D.T3.4.6

3 success stories for communication

UPPER SILESIAN AGENCY FOR ENTREPRENEURSHIP AND DEVELOPMENT - POLAND

Document Control Sheet

Work Package Number	WPT3
Work Package Title	Experimenting the delivery of new KET access services at access points &joint/transnational RTO services
Activity Number	Activity A.T3.4
Activity Title	Pilot testing of joint service offers and related business models (KET TI &follower RTO)
Deliverable Number	D.T3.4.6
Deliverable Title	3 success stories for communication
Dissemination level	
Main author	Beata Krawczyk, Aleksandra Szczerbak-Ruta, Kamil Krzemiński (GAPR)
Contributors	
Quality Assurance	Alejandra Campos (SEZ)

Versioning and Contribution History

Version	Date	Author/Editor /Reviewer	Contributors	Description/Comments
_v01	25/8/2020	Beata Krawczyk, Aleksandra Szczerbak-Ruta, Kamil Krzemiński		
	25/8/2020	Alejandra Campos (SEZ)		Quality check
_final	28/08/2020	Beata Krawczyk, Aleksandra Szczerbak-Ruta, Kamil Krzemiński		

Document last saved on	28/08/2020

Table of Contents

1. Introduction

Short success stories have been created after pilot services implementation process and based on the SME-RTOs cooperation experience. Their role is to highlight the added value achieved for the serviced SME and to promote the smart KET Access & Service Network and transnational cooperation from the case studies. Success stories have been used as a communication tool, disseminated and shared to reach broad audience of stakeholders interested in joining the KETGATE Network.

2. Overview of success stories

Service providing to the SMEs listed below has been described in the success stories for the D.T3.4.6. The stories have been provided by the RTO partners that were involved in each pilot process.

SME with the service described in the success story	Responsible partners
Phoenix d. o. o.	Bay Zoltán Nonprofit Ltd., Jožef Stefan Institute
Balmar d.o.o.	Jožef Stefan Institute, Joanneum Research
Technometall Kft	Bay Zoltán Nonprofit Ltd., Joanneum Research

3. Annexes

3.1 Phoenix d. o. o. success story

3.2 Balmar d.o.o. success story

3.3 Technometall Kft success story

KETGATE Success Story

Information on RTO Success Story for the KETGATE Website

RTO	Bay Zoltán Nonprofit Ltd.		
Name of the Success Story	Cutting tools – lifetime increase		
KETGATE Story Code	Story-BZN-01		
Date	14.03.2019		
SME-Request Code	SR-TERA-01	RTO-Offer	

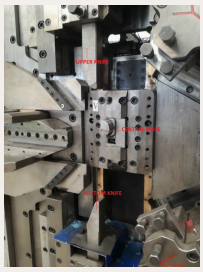
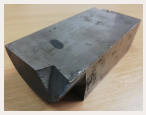
Information about the Project partner

Company	Phoenix d.o.o		
Contact person	David Durmiši	Position	
E-Mail	david@fortunafedern.com		
Telephone	+39 040 558 3446 - 3773		
Address	Dalmatinska 98a		
Homepage	phoenix-opruge.com		
City/ Country	HR-33515 Orahovica	Postal Code	33515

Success Story Code | Story-BZN-02

Information about the KETGATE Project

Picture

The Customer
Description of the company plus business activities.
(see SME-Request or homepage)

"Phoenix d.o.o " with over 50 employees in total has become global established producer of spring making machinery which is presented each year on the biggest shows for spring makers. Customers are placed all over the world from New Zealand over Japan, Asia and Europe to North- and South America.

At the 2000m² of fully equipped production area, Phoenix company can deliver variety of both customized and standard machines for spring making and wire bending industry.
The company consists of electrical, software, material heat treatment, mechanical design department. The production hall has over thirty machine(Miling, turning, grinding machine).

The Challenge
Description of the customer`s goals and needs.
(see SME-Request)

Our main problem is to improve mechanical properties of machine tooling (toughness, wear resistance)

Phoenix Ltd. produces spiral spring making machine of COM-20. Main critical elements of this machine are rollers, central knives, upper and lower knives produced by Phoenix as well. Due to the high loading of these parts damages of them are very serious. Great portion of knives and rollers material is broken away after a quite short working period, by this way the life time of them less than expected.

Success Story Code	Story-BZN-02

The Theme
Description of the offered solution to the customer`s needs.
(see RTO-Offer)

The main goal of the project is to investigate the damage of cutting tools used in spiral spring production, and work out proposal to improve tool lifetime. The results of this examination and proposal will be summarized in a report, which will have the following chapters:
1) The loading and damage of tools
a. Loading of tools by cutting process
b. Properties of the tool materials using conventional heat treatment
c. Characteristics of tool damage process (laboratory investigations)
This chapter focuses on the existing tool materials and the damage process of tools.
2) Applicability of advanced tool materials and treatments
This chapter seeks for novel tool materials or additional surface and/or bulk treatment of tools: the types of advanced tool materials, the requirements, the cost efficiency and other specifications.

