



Lifelong Learning Programme



COMMET

LEONARDO DA VINCI
Transfer of Innovation

CONFINDUSTRIA
Veneto **SIAV** S.P.A.

Lifelong Learning Programme 2007-2013 – Leonardo da Vinci

Transfer of innovation and new methods for identifying vocational competences within vocational education in the metal and electrical sector as illustrated by two vocations

Leonardo da Vinci Programme
Project no. DE/07/LLP-LdV/TOI/147036

CONFINDUSTRIA VENETO SIAV S.p.a

Berlin
December 8th, 2008

ISFOL Competence definition

Competence may be defined as the whole set of knowledge, skills and attitudes allowing the individual to achieve successful results in adaptation to relevant context and environment.

Competence is the ability to face and master problems through cognitive and social skills.

Competences are structurally able to transfer their value to different fields, thus dynamically generating knowledge and new competences.

Competences considered as strategic resources potentially developed by the individual are divided into three main areas:

- basic competences (i.e., basic IT knowledge, communication in a foreign language, economy, law and labour law);
- technical – professional competences (i.e., mastery of general and specialist declarative knowledge as well as a range of suitable procedures to apply);
- transversal competences (i.e. communication skills, analysis aptitude, decision making and problem solving).

Source: ISFOL, *Il punto su... certificazione delle competenze (The point about...competence certification)*, 2003

SIAV + ADAPT Competence definition



Profiles' group / guidelines are defined in strict relationship to **technical/professional competences** in order to:

- provide **flexible guidelines to design vocational training actions** and to secure the focus on core competences
- be a **reference for the Training Plan**

National contract categories 3th to 6th:

- **Incorporate ISFOL model (repository)**
- **incorporate transversal skills** – Vision: sector/ supply chain/ safety/ labour law/ innovation

National contract categories 5th to 6th:

- **K & S: autonomy/ responsibility/ results & improvement + technical C**

National contract category 7th:

- **underline and enhance management competences**

Identification of state of art

NATIONAL LEVEL

-**Profiles repository** based on competences, education and training - Institute for the Development of Vocational Training of Workers – **ISFOL** –
www.isfol.it/orientaonline

-**Profiles repository** based on competences – **FEDERMECCANICA** – Italian federation of Metal Working Industries – www.federmeccanica.it

REGIONAL LEVEL

-**Profiles repository** based on competences and qualifications – Region Emilia-Romagna

-**Table of reference** profiles within the main national qualification systems

On the field observation

-6 companies

-Analysis of key performances, styles, problem solving, expected tasks and results in relation ship with strategic/technical competences

Table of reference METAL CUTTING TECHNICIAN

Table A

“Metal Cutting Technician” – Reference profiles in the main qualification systems

| Qualification system/code | Category/code |
|--|---|
| <u>ISCO 88 classification</u> | 7212 Welders and flamecutters 7213 Sheet-metal workers 7222 Toolmakers and related workers 7223 Metal working machine tool setters and operators 7224 Metal polishers, wheel grinders and tool sharpeners |
| <u>ISTAT classification</u> | 6.2.1.2 Welders and flamecutters 6.2.1.3 Plumbers and coppersmiths, including trackers 6.2.1.4 Metal carpenters 6.2.1.7 Electrical and ASME standards welders |
| <u>Ministry of Labour's classification system and vocations code</u> | 621200 Welders and flamecutters |
| <u>EXCELSIOR information system</u> | 4.04.02 Welders, metal cutters and related workers 4.04.08 Metal polishers, grinders and tool sharpeners |
| <u>ISFOL Vocational repository</u> | Metal and mechanical sector - Manufacturing machinist - Welder |

Table of reference ELECTRO-MECHANICAL TECHNICIAN

Table B

“Mechatronic Technician” – Reference profiles in the main qualification systems

| Qualification system/classification | Code/category |
|--|---|
| <u>ISCO 88 classification</u> | 2143 Electrical engineers 3113 Electrical engineering technicians 7137 Building and related electricians 7215 Riggers and cable splicers |
| <u>ISTAT classification</u> | 6.1.3.7 Building electricians and related workers 6.2.4.1 Installers and maintainers of electrical and electromechanical devices 6.2.4.2 Installers and maintainers of industry and gauge <u>electrical</u> devices |
| <u>Ministry of Labour's classification system and vocations code</u> | 3.1.2.3 <u>Electrotechnician</u> 3.1.2.4 <u>Electronical technicians</u> 624110 Electrician 613701 Plant electrician |
| <u>EXCELSIOR information system</u> | 4.11.02 Electricians and installers of electrical and wiring systems 1.01.06 <u>Mechanical and mining engineering technicians</u> |
| <u>ISFOL vocational repository</u> | Metal and <u>mechanical sector</u> - <u>Assembler-installer</u> - The tester |
| <u>OBNF national survey about training needs</u> | cod.54 System maintainers cod.75 Assemblers/Installers cod.83 Production operators and related workers · Electrical-electronic and automated systems designers |



Competences provided by Technical Secondary School (5 yrs. - national) and Vocational Training Centres (3yrs. – regional)

TRANSVERSAL COMPETENCES AND SOFT SKILLS NECESSARY TO ACCESS THE TWO VOCATION:

- data **analysis** and elaboration skills,
- ethic and **responsibility**,
- efficiency**,
- problem solving** and trouble shooting,
- teamworking** and ability to work autonomously,
- ability to **plan**,
- interest and confidence in **ICT**.

