



# Professional Profile Map of Plastic Mould Making

**Intellectual output IO1**

## Mould4Plast Project

KA2 – COOPERATION FOR INNOVATION AND THE EXCHANGE OF GOOD PRACTICES  
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## Professional Profile Map of Plastic Mould Making

### Work Area: Organisation & Construction

#### Task 1: Plan, define and organise the work process

##### Subtask 1.1 Plan, define and organise the work process

<b>Examples of activities</b>	1.1.1 assist in the selection of technological and process selection, understand the technological process
	1.1.2 suggest production and work procedures for complex moulds, set up CNC machines, debug and correct programmes, suggesting parameters
	1.1.3 independent work on advanced, complex moulds; create programs for CNC machines; set parameters for the injection process; team leadership

### Work Area: Organisation & Construction

#### Task 2: Read and use technical drawings

##### Subtask 2.1 Reading and interpreting the plan

<b>Examples of activities</b>	2.1.1 understand technical drawings; get an overview of technical information
	2.1.2 interpret technical information contemplated in the production plan
	2.1.3 analyse the specification of the mould and the plastic properties
	2.1.4 analyse the mouldability; analyse the plastic properties and the technical implementation

##### Subtask 2.2 Reading and editing of technical drawings

<b>Examples of activities</b>	2.2.1 understand/read technical drawings
	2.2.2 analyse technical drawings; understand and measure the product
	2.2.3 develop technical drawings

##### Subtask 2.3 Reading and creating of technical drawings

<b>Examples of activities</b>	2.3.1 read industrial drawings, work basically and redraw technical drawings
	2.3.2 create basic technical drawings, work with advanced industrial drawings, creates 3D models
	2.3.3 create technical drawings of medium advanced products
	2.3.4 complex creation of the construction documentation for advanced, complicated products
	2.3.5 optimize complex drawings using tools for simulation of injection
	2.3.6 training, supervision and expert advice for novice designers/constructors

## Work Area: Organisation & Construction

### Task 3: Develop and design moulds

#### Subtask 3.1 Developing mould designs

- Examples of activities**
- 3.1.1 assist in working with machines and in processing of the surface
  - 3.1.2. understand available materials and technological procedures
  - 3.1.3. design mould according to specification
  - 3.1.4. select materials and technological procedures
  - 3.1.5. prepare complex designs independently

#### Subtask 3.2 Reading and understanding the technical drawing and the technological procedures used for it

- Examples of activities**
- 3.2.1. evaluate mechanical properties of materials; assist in drawing; simple use of mechanical drawing software
  - 3.2.2. define mould materials; draw simple 3d models of advanced and complicated parts; redraw
  - 3.2.3. process the final material concept; develop full mechanical drawings (all types and 3d models, including complex models); edit and draw mechanical drawings; understand all aspects of mechanical drawing and the complexity of advanced drawings

#### Subtask 3.3 Designing moulds

- Examples of activities**
- 3.3.1. drawing under supervision
  - 3.3.2. interpret the technical specifications in order to create a draft plan
  - 3.3.3. analyse the specification of the mould and the plastic properties
  - 3.3.4. dimension the calculated mould (configuring) according to the characteristic, dimensions, disposition, cost of components, quality required; taking into account the limitations of the process, the means used and the subsequent use of the mould
  - 3.3.5. depict the automated operating process; drawings and sketches of manufacturing process
  - 3.3.6. control diagrams of the pneumatic, hydraulic, electro-pneumatic and eletro-hydraulic circuits

## Work area: Preparation & Specification

### Task 4: Specify materials to be used

#### Subtask 4.1 Specification of types and materials

Examples of activities	4.1.1. distinguish between the different ways of measuring the properties of the material (according to characteristics, temperatures, hardness, resistance, tolerable speed)
	4.1.2. specify different tools and machines to be used (manual and electrical)
	4.1.3. implement the different usage of tools and machines
	4.1.4. make decisions about materials to use in a mould
	4.1.5. measure safety and prevention for tools and machines
	4.1.6. understand risks of potential error; risk management by selection of materials for complicated areas and prevention of possible errors in the injection part

#### Subtask 4.2 Selection of material

Examples of activities	4.2.1. specification of material orders
	4.2.2. analyse proposed materials and their properties