The solution
Description of the elaborated solution.
(see RTO-Report)

Investigations presented above give a good possibility to compare the properties of different knives' materials, and by this way to determine the possible proposals improving knives' life time.

Phoenix should consider using tool steel made by PM technology or could ask other tool steel producers for this or similar grade made by PM process. The reliability of the heat treatment (hardening and tempering) process has to be improved.

Marketing results
Customer satisfaction and testimonials.
(E-mail, telephone, interview)

"Thank you for your thorough and detailed work. We will continue to work with you in the future, because your attitude and expertise will guarantee the success of our work." David Durmiši

KETGATE Success Story

Name of the Success Story:
Hybrid Additive Manufacturing and Coating of the Metal Structures

Project duration:
06/2019-09/2019; 06/2020-07/2020

Information about the Project partners

Company name:
Balmar d.o.o.

Address:
Kidričeva ulica 24A
3000 Celje

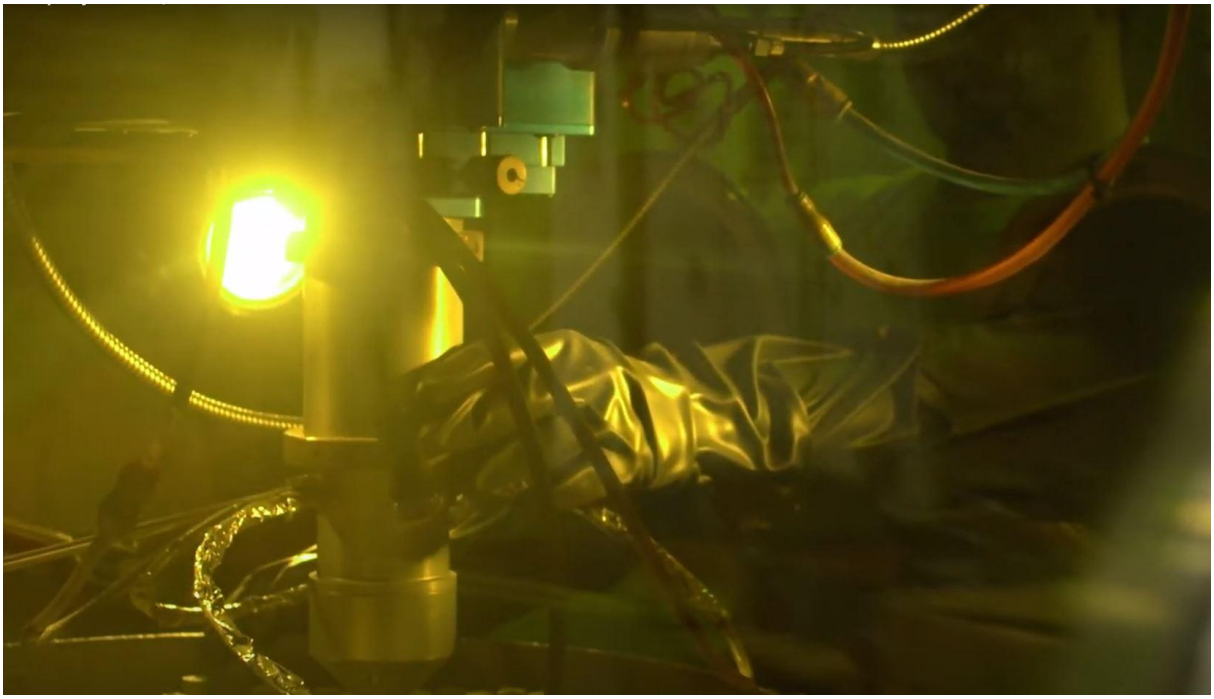
Country:
Slovenia

URL:
https://balmar.si/

RTO name: Jožef Stefan Institute Address: Jamova cesta 39, SI-1000 Ljubljana RTO country: Slovenia URL: https://www.ijs.si/ijsw/IJS	RTO name: JOANNEUM RESEARCH Forschungsgesellschaft mbH Address: Leobner Straße 94 A-8712 Niklasdorf RTO country: Austria URL: www.joanneum.at/materials

Information about the KETGATE Pilot Project

Picture:



Metal 3D printing at BALMAR d.o.o.

About the SME

Company BALMAR d.o.o. is a privately owned Small and medium-sized enterprise (SME), established in 2008 and located in Celje, Slovenia.

