



EUROPEAN UNION



GOVERNMENT OF ROMANIA



SERBIAN GOVERNMENT



Structural Funds
2007-2013



Romania - Republic of Serbia IPA Cross-border Cooperation Programme

POCAL Project - achievements and expectations

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Romania-Serbia

Common borders. Common solutions.

Cross-border Cooperation Programme

Partners

- Politehnica University of Timisoara, Timisoara, Romania (UPT)
- Mining and Metallurgy Institute Bor, Bor, Serbia (MMI Bor).



Our Joint Project

Pole of Collaboration in New Functional Alloys -POCAL-

Programme objective(s)	<ul style="list-style-type: none">➤ Increasing the overall competitiveness of the economy in the border area➤ Improvement of the quality of life for the communities of the border area
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- **Priority axis objective(s)**
- Support for research and development events - conferences, meetings, workshops
- Creation of and access to R&D cooperation networks
- Support for research, development and innovation centres
- Joint initiatives of cooperation between economy and research

Goal

- To develop a cross-border network for R&D in New Functional Materials Engineering, adapted to the specific areas of interest (metallurgy) and novel developments (functional, multifunctional and intelligent materials as well as micro and nanoengineering) in the field

Via:

- transfer of knowledge for the beneficiaries looking for continuous education (from their existing aptitudes in metallurgy into novel materials fabrication),
- a base for research and training for students and researchers
- information and connections through collaboration, for beneficiaries looking to develop independent activities in the field of Advanced Materials and Micro/Nanoengineering.

Project focus

- The Priority axis **Support increased levels of R&D and innovation in the border region** objectives will be achieved by focusing on:

Excellence in innovation and transfer of knowledge through the creation of a cross-border partnership for an R&D aiming to develop Novel functional materials.

Development of laboratories equipped for addressing new challenges related to Novel Materials
Exploration with open access for future partners interested in developing industrial products

Spreading knowledge in the border regions by organizing R&D events.

Preparing the transfer of knowledge from R&D toward practical applications in the benefit of the cross-border area.

Main Objectives

- Creation of POICAL Cross-Border Network
- Development of interconnected innovation clusters
- Joint research in Advanced Functional Materials
- Design of the transfer of knowledge mechanisms
- Promotion activities
- Development
- Preparation for self-support

Project activities / achievements

No.	Activity	Starting date	Completion date	Location (county)	Responsible Partner
1	Design & implementation of POCAL mechanisms	Month 1	Month 3	Timis	UPT
2	Media campaign and POCAL web portal	Month 1	Month 12	Borski and Timis	UPT
3	Focusing meeting	Month 1	Month 3	Borski	MMI Bor
4	Study of regional needs and opportunities	Month 1	Month 3	Borski	MMI Bor
5	Updating the fabrication and functional exploration laboratory	Month 2	Month 10	Timis	UPT
6	Publication in special issue of Jour-nal "Copper" pu-blished by MMI Bor (2volumes/year)	Month 3	Month 12	Borski	MMI Bor
7	Set up of the microstructural investigations laboratory with acquisition of specific equipment and training of people	Month 3	Month 10	Borski	MMI Bor
8	Materials development and optimization	Month 1	Month 12	Timis	UPT
9	Materials characterization	Month 1	Month 12	Borski	MMI Bor
10	Demonstrator	Month 9	Month 12	Timis	UPT
11	Joint activities to publish scientific papers	Month 3	Month 12	Borski (and Timis)	MMI Bor
12	Participation in scientific international conferences and/or workshops	Month 3	Month 12	Borski Timis	MMI Bor
13	POCAL ToK Center	Month 10	Month 12	Borski	MMI Bor
14	Open day	Month 6	Month 10	Timis	UPT
15	Workshop	Month 9	Month 12	Borski	MMI Bor
16	Joint applications	Month 9	Month 12	Timis	UPT
17	Preparation for self-support	Month 9	Month 12	Timis	UPT

Research issues

- **Fabrication of advanced functional materials:**
- Alloy families:
 - conventional shape memory: CuAlNi, CuZnAl, NiTi, FeMnSi,
 - ferromagnetic: CoNiGa, NiMnGa, other
 - porous, films
- Other functional materials: Cu-based, Ti-Ta, Fe-Pd
- **Techniques:** arc melting, suction casting, spark plasma sintering,
- **Characterization:** microstructural (optical & electronic microstructure), Vickers hardness, DSC, Internal friction, tensile and compression testing, electric resistance
- **Development of applications:** based on shape memory alloys properties

