanced materials. All of these are more or less in line with our research so we were able to present some of our research within T-Pot project (two oral presentations) as well as to promote T-Pot project as part of broader European FP7 projects and philosophy. ? The World Congress on Chemical, Biological, Radiological / Nuclear Threat (CBRN) & Chemical and Biological Medical Treatment Symposium (CBMTS) -Industry VII, were held from 10-15.4.2011. in Cavtat, Croatia At the CBMTS VII Symposium a new section was open for the ﬁrst time. This section entitled Protective materials, protective clothing and equipment against CBRN threats was chaired by T-Pot manager Edita Vujasinovic?. Our appearance at this Congress was a great opportunity for us to enter in to the military world with textiles and achievements that we have in the ﬁeld of protective clothing. This assumption proved to be right since we had numerous contacts, some proposition for future work and some
suggestions for new study discipline (regarding materials and design for protective and military clothing) at our Faculty. Textile Bioengineering and Informatics Society (TBIS) 2011 International Symposium on Advanced Textiles, Fashionable Industry, was held from 27th to 29th May, 2011 in Beijing, China. Prof. D. Ujević, T-Pot manager, was invited to the TBIS 2011 Symposium as a keynote speaker and member of the International Scientific Committee of TBIS 2011. During the conference a new contact was established with internationally-recognized expert in the field of Clothing Technology and Anthropometry Prof. Susan Ashdown, Ph. D. from the United States. Professor offered cooperation through the exchange of data related to PEDUS 3D Foot Scanner by Human Solutions and expertise. Such 3D multifunction scanner is recently purchased by TTF and is in the usage for the anthropometric measurements. 20th Annual International Conference on Composites or Nano Engineering ICCE-20, will be held from 22 th -28th July 2012 in Beijing, China. Prof. S. Bischof, T-Pot coordinator, is invited to ICCE Conference as a keynote speaker by Conference Chair, Prof. D. Hui. Prior to the conference Prof. Hui will be guest of the University of Zagreb and held two lectures dealing with the emerging topic of nano-engineered materials with the emphasis on safety of materials usage. T 5.6. Dissemination conference Due to the prolongation of project of 6 months, Final dissemination conference was held on16th February 2012 and not in 2011 as initially planned. Organised by TSRC in cooperation and at the premises of Croatian Chamber of Trades and Crafts, where all partnering organisations presented results of the partnership established during the project and vision of furher cooperation. Exibition of Protective materials/clothing of Croatian SMEs and craftmen was organized, resulted with the huge participation of the representatives from industrial sector at the Dissemination conference. Both clusters:Teksko mreža (http://www.teksko-mreza.com/eng/members/) and Opteko grupa (http://opteko.hr/en/) working in the domain of protective clothing were present, gathering all together 30 SMEs. 3.2.2.1. WP6 – Dissemination Objectives of WP6 - international promotion of Textile Science Research Centre of the Faculty of Textile Technology, University of Zagreb and Croatian T/C SMEs research potentials - disseminating and exploiting of strategic partnerships results and obtained knowledge-publishing and dissemination of the information and training material compiled at project activities - enhancing the rate of proposals submission. T.6.1 Textile Science Research Portal, http://www.ts-rc.eu The Textile Science Research Portal is set up and maintained by the subcontractor company PENG d.o.o. The portal has been in full function since May 2009, serving as a focal point and major disseminating actor of T-Pot project, TSRC – Textile Science &Research Centre and TTF – the Faculty of Textile Technology. Textile Portal also has a function of being a meeting point and discussion forum for all interested in textile technologies and related areas. Gradually, with enhanced visibility and promotion, the portal also becomes a local technology marketplace for textile and similar companies looking for new technologies, needed equipment or partners. T.6.2 T-Pot web-site, http://www.t-pot.eu The T-Pot web site has been set up and running since May 2009, and serves as an information point about the T-Pot project and its activities. All public deliverables, dissemination materials, articles and promo materials are available from the site to general public. The site also features a members area for project partners, to exchange information and simplify project management. The web site is run and moderated by TTF, while subcontractor PENG d.o.o. is responsible for the technical side, web administration and maintenance. T.6.3 STEP web site: http://www.tff.hr/step/ The STEP web site is a Service for Textile European Projects, a special feature within a TTF main web site, dedicated to dissemination of information about EU programmes and projects relevant for the textile sector. The Service nfortuna established to assist the faculty members and the administrative staff of the Faculty of Textile Technology. The objective is popularization and assistance in coordination of the EU projects where the TTF staff are involved or intend to be involved either as partners or coordinators. The ultimate goal of the Service