

“POLITEHNICA” UNIVERSITY OF BUCHAREST

CENTER OF TECHNOLOGICAL ELECTRONICS AND INTERCONNECTION TECHNIQUES

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Background Information

The Center of Technological Electronics and Interconnection Techniques (CETTI) was founded approximately ten years ago according with the new Romanian legislation for education and research. Like similarly center in the world the main objectives of CETTI are to offer substantial support in electronic packaging activities for innovative SMEs and to sustain educational and training for continuing education of the human resource involved in electronic industry. The center initial was focused, for students and engineers, mainly on printed circuits board PCB CAD training activities. Beginning with 1997 CETTI achieves grants in the framework of the **Program of Higher Education & Research, RO 4090**, funded by **World Bank** and **Romanian Government**. In the same time CETTI was present in several funding programs, including EU and so step by step it succeeded to become a well known an electronic packaging center in Romania and not only, having cooperation with American and European universities and organizations (see Appendices).

CETTI operates as an “Electronic Packaging Services and Research” Department within the University POLITEHNICA of Bucharest (UPB), the largest and oldest technical university in Romania.

Since its conception, the CETTI has continually expanded its operations. The CETTI currently focuses on the following area of activity:

- **Electronic Packaging Counseling and Training (lectures & seminars);**
- **Management and Marketing Training Programs tailored to the client’s needs;**
- **Electronic Packaging Information and Research;**
- **Founding and Sustaining the Romanian Electronic Packaging Network NETPACKRO ;**
- **Organizing student contests and students local meetings.**
- **Supporting students to be involved in IEEE CPMT Student Branch Chapter;**
- **Training Programs for the counselors and staff from SMEs;**
- **Organizing regional conferences in field of electronic packaging;**
- **Computer Training and Services for Business.**

CETTI Mission

The mission of the CETTI is to support the local economic development and modernization of the higher education in Romania, providing a wide range of educational activities and services for electronic packaging (as counseling, training, research and information, human resource) and manufacturing - professionally, confidentially and non-discriminatory offered mainly to the business owners and managers - at an international standard, using the most advanced American and European expertise.

CETTI Objectives

As the business climate evolves in Romania, the CETTI's primary objective is to consolidate, expand and develop new programs in the areas of electronic packaging, counseling, research, training and manufacturing, technological skills education and related support programs.

CETTI continuously adapts the services it offers in order to successfully meet the rapidly changing information, counseling and training needs of its customers.

Business Consulting & Service Principles

There are three basic concepts that guide the CETTI and the NETPACKRO network:

- **Confidentiality.** Client's information is private and cannot be disclosed by the Center or by the counselor without specific written permission from the client.
- **Conflict of interest.** A counselor is not allowed to profit personally from the use of a client's business information.
- **Advice and responsibility.** Counseling is a collaborative process. All recommendations offered by the counselor are up to the client to evaluate and apply to his/her own business situation. This means that the client must assume the risk, and the potential for success, that comes with any business decision.

Center facilities

The CETTI can offer its clients' access to the following:

- Training network in Computer aided design of PCB and electronic modules, advanced CAD Programs
- PCB prototypes engraving equipment;
- A integrated computer network, developed by a router and switch concept, using server based computing facilities;
- Surface Mont Technology manufacturing line for prototyping, small or medium size electronic package series
- Optical inspection for electronic modules;
- Repair & Rework stations for a very large range of SMT/THT components;
- High performing measurements of passive components and circuits in the range of 100 kHz...1.8 GHz.
- EMC precompliance measurements for electronic systems (up to 1 GHz)
- A comprehensive electronic packaging library with more then 50 top books;
- Direct international telephone and fax service
- E-mail and INTERNET access
- Seminar facilities with the flexibility for large or small meetings
- CD-ROM data base of electronic packaging information
- Photocopier, printers, scanner

Professional Staff and Expertise

The CETTI staff is currently composed of 19 persons (2 university professors, 2 university lecturers, 3 senior trainers, 3 senior researchers and 7 junior researchers and 2 administrative staff).

CETTI runs a two level training and certification program for electronic packaging field in order to form experts in this domain: PPE (Professional Packaging Expert) and MPE (Master Packaging Expert) According to the needs, CETTI cooperates with Romanian and international experts and professors in the related fields of expertise.

Our staff's experience includes the following areas of expertise applicable to electronic packaging and electronics technology counseling and training and leads to the following professional course modules (lectures and training):

- Design, research, development and manufacturing of electronic modules for analog, digital, and mixed A/D applications
- Modeling and simulation in the field of electronic circuits and modules
- Complex electromagnetic modeling, simulation, and measurements;
- Complex thermal modeling, simulation, and measurements, thermal management;
- Electronics technology – SMT/THT.
- PCB design and manufacturing, including “green” fabrication processes;
- Complex measurement techniques using VNA (Vector Network Analyzer) and TDR (Time Domain Reflectometry) equipment.

The Major CETTI Programs

- Electronic Packaging Training Program (EPTP) - training and counseling for managers and co-workers from companies, adjusted according to needs of customers;
- Implementing Electronic Packaging Research Teams in SMEs (EPRT) - training, counseling and research program;
- Supporting ARIES (Romanian Association for Electronics Industry and Software) in organizing technical and scientific events and for promoting the electronics activities in Romanian national programs;
- Professional dissemination workshops;
- Professional international symposia and conferences;
- Professional and master electronic packaging counselor training programs;
- Management in technology and electronic packaging;
- Training seminars for Marketing in Electronics Industry (MEI) and Human Resource (HR);
- Training and counseling programs focused on customers' needs;
- Supporting the IEEE-CPMT POLITEHICA University of Bucharest Student Branch Chapter, founded on December 2000 by the students and PHD students from PUB University (Advisor Prof. Paul Svasta). The Chapter provides networking opportunities with other professionals and offers the chance to participate in technical and educational activities for technological skills development. In the year 2003 the Chapter, was awarded by IEEE-CPMT Society with the “ 2003 Best Student Branch Chapter of the Year Award” (<http://www.cetti.ro/sbc/award.html>);

Network Relationship

CETTI has special network relationship with the NETPACK-RO based on the main Romanian technical universities located round the whole country: Cluj-Napoca (Technical University of), Iasi (“Gh.Asachi” Technical University), Timisoara (“Politehnica” University of Timisoara), together with two young universities University of Pitesti and “Stefan cel Mare” University of Suceava.