Equipments we plan to purchase

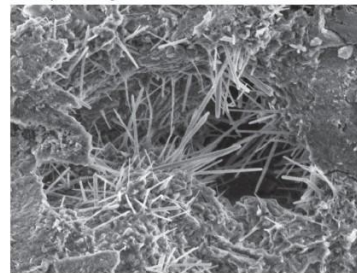
Object of Contract	Estimated Value*
Electron microscope	240.000
DTA-TGA-DSC devices	60.000
Spark plasma sintering unit	200.000
X-ray diffraction unit	115.000
High-vacuum micro-fabrication unit	95.000
Materials 1	8000
Materials 2	1000
Reagents 1	2500
Reagents 2	2000
Spare parts1	10000
Spare parts 2	2000

Equipments we plan to purchase

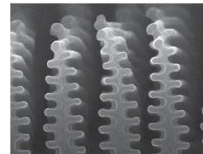
SEM-EDS



Secondary electron image



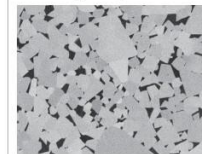
Scales of a butterfly wing observed with a high vacuum secondary electron image. The microstructure can be observed with improved resolution.



Backscattered electron image

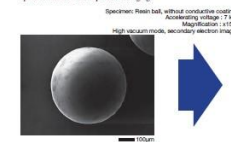
Option: **CV/C&R Standard**

A backscattered electron composition image of the cross section of cemented carbide. By observing backscattered electron composition images at a low accelerating voltage, the channelling contrast of each tungsten carbide particle can be observed.

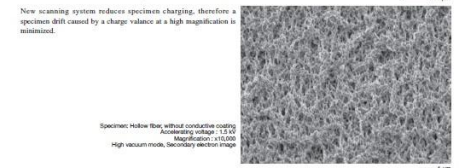


New scanning system for better image quality

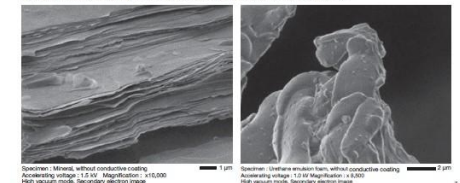
Charge-resistant frame integration simplifies observation of specimen that are susceptible to charging.



New scanning system reduces specimen charging, therefore a specimen drift caused by a charge valence at a high magnification is minimized.



Higher definition observation is achieved even for charge-susceptible specimens or beam sensitive samples.



Equipments we plan to purchase

DTA-TGA-DSC devices

LABSYS evo



LABSYS evo is a user friendly, robust and highly powerful thermal analysis platform.

HIGHLIGHTS include:

- A comprehensive line of thermal analyzers with two temperature ranges chosen and optimized for distinct families of application:
 - RT – 1 150 °C, a cost effective solution mostly (but not only) for organic materials studies (polymers, pharmaceuticals, petroleum by-products...)
 - RT – 1 600 °C, for demanding high temperature experiments involving mostly (but not only) inorganic materials like ceramics or metals.
- A top loading balance designed specifically for thermal analysis applications featuring unmatched stability, reproducibility and accuracy.
- Plug & play TGA, DTA, DSC and CP rods for the best Simultaneous Thermal Analysis experience users can get.
- A 30 samples/6 references autosampler able to automatically configure to the different sensors and crucibles.

GAS FLOW CONTROL

As many of the TGA and STA applications are gas-solid reactions, an accurate atmosphere control is a key point for a successful measurement.

Obviously, LABSYS evo is equipped with the possibility of gas flow (inert or reactive). A fully automated gas control panel with Mass Flow Controllers is also available as an option:

- Selection from 3 different carrier gases (flow rate: 4 to 200 ml/min),
- Mixing of these carrier gases with another auxiliary or reactive gaseous fluid (flow rate: 0.3 to 16 ml/min).

THERMOBALANCE & FURNACE

At the heart of the LABSYS evo is an advanced coiled metal furnace existing in two distinct temperature ranges (1 150 °C and 1 600 °C). It has been designed to provide a homogeneous temperature zone covering both the sample crucible and the measurement rod area. It is a key point for an accurate temperature determination of thermal events, and for stable DTA/DSC signals. The crossing furnace is ideally designed to be efficiently coupled to a gas analyzer.

