

# EUROPASS DIPLOMA SUPPLEMENT

## TITLE OF THE DIPLOMA (ES)

*Técnico Superior en Diseño en Fabricación Mecánica*

## TRANSLATED TITLE OF THE DIPLOMA (EN)<sup>(1)</sup>

*Higher Technician in Mechanical Manufacture Design*

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(1) This translation has no legal status.

## DIPLOMA DESCRIPTION

**The holder of this diploma will have acquired the General Competence with regard to:**

Designing mechanically manufactured products, sheet-metal processing tools, moulds and patterns for polymers, casting, forging, stamping or powder metallurgy, ensuring quality, and complying with labour risk prevention and environmental protection regulations.

**Within this framework, the PROFESSIONAL MODULES and their respective LEARNING OUTCOMES acquired by the holder are listed below:**

### “Graphical Representation in Mechanical Manufacture”

The holder:

- Designs mechanically manufactured products applying graphical representation rules.
- Establishes the characteristics of mechanically manufactured products, interpreting technical specifications according to regulations.
- Represents pneumatic, hydraulic and electric systems, applying representation rules and specifying the basic information of equipment and elements.
- Prepares graphical documentation for the manufacture of mechanical products using computer-aided design applications.

### “Mechanical Products Designs”

The holder:

- Selects elements, tools and mechanisms used in mechanical systems and manufacturing processes, analysing their functionality and behaviour.
- Designs construction solutions of components and tools for mechanical manufacture relating the required specifications with the necessary means for their manufacture.
- Selects materials for the manufacture of products relating their characteristics with the functional, technical, economic and physical requirements of the designed products.
- Calculates components dimensions of the defined elements, tools and mechanisms analysing their requirements.
- Assesses the design quality of elements, tools and mechanisms analysing their functionality and manufacture feasibility.

### “Sheet Metal Processing and Stamping Tools Design”

The holder:

- Selects sheet-metal processing or stamping tools, analysing the cutting and shaping processes.
- Designs construction solutions of sheet-metal processing and stamping tools relating the function of the piece to be obtained with the cutting and shaping processes.
- Selects materials for the manufacture of sheet-metal processing and stamping tools, relating their characteristics with the functional, technical, economic requirements of the designed products.
- Calculates the dimensions of the tool components analysing the requirements of the process and the part to be obtained.
- Assesses the design quality of sheet-metal processing and stamping tools analysing their functionality and manufacture feasibility.

### “Forging Moulds and Patterns Design”

The holder:

- Selects forging moulds and patterns analysing the development of the processes.
- Designs constructive solutions of forging moulds and patterns, analysing the moulding process.
- Selects materials for the manufacture of moulds and patterns relating their characteristics with the functional, technical, economic requirements of the designed moulds and patterns.

- Calculates the dimensions of the moulds or patterns components analysing the requirements of the process and the part to be obtained.
- Assesses the design quality of forging moulds and patterns analysing their functionality and manufacture feasibility.

#### **“Moulds Designs for Polymeric Products”**

The holder:

- Selects moulds and patterns for the transformation of polymers, analysing the moulding processes.
- Designs constructive solutions of moulds and patterns relating production requirements with the used means for manufacture.
- Selects materials for the manufacture of moulds and patterns relating their characteristics with the functional, technical, economic and physical requirements of the designed products.
- Calculates the dimensions of the moulds or patterns components analysing the requirements of the process and the piece to be obtained.
- Assesses the design quality of moulds analysing their functionality and manufacture feasibility.

#### **“Manufacturing Automation”**

The holder:

- Establishes the working cycle of the used automatic machinery and equipment interpreting technical specifications and the work process.
- Selects the power elements that must be used in process automation, analysing the requirements of the system.
- Determines position and types of information gathering that must be used in the process automation, analysing the characteristics of the catcher and the function carried out.
- Designs control schemes of automated facilities selecting the technology adapted to the process to be automated.
- Represents power schemes and the automated systems control, interpreting the established regulations.

#### **“Mechanical Manufacture Techniques”**

The holder:

- Applies operational techniques used in processes of stock removal interpreting their characteristics and limitations.
- Applies operational techniques used in special machining processes interpreting their characteristics and limitations.
- Applies operational techniques used in cutting and shaping processes interpreting their characteristics and limitations.
- Identifies the characteristics and limitations of the forging and moulding processes analysing the procedures to carry them out.
- Applies operational techniques used in welding procedures interpreting their characteristics and limitations.
- Applies fitting techniques analysing the characteristics and limitations of the procedures used to carry them out.

#### **“Project on Mechanical Products Design”**

The holder:

- Identifies the needs of the production sector, relating them with the standard projects that may satisfy them.
- Designs projects related to the competences described in the diploma, including and developing their constituting stages.
- Plans the project implementation, determining the intervention plan and associated documentation.
- Defines the procedures for the monitoring and control of the project implementation, justifying the selection of variables and instruments used.