nfortuna to increase competitiveness of the Faculty through exchange of ideas, experience and knowledge, increasing the quality of scientific research, educational work and management in international cooperation within a framework of European projects. The STEP web site has been in full function since April 2009 and is maintained and run by TTF staff, coordinated by a T-Pot project coordinator prof.dr.sc. Sandra Bischof Vukušić?. T.6.4. Postgraduate Seminars Instead of initially planned brochure the papers submitted for the Textile Science Research Centre competition were published in book entitled: Young Scientist in the Protective Textiles Research. Award ceremony of TSRC of the most successful scientific or artistic research work of young scientists in the field of protective textiles and promotion of the book was held on 18th of July 2011 at the premises of the Rectorate of the University of Zagreb. T 6.5. Textile Forums A total of 3 textile forums were envisaged to be held in the project life. Deviation from the initial plan has been made and 3 new topics have been chosen. During the project lifetime a strong cooperation with 3 SMEs has been established: ? Cotton Incorporated, NC, USA, contact person: Ken Greeson ? Du Pont International, Slovenia, contact person: Ljubica ?esnik, Safety & Protection, ? Schoeller Textiles, Switzerland, contact person: Dinka Liplin-Prpi?, Power of Innovation. 6.5.1. Cotton Incorporated Initial contacts have been established at AATCC 2010 conference in Atlanta. Upon the visit of 2 representatives, funded by their own funds, a long term collaboration has been established. Further initiative is submition of R&D proposal for cotton research, coordinated by TSRC, to Cotton Incorporated research department. Proposal title is: • Hand & drape upgrading of cotton and coton blended fabrics for the Women's Wear 6.5.2. Du Pont International Initial contacts have been established through the collaboration with Croatian SME HEMCO, which has Certificate as DuPont Quality Partner, since 2009. During the 10th International fair on protection of persons & property INTERPROTEX, the collaboration with regional representative of DuPont has been established. Further activity was joint presentation of HEMCO and DuPont at the Exhibition held during the T-Pots Dissemination Conference. Figure 36: Collaboration of representatives of TSRC (S. Bischof V. and T. Pusic), Croatian Association of Textile Engineers (A. Vincic), DuPont (Lj. Cesnik) and HEMCO (S. Mihalj) Sustainability of the cooperation is confirmed with the further activities: •
Symposium is already well known locally and regionally, but by being organized through the EU project and with added value topics future partnerships with participating organizations, and enhancing visibility of Croatian textile research potential. The TS&E a number of opportunities for exchanging of ideas and discussing future steps locally, creating at the same time good opportunities for TTF and visibility of TTF and TSRC on the international scientific scene. The Innovation workshop was very well attended and created dissemination and visibility enhancing goals of the T-Pot project. All articles, videos and photo gallery from events can be downloaded from the T-Pot web site. T.6.7. Printing & Publishing T-Pot project produced following flyers: TSRC, TSRC Laboratories and T-Pot project. Further publications were: Book of Proceedings of the TS&E 2010 Symposium, posters and 3 books.

Potential Impact:
The main S&T results/foreground is upgrading of material/human capacities of Textile Science Research Center (TSRC) and knowledge transfer from EU partnering institutions and trained TSRC staff, both to the academic and industrial sector. Materials reinforcement One of T-Pot's highest priorities was the improvement of scientific infrastructure in order to reduce the gap between our present state and EU standards. Investing in equipment served another important purpose — to boost the development of applied research, development of methods, technologies or new products. Furthermore, this acquisition of new equipment certainly contributes to the reinforcement of Croatian internal scientific and technical capacities, allowing us easier future participation in the research activities of the European Research Area. Two laboratories were funded by T-Pot project, SEM Laboratory and Textile Science Research Laboratory. Opening was held on 25/02/2010 in the presence of Minister of Science, Education and Sports, Rector of the University of Zagreb and representative of Ministry of Economy, Labour and Entrepreneurship. The event was widely covered by all national media. National TV broadcasted a special report in the prime time. Two trainings were organized at each set of equipment: a basic level training immediately after the installation of the equipment, and an advanced level training 3 weeks after the installation. Both trainings were attended by 9 TTF researchers. The equipment is in full use and offered to the wider community — academic and industrial users. The number of both academic and industrial users is steadily growing, thus adding to recognisability of TSRC in community and ERA. Already a short period after the installation, the equipment has proven to be of great importance to national universities: University Of Zagreb and University of Rijeka, but to the the other regional R&D institutions, such as Universities of Ljubljana, Maribor and Belgrade.