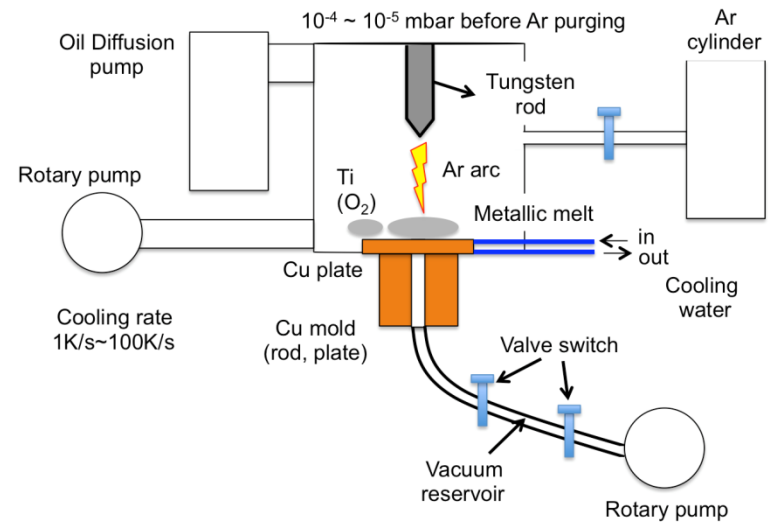
The top loading, thermostated balance of LABSYS evo was specifically designed for thermogravimetric analysis measurements and is manufactured in our workshop. It is based on the technique of a beam articulated around a torsion band, the most appropriate design for a stable and robust balance. It guarantees a reliable and sensitive measurement.