#### Subtask 4.3 Acquisition of material

Examples of activities	4.3.1. assist in ordering materials
	4.3.2. evaluate and compare price offers, handle ordering software
	4.3.3. select and order specific materials

## Work area: Preparation & Specification

### Task 5: Program machines

#### Subtask 5.1 Programming and implementing of programmes

Examples of activities	5.1.1. assist in programming and starting the machine
	5.1.2. define the programming of the machine, tuning and adjustments
	5.1.3. start machines according to the type of machining, tool, working speed, effort and material
	5.1.4. polish steel with different techniques (milling, turning, soldering)
	5.1.5. numerical control of machine tools, robotics and computer vision

#### Subtask 5.2 Starting the machine

Examples of activities	5.2.1. understand tools and materials basically
	5.2.2. understand the technical and mathematical background
	5.2.3. understand machining parameters
	5.2.4. start complex production processes

<b>Subtask 5.3</b>	<b>Checking and controlling</b>
<b>Examples of activities</b>	5.3.1. support checking and controlling
	5.3.2. check and control the cooling systems, heating systems and hydraulic and electric systems; ability to take responsibility for the plugin system
	5.3.3. verify systems (experts with a license to work with electric circuits)

## Work area: Preparation & Specification

### Task 6: Prepare and test machines

<b>Subtask 6.1</b>	<b>Simulating the technological process</b>
<b>Examples of activities</b>	6.1.1. assistance in the simulation of the technological processes
	6.1.2. perform the simulation of the technological process independently

<b>Subtask 6.2</b>	<b>Evaluating the company's technological procedures and products in terms of manufacturability and feasibility</b>
<b>Examples of activities</b>	6.2.1. work with industrial drawings
	6.2.2. analyse data related to norms and standardised tests
	6.2.3. evaluate working process based on experience and knowledge
	6.2.4. specify materials required
	6.2.5. suggest changes to manufacturing processes
	6.2.6. suggest changes to company's products

<b>Subtask 6.3</b>	<b>Creating of software</b>
<b>Examples of activities</b>	6.3.1. support programming
	6.3.2. program the operational program of the CNC machines

<b>Subtask 6.4</b>	<b>Measuring data transfer</b>
<b>Examples of activities</b>	6.4.1. assist in assembling simple models and parts
	6.4.2. assemble complicated parts
	6.4.3. assemble complex models independently

## Work area: Preparation & Specification

### Task 7: Verify and modify processes

<b>Subtask 7.1</b>	<b>Pre-testing and failure verification</b>
<b>Examples of activities</b>	7.1.1. diagnose possible failures of a piece, a mould or a process
	7.1.2. verify possible failures, taking multiple factors in account

<b>Subtask 7.2</b>	<b>Disassembling</b>
<b>Examples of activities</b>	7.2.1. assist in disassembling
	7.2.2. identify failures, using tools (e.g. 3D models)
	7.2.3. disassemble selected parts to be changed

<b>Subtask 7.3</b>	<b>Repairing damage</b>
<b>Examples of activities</b>	7.3.1. assist in repairing damage in the welding procedure
	7.3.2. choose the correct welding technique, based on understanding of welding procedures
	7.3.3. repair damage independently
<b>Subtask 7.4</b>	<b>Polishing / finishing surface</b>
<b>Examples of activities</b>	7.4.1. assist in polishing and finishing of surfaces
	7.4.2. use the correct polishing method (past or sand paper) and the correct machine tools
	7.4.3. polish all types of moulds independently

## Work area: Manufacturing & Processing

### Task 8: Manufacture Mould

#### Subtask 8.1 Operating electroerosion machines

- Examples of activities**
- 8.1.1 operate electroerosion machines under supervision
  - 8.1.2. independent operation of electroerosion machines

#### Subtask 8.2 Producing moulds

- Examples of activities**
- 8.2.1. assist in working on machines and working with lathes
  - 8.2.2. work on machines, assist in metal surface processing; work with mills, lathes, rotaries, indexers
  - 8.2.3. produce complex moulds for plast; work autonomously with all types of machines, create and operate procedures on lathes and CNC mills
  - 8.2.4. adjust/modify the production process