Major scope of company activities is focused into following industry sectors:

- Aviation sector – airline business, aviation consulting and training in aviation
- Space sector – space R&D activities, manufacturing and implementation of advanced metal parts
- Additive manufacturing – technology development and implementation, service provider and technology consulting.

The company offers services in Additive Manufacturing: Additive Manufacturing/3D Metal Printing (LENS Technology); Improvements of LENS Technology; Electronics Printing / Aerosol Jet® Technology for Electronics; Demonstration Centre; Consulting service in connection with Additive Manufacturing; Product development and evaluation based on Additive Manufacturing principle.

The Challenge

In industry often appears a need to effectively manufacture bigger parts with some complex geometries (example of cooling channels) and being built out of a special material like super alloys, titanium alloys and similar. Often such parts cannot be built in a manner as desired by the customer (with classical existent manufacturing technologies). Consequently, the need for alternative manufacture such as Additive Manufacturing (AM) appears.

Major disadvantage of the AM process is the manufacturing speed and relatively high manufacturing costs. In order to optimize this technology a Hybrid Additive Manufacturing Approach has been developed by the Balmar.
When such principle is being used, new intermetallic boundary layers between parts build by one and another AM Technology appears. Such boundary layer contains smaller-finer and bigger-rougher crystal structures which can consequently influence on the mechanical and materials properties of the built part.
The newly developed Hybrid Additive Manufacturing Approach is planned to be applied on aerospace parts, where a protection is needed. Hard coatings are a suitable way of providing mechanical protection.

About the RTO JOANNEUM RESEARCH
JOANNEUM RESEARCH (JR) develops solutions and technology for business and industry in a wide range of industries and operates cutting-edge research on an international level. As innovation company with a focus on applied research and technology development it plays a key role in technology and knowledge transfer. JR is a business-driven innovation and technology provider with cutting-edge research for more than 30 years. The staff of JR has expertise in additive manufacturing technologies like Powder Bed Fusion (PBF) and Directed Energy Deposition (DED) for industrial applications. All project members gained extensive project management experience in several national and international R&D and network projects.

About the RTO Jožef Stefan Institute
The Jožef Stefan Institute (JSI) is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. The staff of more than 1000 specializes in natural sciences, life sciences and engineering.
The main research activity of the Department of Thin Films and Surfaces, JSI are hard coatings for protection of tools and machine parts against wear. Hard coatings considerably decrease wear; therefore, the tool lifetime increases several times. Using different deposition units, the Department offers the deposition of various PVD coatings: TiN, CrN, TiAlN, TiAlSiN and aCN, as well as others upon request.

The solution
In this project JOANNEUM RESEARCH - MATERIALS provided valuable expertise in Powder Bed Fusion (PBF) fur further tasks performed by Balmar d.o.o., which applied the Hybrid Additive Manufacturing Approach. After the samples were prepared Jožef Stefan Institute deposited PVD coatings as well as investigated the surface properties with microscopy and standard tests.

TECHNOMETALL

Bay Zoltán
Alkalmazott Kutatási
Közhasznú Nonprofit Kft.

An international collaboration of research institutes for solving the technological problem of a Hungarian small and medium-sized enterprise

The main profile of Technometall Kft. in Sárospatak is machine tool manufacturing, design and construction. In addition to manufacturing complete cold forming tools, they also specialize in the production of tool elements or other high-precision machined parts.

The intention of the company was to make some parts of steel punching tools easier, faster and more cost-effective than by the means of the classic process. With the help of the business consultant of the Bay Zoltán Research Institute, the needs of the company were precisely identified, and then a study on the feasibility of the idea was carried out with the involvement of the Austrian Joanneum Research Institute.
The measured geometry values of the printed part did not suit to the planned geometry values. For this reason, it was recommended that the printed part (for example the holes geometry) should be post manufactured.

The Bay Zoltan Institute was given the role in this project to perform the validation material tests which results can be used for further development for TM Ltd. Since the printing job was stopped, the surface roughness has been measured on the side of printed part.

We can conclude that based on test results, the applicability of the new technology for the producing of this tool can be decided.

(Different material tests were planned and carried out on the original material and the new prepared tool made by additive manufacturing to compare the mechanical properties of these two materials. Also a geometry test on the printed part was performed to inspect the accuracy of printing job.
Geometry accuracy, strength properties, hardness, metallographic characteristic, fatigue and fracture mechanical properties were compared.

Material tests on the molded part and printed part have been performed. In conclusion, can be stated the managing steel have better material properties in several cases. The printed part reaches higher strength properties and hardness value than molded part and yield strength and tensile strength can be increased further with ageing. In contrast, the results of fatigue test and fracture test show, the originally used material has higher fatigue strength and fatigue limit than the printed material and is more resistant to fatigue crack growth than printed part.)

https://www.youtube.com/watch?v=DfFMw-PnJ34