Schematic representation of the carrier (red) and auxiliary (orange) gas flows

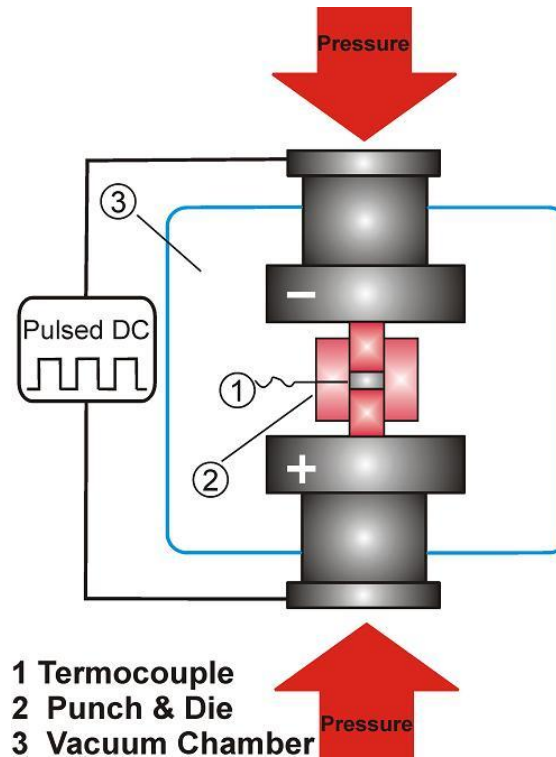
Equipments we plan to purchase

High-vacuum microfabrication unit



Equipments we plan to purchase

Spark plasma sintering unit



Equipments we plan to purchase



X-ray diffraction unit

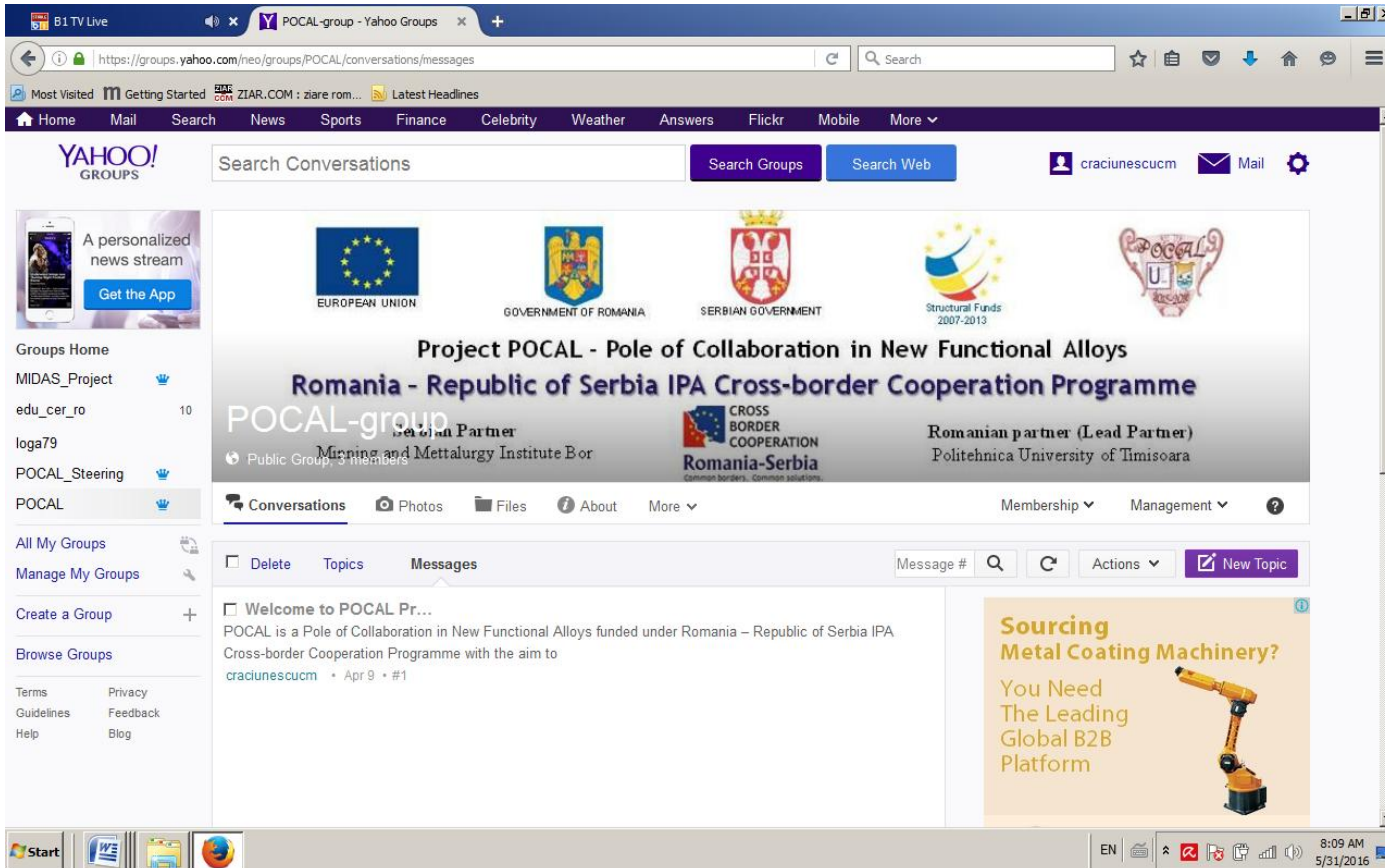
Expectations

- Continuation of the collaboration beyond the funding period
- Exchange of research materials and personell between the partners
- Interactions with industrial partners in the cross border region:
 - ToK Center
- Development of new applications based on the collaborations initiated through POCAL project

Communication

yahoo group

<https://groups.yahoo.com/neo/groups/POCAL/info>



The screenshot shows a web browser window displaying the POCAL Yahoo Group page. The browser's address bar shows the URL <https://groups.yahoo.com/neo/groups/POCAL/conversations/messages>. The page features a header with the Yahoo! Groups logo and a search bar. Below the header, there is a banner for the "Project POCAL - Pole of Collaboration in New Functional Alloys" under the "Romania - Republic of Serbia IPA Cross-border Cooperation Programme". The banner includes logos for the European Union, Government of Romania, Serbian Government, and Structural Funds 2007-2013. It also identifies the "Romanian partner (Lead Partner)" as Politehnica University of Timisoara. The left sidebar contains a "Groups Home" section with a list of groups: MIDAS_Project, edu_cer_ro, loga79, POCAL_Steering, and POCAL. The main content area shows a "Welcome to POCAL Pr..." message from user craciunescum, dated Apr 9. A sidebar on the right contains a "Sourcing Metal Coating Machinery?" advertisement.

Project POCAL - Pole of Collaboration in New Functional Alloys
Romania - Republic of Serbia IPA Cross-border Cooperation Programme

