



# Regional Competitiveness Initiative (RCI) Working Group on Innovation

Project FP7-REGPOT-2008-1-229801: Unlocking  
the Croatian Textile Research Potentials

Project acronym: T – Pot

Project logo:



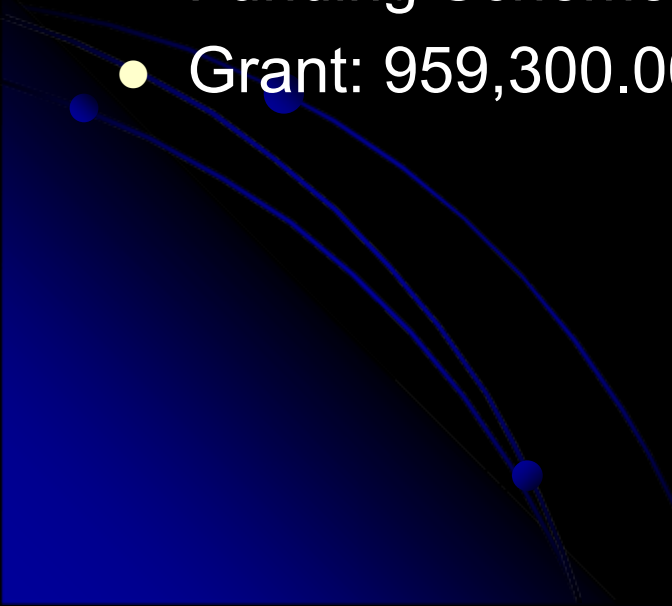
Presented by:

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University of Zagreb Faculty of Textile Technology


9th June 2011, Split, Croatia

# FP7-REGPOT-2008-1-229801

- Project duration: 01/03/2009 - 28/02/2012
  - Single partner beneficiary: UniZG TTF
  - Project coordinator: Prof. dr. Sandra Bischof Vukušić
  - Funding Scheme: CSA, FP7
  - Grant: 959,300.00 €
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# T-Pot Context

- 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.
  - 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.
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# Project objectives

1. Reinforcement of S&T potential
2. Developing strategic partnerships with well established research groups
3. Supporting and mobilising the human & material resources
4. Facilitating communication between the centres having similar scientific interest
5. Disseminating scientific information and research results
6. Improving the responses to socio-economic needs of Croatia

# Project main deliverables

Number	Name	Date
D.6.1	Setup and maintenance of Textile TSRC Portal <a href="http://www.ts-rc.eu">www.ts-rc.eu</a>	M2
D.2.2	Employment of 3 PhDs	M6
D.3.1	Recruitment of experienced researcher	M7
D.4.1	Establishment of 2 laboratories	M12
D.5.1	Workshops	M3-17
D.6.1	Books: 1) Young scientists in protective textiles research 2) Functional Protective Textiles	M24 M34
D.6.5	T-Pot, TSRC Brochures	M30

## D.6.1 TSRC Portal

**Textile Science Research Centre (TSRC)**  
**Znanstveno-istraživački centar za tekstil**



<http://www.ts-rc.eu>

## D.3.1 – Recruitment of experienced researchers

- Temporary employment in 1 year duration
- Looking for the possibilities for stable position of Prof. Katović at TTF



Prof. Andrea Katović, University of Calabria,  
Department of Chemical Engineering and Materials

## D.5.1. Organisation of workshops

- **Organized by partnering institutions:**

- Leitat (Terrassa, Spain) from 16<sup>th</sup> till 19<sup>th</sup> June 2009
- STFI (Chemnitz, Germany) from 29<sup>th</sup> November till 4<sup>th</sup> December 2009
- INFMP (Poznan, Poland) from 15<sup>th</sup> till 17<sup>th</sup> June 2010.

- **Organized by TTF:**

- & Croatian Chamber of Commerce:
  - from 21<sup>st</sup> till 23<sup>rd</sup> September 2009
- & Croatian Chamber of Trades and Craft:
  - from 9<sup>th</sup> till 11<sup>th</sup> May 2011



# Project Team

- **Single entity beneficiary: TTF**
- **Partnering Institutions:**



**STFI**

Germany



**INFMP**

Poland



**Leitat**

Spain



**GZE**

Italy

# Main project milestones and actions

Number	Name	Timeline
M.2.1	Establishment of strategic partnerships (Germany, Spain, Italy, Poland)	M1-6
M.3.1	Employment of experienced researcher	M6
M.4.1	Purchase of equipment (SEM, DSC, TGA, FTIR)	M1-6
M.5.1	Finalization of first workshop	M5
M.6.1	Selection of data for textile portal	M2
M.6.2	Installation of T-Pot web site	M1
M.6.3	Identification and acceptance of speakers for the Textile forums	M3

# Immediate Impact

New research group, supported with 2 new laboratories, 3 PhD students and 1 experienced researcher from University of Calabria, is formed and successfully integrated into the TTF research environment.