Electro-mechanical vocation: important to understand and assess the ongoing dynamics in the **sectoral/ entrepreneurial** production **context**, synthesis skills, effective **communication**.

The linguistic competences are normally limited to English (technical handbooks)

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Work package III

Qualification grid for the vocation **Electro-Mechanical Technician**

| | |
|----------------------|---------------------------|
| Sphere of activity 1 | Assembling prearrangement |
| Sphere of activity 2 | Components assembling |
| Sphere of activity 3 | Electrical wiring |
| Sphere of activity 4 | Proof testing |
| Sphere of activity 5 | Safety and quality |

| Sphere of activity 1 | | | | |
|---------------------------------|---|---|--|---|
| Assembling prearrangement | | | | |
| Competence Dimension | | | | |
| Phases of the complete activity | Specialist Knowledge | Methodological competence | Social competence | Personal competence |
| Analysing | Able to analyse technical drawing and schemes; Able to understand CAM programme outputs | Able to gather information; Able to connect and elaborate information | Able to express critiques and contribute to constructive analysis with supervisor(s); Able to analyse the feasibility of a workpiece proposed in the technical drawing | Able to gather information; Able to use information |
| Planning | Able to plan a feasibility and quality study; Able to forecast internal blanking and welding for control cubicles manufacturing | Able to manage and participate to a feasibility study both by computer -based means as well as paper-based creative means (es. collage) | Able to discuss solution proposed by project designers; Able to develop willingness to communicate; Able to co-operate; Able to contribute to specialist practice | Able to foresee outputs; Able to identify problems; Able to handle problems on a cooperative basis; Able to develop solution(s) |
| Performance | Able to assembly and prearrange a chassis/cubide; Able to perform welding, metal cutting and punching on control cubicles; Able to use transport means (hoist, forklift truck, transpallet) | Able to apply the machine programme procedures; Able to comply with internal procedures; Able to comply with safety rules; | Able to agree solution proposed by project designers; | Able to focus on details; Able to apply basic IT skills; Able to develop further interest in ITC |
| Checking | Able to monitor optimal solution implementation | Able to contribute to standard procedures | Able to communicate results | Able to comply monitoring procedures; Able to identify the optimal solution |

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Work package III

Qualification grid for the vocation **Metal Cutting Technician**

| | |
|----------------------|--|
| Sphere of activity 1 | Machine programming |
| Sphere of activity 2 | Machine setting and cutting |
| Sphere of activity 3 | Metal foil positioning and burrs removing |
| Sphere of activity 4 | Transport and warehousing |
| Sphere of activity 5 | Machine maintenance and malfunction handling |

| <u>Sphere of activity 1</u> | <u>Machine programming</u> | | | |
|--|---|---|---|--|
| | <u>Competence Dimension</u> | | | |
| <u>Phases of the complete activity</u> | <u>Specialist Knowledge</u> | <u>Methodological competence</u> | <u>Social competence</u> | <u>Personal competence</u> |
| <u>Analysing</u> | Able to analyse technical drawing; Able to understand CAM programme outputs | Able to gather information; Able to connect and elaborate information | Able to express critiques and contribute to constructive analysis with supervisor(s); Able to analyse the feasibility of a <u>workpiece</u> proposed in the technical drawing | Able to gather information; Able to use information |
| <u>Planning</u> | Able to foresee the standard <u>workpiece</u> manufacturing; Able to foresee non-standard featured <u>workpiece</u> manufacturing | Able to plan the standard <u>workpiece</u> manufacturing; Able to plan non-standard featured <u>workpiece</u> manufacturing | Able to discuss solution proposed by project designers; Able to develop willingness to communicate; Able to co-operate; Able to contribute to specialist practice | Able to identify problems; Able to handle problems on a cooperative basis |
| <u>Performance</u> | Able to transfer technical/CAM drawings into DXF programming | Able to apply the machine programme procedures; Able to comply with internal procedures | Able to agree solution(s) proposed by project designers; Able to communicate | Able to apply basic IT skills; Able to develop further interest in ITC; Able to observe and assess the machine programming |
| <u>Checking</u> | Able to monitor optimal solution implementation (less burrs/scraps/waste, less time= more efficiency) | Able to contribute to standard procedures | <u>Able to communicate results</u> | Able to comply monitoring procedures; Able to identify the optimal solution(s) |





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This project has been funded with support from the European Commission. This communication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