The following entities of University of Zagreb were using the equipment: • Faculty of Mechanical Engineering, Faculty of Civil Engineering, Faculty of Electrical Engineering and Technology, Faculty of Forestry, Faculty of Graphic Art and Faculty of Science. The following SMEs have been using the microscope for their research purposes: Labud d.d.; Jadran tvornica carapa d.d. Cateks d.d. Galeb d.d. Kelteks, Varteks, HEMCO, Vodopivreda and Aero (Slovenia). Human reinforcement An important task conducted within the T-Pot project with the purpose of raising the competitiveness of TTF and TSRC is the recruitment of experienced researchers. Prof. Andrea Katovic from the University of Calabria, Faculty of Engineering has been recruited to the Department of Textile Chemistry & Ecology, Faculty of Textile Technology, University of Zagreb in duration of 1 year. Her expertise with SEM and TG analyses was extremely useful and shortened the basic training period. In this way full exploitation of purchased equipment and its usage by wider community was established prior to the project end. Three young researchers were working for 2 years for the project, but unfortunately up to now, none of the 4 researchers was offered a permanent position at the University of Zagreb Faculty of Textile Technology. Know-how transfer Five cooperation agreements have been signed with the following strategic partnering institutions: STFI, INFMP, LEITAT, GZE and EMPA. The further objective of organisation of workshops and conferences was fully addressed through the successful finalisation of 4 training events organised at the premises of strategic partners. Further know-how transfer was performed through the two-way research secondments. Representatives of STFI, INFMP and LEITAT have successfully finalized small research projects, which resulted with the joint papers prepared either for the conferences or journals. Under the activity of Textile Forums, cooperation was established with 3 international SMEs (Cotton incorporated, NC, USA; DuPont Europen Technical Center (ETC), Switzerland and Schoeller Textiles, Switzerland). Their professional expertise is transferred primarily to the TTF’s staff, but secondary to Croatian SMEs working in the similar area. The participation at workshops organised by partnering institutions and TTF as well as participation at conferences as AATCCs, WIRE and IZC-IMMS 2010, AMN-5, TBIS and AUTEX proved to be of great value to expand and upgrade the knowledge base of TTF and visibility of TTF and TSRC on the international scientific scene. The Innovation workshop was very well attended and created a number of opportunities for exchanging of ideas and discussing future steps locally, creating at the same time good opportunities for future partnerships with participating organisations, and enhancing visibility of Croatian textile research potential. The TS&E Symposium is already well known locally and regionally, but by being organised through the EU project and with added value topics

Lecture held by Lj. Cesnik entitled: Safety & Protection, planned for June 2012 • study tour to DuPont testing laboratories in Switzerland, planned for September 2012 with the purpose to organize agreement for the long-term scientific cooperation. 6.5.3. Schoeller Textiles, Switzerland Initial contacts have been established through the collaboration with SME Galeb, Omič – final user of Schoellers yams for their production of FR protective knittwear. Sustainability of this cooperation is confirmed with the serie of lectures held by regional representative Dinka Lipšič-Prpic. First nfortun the serie of Longlife learning seminars is entitled Power of Innovation, and planned for May 2012. T.6.6 Presentations T-Pot project has been well covered by national media for all major events – Innovation workshop and TS &E 2010 Symposium, but especially in the event of the official opening of the new laboratories (see WP4), when a national TV broadcast a special 2 minute show on the opening in a prime time evening news. National TV also broadcast a featured 2 minute show on 17 March 2009 about T-Pot and TSRC with TSRC president prof. Drago Katovic and T-Pot coordinator prof. Sandra Bischof Vukusic as guests, as a part of regular show „The Panorama of Zagreb“. Another featured show was held 04 March 2010. on Croatian national TV, in duration of 20 minutes, as a part nfor Scientific Programme. The well established connection with the media continues to support dissemination and visibility enhancing goals of the T-Pot project. All articles, videos and photo gallery from events can be downloaded from the T-Pot web site. T.6.7. Printing & Publishing T-Pot project produced following flyers: TSRC, TSRC Laboratories and T-Pot project. Further publications were: Book of Proceedings of the TS&E 2010 Symposium, posters and 3 books.