- New research T-Pot group

# Textile Science Research Laboratory at the Department of Textile Chemistry & Ecology



T.4.1. TGA

T.4.2. DSC

T.4.3. FTIR

*System of: FTIR spectrometer, TG-IR interface and TGA (Perkin Elmer)*

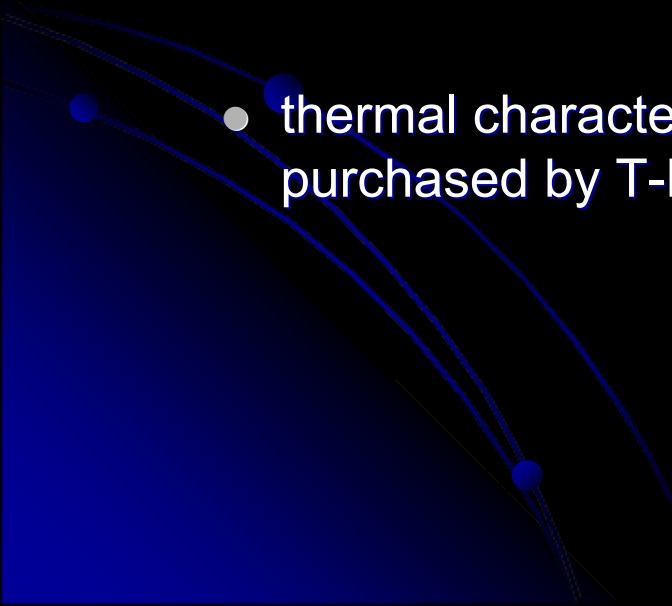
# SEM Laboratory at the Department of Textile Chemistry & Ecology



T.4.4. SEM

*Field Emission Scanning Electron Microscopy, Myra II LMU, Tescan*

# Mainstreaming

- The new research focus is on *protective textiles*, one of the *Lead market initiatives (LMI)* of ETP, taking into account its:
    - morphology characteristics (determined with SEM) and
    - thermal characteristics (determined with DSC and TGA), purchased by T-Pot project.
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# Textile Science Research Centre (TSRC)

## Laboratories

### LABORATORIJ ZA ISPITIVANJE GORIVOSTI MATERIJALA



Mikrokalorimetrom za sagorjevanje (MCC) mjera se različita svojstva goriva materijala. Uzorcima od svega nekoliko miligrama mjeri se temperatura paljenja, kalorificna vrijednost otpuštene topline, otpornost na gorjenje i dr.



MCC-2 (GÖTEBORG)

LOI (GÖTEBORG)

LOI uređaj za mjerenja granulnog indeksa kisika točno određuje relativnu zapaljivost materijala mjerenjem minimalne koncentracije kisika potrebna za izgaranje. Testirani uzorak za palu u predno kontroliranoj atmosferi dušika i kisika.



APARATURA ZA BITIRANJE GORIVOSTI TEKSTILNIH MATERIJALA PO RUTEM OD 9-20 MP



### TSRC USLUGE

Znanstveno istraživački centar za tekstil (Textile Science Research Centre) nudi kao svoje usluge znanstveno-istraživačku opremu i ljudske kapacitete.

Otvorani smo za suradnju sa:  
- znanstveno-istraživačkim institucijama  
- gospodarstvom.

Nudimo suradnju putem:  
- znanstveno-istraživačkog rada  
- znanstveno-istraživačkih projekata  
- HR II EU.

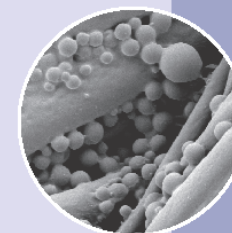
TSRC je sufinanciran sredstvima projekta FP7-REGPOT-2008-1-228801-T-Pot, financiranog od Europske komisije (EC).

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### LABORATORIJSKA OPREMA



SCIENCE RESEARCH CENTER  
www.ts-rc.eu

### ZNANSTVENO-ISTRAŽIVAČKI CENTAR ZA TEKSTIL (TSRC)

### SEM LABORATORIJ

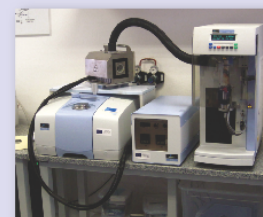
(SKENIRAJUĆA ELEKTRONSKA MIKROSKOPIJA)



FE-SEM BIVOLTAU-48 (TEKNOLOGIJA BOX DETECTOR (KULMBERG))

Skenirajući elektronski mikroskop SEM omogućuje detaljnu analizu uzoraka uz praktično povećanje do 100.000 puta. Povezan je EDX detektorom za elementarnu kemijsku analizu (Bruker AXS Mikroanaliza). Mikroskop je vođen računskim programom koji omogućuje analizu slika sa kvantitativnom obradom podataka. Kako je za ovu vrstu mikroskopije nužan predmetnik električno vodljiv promatranog uzorka, nabavljen je i napravljen na bazi zleba, peludnja i ugljika. SEM mikroskopija omogućuje promatranje morfologije uzorka.