#### **“Professional Training and Guidance”**

The holder:

- Selects job opportunities, identifying the different possibilities of labour integration, and the alternatives of lifelong learning.
- Applies teamwork strategies, assessing their effectiveness and efficiency on the achievement of the company's goals.
- Exercises rights and complies with the duties derived from labour relationships, recognising them in the different job contracts.
- Determines the protective action of the Spanish Health Service in view of the different eventualities covered, identifying the different types of assistance.
- Assesses risks derived from his/her activity, analysing job conditions and risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan in a small enterprise, identifying the responsibilities of all agents involved.
- Applies protection and prevention measures, analysing risk situations in the labour setting of the Higher Technician in Mechanical Manufacture Design.

### “Business and Entrepreneurial Initiative”

The holder:

- Recognises skills related to entrepreneurial initiative, analysing the requirements derived from job positions and business activities.
- Defines the opportunity of creating a small enterprise, assessing the impact on the performance setting and incorporating ethic values.
- Carries out the activities for the setting-up and implementation of a company, choosing the legal structure and identifying the associated legal obligations.
- Carries out basic administrative and financial management activities of an SME, identifying the main accounting and tax obligations and filling in documentation.

### “On the Job training”

The holder:

- Identifies the company's structure and organization relating them to the production and marketing of the manufactured products.
- Applies labour and ethic habits in his/her professional activity according to the characteristics of the job position and the procedures established by the company.
- Prepares plans for the manufacture of products applying graphical representation rules and applying CAD techniques.
- Develops mechanically manufactured elements or products from engineering specifications and established rules.
- Verifies that the development of the product complies with design specifications and established rules.

## RANGE OF OCCUPATIONS ACCESSIBLE TO THE HOLDER OF THE DIPLOMA

The Higher Technician in Mechanical Manufacture Design works in the industrial sector transforming metals, polymers, elastomers and compound materials related with the sub-sectors manufacturing mechanical equipment and machinery; electrical, electronic and optical material and equipment; and transport material within the industrial sector.

The most relevant occupations or jobs are the following:

- Design draughtsperson
- CAD technician
- Product development technician
- Forging die development technician
- Tool development technician
- Mould development technician
- Product and mould development technician

## AWARD, ACCREDITATION AND LEVEL OF THE DIPLOMA

**Name of the body awarding the diploma on behalf of the King of Spain:** Spanish Ministry of Education or the different Autonomous Communities according to their areas of competence. The title has academic and professional validity throughout Spain.

**Official duration of the education/ training leading to the diploma:** 2000 hours.

### Level of the diploma (national or international)

- NATIONAL: Non-University Higher Education
- INTERNATIONAL:
  - Level 5 of the International Standard Classification of Education (ISCED5).
  - Level 5 of the European Qualifications Framework (EQF5).

**Entry requirements:** Holding the Certificate in Post-Compulsory Secondary Education (Bachillerato) or holding the corresponding access test.

**Access to next level of education/training:** This diploma provides access to University studies.

**Legal basis.** Basic regulation according to which the diploma is established:

- Minimum teaching requirements established by the State: Royal Decree 1630/2009, of 30 October, according to which the diploma of Higher Technician in Mechanical Manufacture Design and its corresponding minimum education are established.

**Explanatory note:** This document is designed to provide additional information about the specified diploma and does not have any legal status in itself.

### COURSE STRUCTURE OF THE OFFICIALLY RECOGNISED DIPLOMA

PROFESSIONAL MODULES IN THE DIPLOMA ROYAL DECREE	CREDITS ECTS
<b>Graphical Representation in Mechanical Manufacture.</b>	9
<b>Mechanical Products Designs.</b>	18
<b>Sheet Metal Processing and Stamping Tools Design.</b>	18
<b>Forging Moulds and Patterns Design.</b>	8
<b>Moulds Designs for Polymeric Products.</b>	8
<b>Manufacture Automation.</b>	12
<b>Mechanical Manufacture Techniques.</b>	11
<b>Project on Mechanical Products Design.</b>	5
<b>Vocational Training and Guidance.</b>	5
<b>Business and Entrepreneurial Initiative.</b>	4
<b>On the Job Training.</b>	22
	TOTAL CREDITS
	<b>120</b>
OFFICIAL DURATION (HOURS)	<b>2000</b>

\* The minimum teaching requirements shown in the table above comprise 55% official credit points valid throughout Spain. The remaining 45% corresponds to each Autonomous Community and can be described in the **Annex I** of this supplement.

## INFORMATION ON THE EDUCATION SYSTEM