CETTI within *NETPACK RO* developed the dissemination network *International Symposium for Design and Technology of Electronic Packages SIITME* (www.siitme.ro). This conference is an annual event in Central and Eastern Europe since 1995. It was held for the first time in Bucharest and during the time it moves through whole Romania (Cluj-Napoca 2002, Timisoara 2003, Bucharest 2004, Cluj-Napoca 2005, Iasi 2006). In September 23-24, 2004 celebrating the 10th edition jubilee it will take place in Bucharest. SIITME is a conference with a high scientific level, with regional interest for Central and South-Eastern European countries, having a branch oriented toward SME's that acts in the field of electronics and wish to improve and to implement new electronics technologies and innovation transfer .

CETTI within **NEPACK RO** and **IEEE CPMT “Politehnica University of Bucharest” Student Branch Chapter** developed the national student CAD contest for electronic board interconnection structure;

CETTI within the major European **NEPACK** members developed *the International Spring Seminar on Electronic Technology* important event in **IEEE CPMT** agenda. The 24th edition (May , 2001) of *ISSE* with **IEEE-CPMT technical sponsorship** was organized by **CETTI** in *Calimanesti-Caciulata, Romania..*

CETTI has also relationship with the Romanian Chamber of Commerce and Industry, National Council for Private SMEs, and the Department for Inovation and Technological Transfer of Ministry for Education and Research.

CETTI cooperates with universities from European countries (Technical University of Vienna, -Austria, Technical University of Prague- Czech Republic, Technical University of Dresden and Technical University of Darmstadt-Germany, Technical University of Kosice - Slovakia, University for Technology and Economics, Budapest- Hungary, Technical University of Warsaw and Technical University Rzeszow, Technical University of Wroclaw –

CETTI cooperates with research institutes (Fraunhofer Institute für Zuverlässigkeit und Mikrointegration Berlin and Munich- Germany, TeleRadio Institute Warsaw-Poland, Josef Stefan Institute Ljubljana- Slovenia, ICPE CA, Bucharest, Romania);

CETTI is associated with the European Network of Excellence NETPACK in the FP 5 and 6 programs (<http://education.netpack-europe.org/lectu.php>)

CETTI has a special relationship with the Romanian Association for Electronic and Software Industry (ARIES), the largest association of IT &C companies in Romania (over 250), mainly private companies;

Membership

- Association Connecting Electronics Industries IPC, USA (1997)
- Romanian Association for Electronic and Software Industry ARIES, Romania (1994),
- International Microelectronics And Packaging Society IMAPS- USA (1997);
- Romanian Association for Electromagnetic Compatibility, Romania (1999)

Recognition

The Center of Technological Electronics and Interconnection Techniques received the “Center of Excellence Diploma” 2001, for outstanding programs for electronic packaging activities, offered by the Ministry of Education and Research, ROMANIA

Experience in International Cooperation

PHARE Program “Establishment of Low Cost Mulchip Modules in Benefit of European Industry”, INCO-COPERNICUS (1997-2000), partners IMEC Belgium, BUTE Hungary, Welding Institute UK, Josef Stefan Institute, Ljubljana and HIPOT Company, Slovenia.

EU-FP 5: IST Program (*ENHANCED ACCES TO SYSTEM INTEGRATION TECHNOLOGIES* EASIT) – 1999/10712 partners (Fraunhofer Institut für Zuverlässigkeit und Mikrointegration Berlin, Germany, ACREO Sweden, IMEC Belgium, BUTE Budapest, Hungary, Josef Stefan Institute, Ljubljana, Slovenia, Wroclaw University for Technology, Wroclaw and University for Technology Warsaw, Poland, Cesvit Microelectronica srl, Italy, ZTH Zurich Switzerland). CETTI act as a satellite support center

PHARE RO 9602 TTQM: KNOW-HOW TRANSFER FOR POWER SUPPLY MODULES, joint project focused on Technological Transfer between an Italian Company (Shandy srl) specialized in UPS and a Romanian small size company (Rond Electric srl). CETTI supported the proper knowledge for electronic packaging.

Organized ISSE 2001 (International Seminar for Electronic) under IEEE-CPMT technical sponsorship, Proceedings ISBN 0-7803-7111-9, IEEE Catalog No 01 EX 492, Library of Congress No. 2001-090155

MECT (Ministry for Education Research and Youth) **Bilateral Research Program**, „Electromagnetic Electromecanic and Thermal Aspects in the Construction of Hybrid Electronics Subsystems,„ with Josef Stefan Institute Ljubljana and HIPOT company, Slovenia. Nr. 02/2005

MECT (Ministry for Education Research and Youth) **Bilateral Research Program**, „Modeling Simulation and Testing of Electronic Modules,„ with Budapest University for Technology and Economics, Budapest, Hungary. Nr. RO-12/2003

Organizing beginning with 1995, every year, the SIITME ((International Symposium for Design and Technology of Electronic Packages) (www.siitme.ro).