### FIZIKALNO-KEMIJSKI LABORATORIJ ZA TERMIČKE ANALIZE I FT-IR SPEKTROSKOPIJU



SPECTRUM 161 FT-IR, SPECTROANALIZATOR SA TOPIJEM BUČELEM (PERKIN ELMER)

PTDSC 1 TDA (PERKIN ELMER)



DSC 800 (PERKIN ELMER)

Uređaj za termogravimetrijsku analizu TGA mjeri gubitak mase uzorka tijekom zagrijavanja u određenom temperaturnom rasponu (25°C – 650°C) i određenoj atmosferi (dušik, zrak, helij). Ovim metodom moguće je odrediti točku isparavanja, sublimacije, degradacije, odnošno dekompozicije, kao i nepovratnu kvantitativnu analizu uzorka. Uveliko je uređaj spojen TGAIR sustavom na FT-IR spektrometar moguće je analizirati i plinovite produkte nastale zagrijavanjem uzorka. FT-IR spektrometar služi za kvalitativnu, kvantitativnu i strukturnu analizu materijala. Iz infracrvenog spektra mogu se dobiti podaci o kemijskoj prirodi i molekularnoj građi ispitivane tvari.

DSC uređaj mjeri promjenu toplinskog toka kao funkciju temperature ili vremena ispitivanog uzorka u odnosu na referentni. Usljed zagrijavanja ili hlađenja uzorka prate se endotermne ili egzotermne reakcije uslijed kojih dolazi do promjene stanja čine se posebno uvelike točba taljenja, kristalizacije, isparavanja, sublimacije, oksidacije, oksidativne degradacije, termičke dekompozicije i dr., a rezultati se mogu primijeniti za proučavanje i razvoj novih polimernih materijala. Ova metoda korisna je za određivanje čistoće uzorka, toplinskog kapaciteta i dr. DSC radi u inertnoj atmosferi dušika i u temperaturnom rasponu od -70°C do 600°C.

# Key Lessons Learned

- **SPECIFIC CAPACITIES**

- Material and human capacities have been strengthened as direct result of T-Pot project.
- Material capacities: 2 new laboratories were established
- Human capacity: 3 new PhD students were employed and trained for the work at the highly sophisticated equipment.

- **SPECIFIC PROBLEMS**

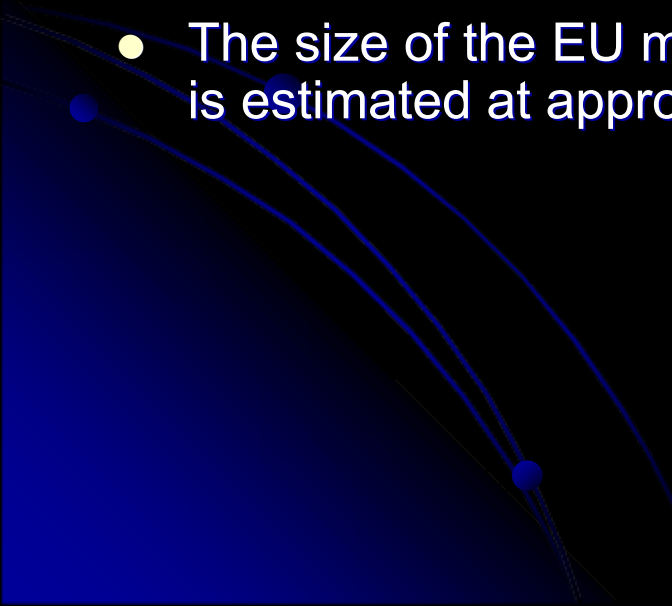
- Croatian SMEs from T/C sector are often forced to deal with short term existential issues, which impacts their active participation in the T-Pot project activities

- **POSSIBLE IMPROVEMENTS**

- greater support of SME Associations: Croatian Chamber of Economy (CCE) and Croatian Employer's Association (CEA) and its *Cluster for Special Equipment*



# Implementation at the regional level

- **Protective textiles** are offering *great potential for innovation, economic growth and employment.*
  - Already in 2007, this topic has been identified as one of the 6 Lead Market Initiatives
  - The size of the EU market for Personal protective equipment (PPE) is estimated at approx. 8 billion €
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# Implementation at the regional level

- **Development of strategic partnerships** with three high quality RTD institutions and one SME:
    - reinforced the research potential of TTF
    - increased the expertise and know-how transfer towards the SME
    - enhanced the knowledge and competences of researchers (both from academy and industry).
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# Implementation at the regional level

- **TSRC**, upgraded to be strong RTD support for industry is becoming an important regional research centre.
- Up to now, TTF has been involved mostly in Eureka and bilateral projects and at the moment 3 FP7 projects are running and 5 new have been submitted.
- Through this project, the research potential of TTF and its TSRC are unlocked enabling future participation in EU funding schemes and **better integration in ERA.**

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