POCAL-group
Public Group • Romania

Lead Partner
Mining and Metallurgy Institute Bor

Romanian partner (Lead Partner)
Politehnica University of Timisoara

Conversations | Photos | Files | About | More

Messages

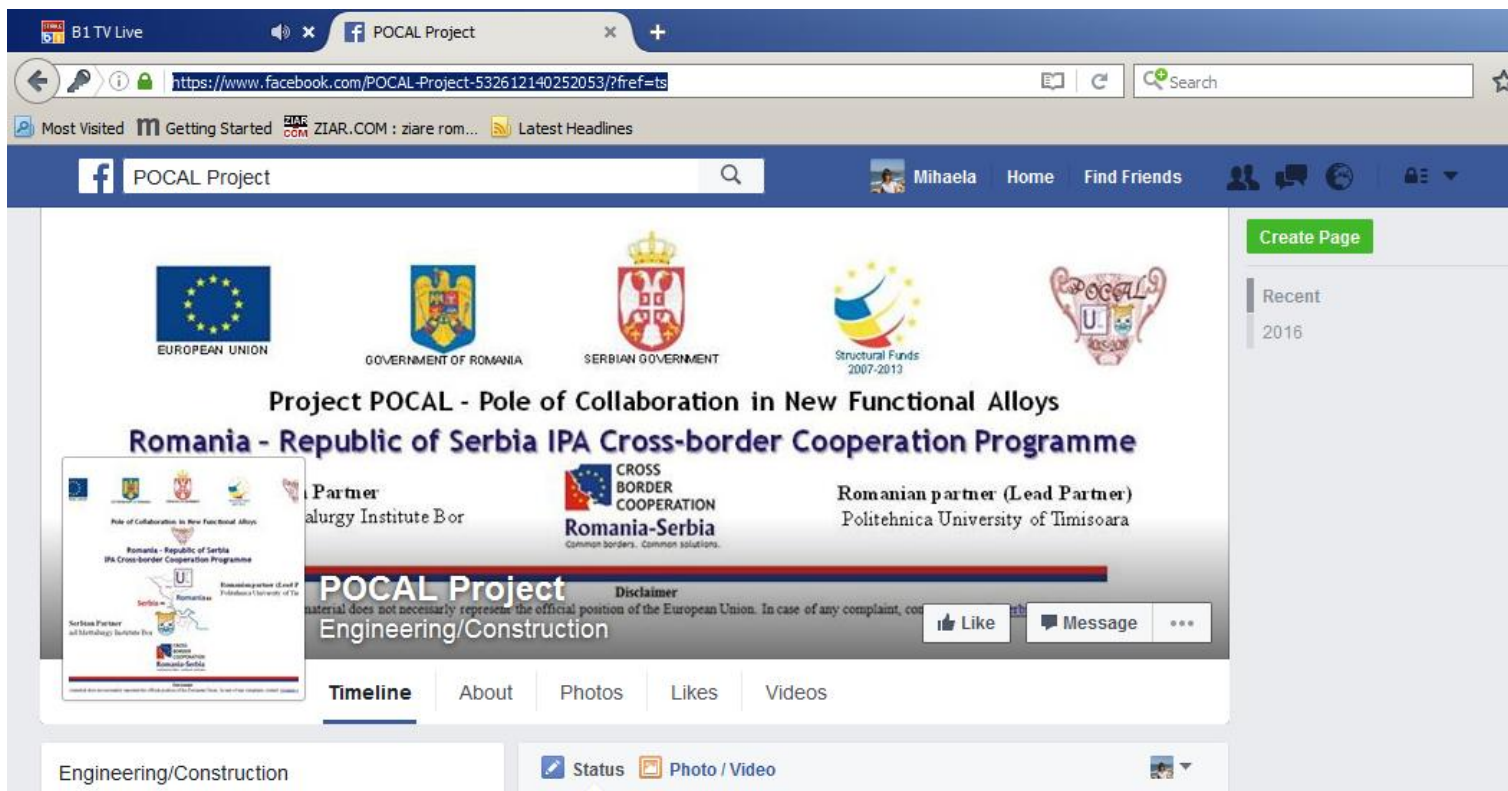
Welcome to POCAL Pr...
POCAL is a Pole of Collaboration in New Functional Alloys funded under Romania – Republic of Serbia IPA Cross-border Cooperation Programme with the aim to
craciunescum • Apr 9 • #1

Sourcing Metal Coating Machinery?
You Need The Leading Global B2B Platform

Communication

Facebook

<https://www.facebook.com/POCAL-Project-532612140252053/?fref=ts>



The screenshot shows a web browser displaying the Facebook page for the POCAL Project. The browser's address bar shows the URL: <https://www.facebook.com/POCAL-Project-532612140252053/?fref=ts>. The Facebook page header includes the name "POCAL Project" and a search bar. The main content area features logos for the European Union, the Government of Romania, the Serbian Government, and the Structural Funds 2007-2013. Below these logos, the text reads: "Project POCAL - Pole of Collaboration in New Functional Alloys", "Romania - Republic of Serbia IPA Cross-border Cooperation Programme", and "Romanian partner (Lead Partner) Politehnica University of Timisoara". A disclaimer at the bottom states: "Material does not necessarily represent the official position of the European Union. In case of any complaint, contact the project manager." The page also includes a "Create Page" button, a "Recent" section with the year "2016", and a "Timeline" section with tabs for "About", "Photos", "Likes", and "Videos". The page is categorized as "Engineering/Construction".

Thank you!

www.romania-serbia.net