Potential Impact:
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such as new feature of round table, it also contributed significantly to the promotion of Croatian textile research potential, as well as the promotion of newly established TSRC. Organisation of conferences and workshops in cooperation with the partnering institutions, presented TTF as qualified organizer of international events having excellent database of EU collaborators and interesting novel topics to offer for the further collaboration. Upgrading the RTD capacity – enhancement of knowledge and competences of TTF’s researchers. Protective textiles offer great potential for innovation, economic growth and employment. TSRC, upgraded to be strong RTD support for industry is becoming an important regional research centre. The aim of the TTF to produce applied research results and highly educated experts in the field is supplemented by the formation of the TSRC. The development of strategic partnerships with three high quality RTD institutions and one SME reinforced the research potential of TTF. New areas are opening for our research group. We have started with protective textiles (functional textiles) and at the moment we orient our research further to the huge area of nanotechnology & nanostructures. Our further goal is to establish our microscopy group in the area of identification and characterisation of nanomaterials (EDS – chemical analysis) and our thermal analysis group (EGA analysis for determination of harmfull particles). Enhancement of Textile Science Research Centre visibility One of the most important dissemination activities is enhancement of visibility of TSRC and T-Pot project through 3 important means of communication: TSRC portal, T-Pot web page and STEP web page. TRSC portal is becoming a significant tool for partner search and technology market place for local companies. Finally, a wealth of information and useful documents produced through project contributes significantly to broadening of the knowledge database. Last but not least, well established cooperation with media ensures timely information on all project related events and continuous visibility. During the project life, TSRC portal established itself as a focal point to look for actual information and assistance in textile sector, a valuable link and source both for the textile sector and media. Better integration of TTF and Croatian SMEs in the ERA The research potential of TTF and TSRC is significantly upgraded through T-Pot project, enabling TTF and TSRC to contribute to ERA with world-class research. Building up on its new capacities, previous ERA experience and a reputation of the leading national and regional center for textile research, TTF will strengthen its role of a knowledge center and focal point for integration of Croatian SMEs in ERA. TTF will significantly contribute to promotion of the European Technology Platform (ETP) For the Future of Textiles and Clothing. Very few Croatian organisations are involved in Future of Textile and Clothing (FTC) platform, mostly SME Associations – Croatian Chamber of Economy (CEA) and Croatian Employer's Association and only few industrial representatives. An accent is laid on cooperation with Croatian Cluster for Special Equipment, consisting of 13 SMEs – producers of primary textile industry, ready-made wear and footwear. With its new capacity, TTF can take even more active role to assist SMEs in future participation in EU funding schemes and better integration in ERA. Contribution to regional capacity building T-Pot project is gathering all major stakeholders in the region in the field of textiles & clothing, becoming a strong point of knowledge transfer and industry support. TSRC, upgraded to be strong RTD support for industry, is becoming an important regional research centre. The results of T-pot contribute significantly to the innovation, competitiveness and economic growth potential of regional textile industry. Main dissemination activities One of the important dissemination goals was to enhance the rate of proposals submission. Beneath is the list of the projects submitted by the group of experienced researcher prof. Katovi?: 1. Submitted projects 1) FP7-PEOPLE-2010-CIG (Marie Curie Career Integration Grants): Multifunctional zeolite-cellulose composite materials (ZEOCELL). Applicant: Andrea Katovic. ESR: 61.20/100 – NOT FUNDED 2) FP7-PEOPLE-2010-IEF: (Marie Curie Intra-European Fellowship): Antimicrobial polylactide for food packaging (AM-PLA). Applicant: Marina Turalija. ESR: 67.20/100 – NOT FUNDED 3) FP7-NMP-2011-SME-5: Advanced Textile solutions for pollution recovery from Oil Spills in Extreme Conditions (TEXOTREME). Applicant: Sandra Bischof Vukusic for TTF. Collaboration with project partners STFI and GZE. First stage: Positive evaluation Second stage: ESR: 11.1/15 – NOT FUNDED 4) IPA 2007 HR 16 I PO 001: Nanotechnology for enhancement of science/industry collaboration ? Reference: EuropeAid/131920/M/ACT/HR, Regional Competitiveness - Joint submission with LEITAT ? Submitted: October 2011 – WAITING FOR THE EVALUATION RESULTS. 2. Funded projects: 5) Unity through Knowledge Fund (UKF) 2A: Antimicrobial functionalisation of PLA polymer. Applicant: Marina Turalija. - Republic of Croatia, Ministry of Science, Education and Sports & EMPA, Swiss Federal Laboratories for Materials Science and Technology - Science and Technology Project, World Bank Loan No. 7320-HR 6) Development fund of the University of Zagreb: Revitalisation of traditional textile crafts for Spanish Broom production – Development of autochthon products Applicant: Sandra Bischof Vukusi? and Zorana Kova?evi?. - Project is accepted for funding from 1st January 2012 – 31st December 2012 3. Planned projects: 7) FP7-SEC-2012.1.4-1 Protective clothing for law enforcement and first responders – Capability Project - Joint submission with STFI and INFMP. Full list of all dissemination activities is presented within Template A2.