#### Subtask 8.3 Surface treatment

- Examples of activities**
- 8.3.1. understand the possibilities and options in surface treatment
  - 8.3.2. use tools for polishing (hand and pneumatic welding tool); work under supervision with lathes, grinders, mills
  - 8.3.3. work with complex machines; analyse and develop solutions for occurring problems in production; communicate with designers

#### Subtask 8.4 Welding

- Examples of activities**
- 8.4.1. differentiate between welding methods
  - 8.4.2. use the right welding method with the right equipment, like resper, pneumatic welding tool and sand paper
  - 8.4.3. work with a welding licence
  - 8.4.4. supervision of welding activities

#### Subtask 8.5 Verify failure and pre-test

- Examples of activities**
- 8.5.1. detect possible failures of pieces, moulds and processes
  - 8.5.2. implement procedures to avoid possible failures; understand factors that may result in failures
  - 8.5.3. choose the right tool to verify parts of moulds

#### Subtask 8.6 Documenting manufacturing

- Examples of activities**
- 8.6.1. assist in documenting failures and failure verification
  - 8.6.2. document failures and failure verification; document conclusions obtained during the phases of design, of automation of the process and of manufacturing of the prototype

#### Subtask 8.7 Machining with non-cutting tools

- Examples of activities**
- 8.7.1. asisst in non-cutting machining
  - 8.7.2. use non-cutting machines

## Work area: Manufacturing & Processing

## Task 9: Maintenance of machines

### Subtask 9.1      Cleaning of machines

- Examples of activities**
- 9.1.1. understand cleaning methods
  - 9.1.2. use the correct chemicals or dry ice for cleaning
  - 9.1.3. use cleaning tools with ultrasound

### Subtask 9.2      Fitting and repairing of machines

- Examples of activities**
- 9.2.1. assist in techniques like rasper, grinding, wokring with berlin blue colour and paraffin
  - 9.2.2. use the grinding machine and the spotting press machine

### Subtask 9.3      Maintenance

- Examples of activities**
- 9.3.1. assist in observing the mould producing process
  - 9.3.2. mechanizing with automatic tools; interpreting technical challenges and possibly failures
  - 9.3.3. react to failures and difficulties and take a decision for remedy
  - 9.3.4. machinize critical areas; analyse problems; repair



## Work area: Quality & Safety

### Task 10: Safety

#### Subtask 10.1 Safety

Examples of activities 10.1.1. use working tools to check security of each working step

## Work area: Quality & Safety

### Task 11: Quality Assurance

#### Subtask 11.1 Verifying

Examples of activities 11.1.1. assist in verifying the process

11.1.2. facilitate the development of a harmonized system of measures and the necessary trails; set up the measuring tools needed for research and development of specific fields and to better define and control the quality of the products; carry out the exchange of scientific and technical information

11.1.3. analyse the injection defect, the functional aesthetic restyling, apply thickness optimization and functional prototyping

11.1.4. redesign the product under parameters such as weight optimization, resistance, cost, productivity and aesthetics

#### Subtask 11.2 Supervising

Examples of activities 11.2.1. read and understand technical drawings

11.2.2. analyse the process of injection in its stages and the different types of materials and tools that can be used

11.2.3. ensure the manufacturing process is in line with the planned specifications

#### Subtask 11.3 Controlling of material

Examples of activities 11.3.1. assist in input inspection of the quality of material

11.3.2. undertake input inspection of the quality of materials

11.3.3. compare the inspected quality with the specification of the mould maker

#### Subtask 11.4 Analysing the product designed by a constructor technically

Examples of activities 11.4.1. analyse the product and the material under supervision

11.4.2. analyse the product independently (parting lane, thermal balance, tempering, ejecting the mouldings from the mould, suggested materials analysis)

#### Subtask 11.5 Analysing the product and the production process economically

Examples of activities 11.5.1. draft reports

11.5.2. draft complex production reports

11.5.3. report independently and suggest materials and procedures

#### Subtask 11.6 Revising and quality control of mould

<b>Examples of activities</b>	11.6.1. assist to quality manager in administrative tasks
	11.6.2. assist in writing quality reports; support quality manager in assessment procedure
	11.6.3. measure, review and analyse complex mouldings independently

### Work area: Quality & Safety

#### Task 12: Documentation of data and work progress

<b>Subtask 12.1</b>	<b>Documentation of data and work process</b>
<b>Examples of activities</b>	12.1.1. prepare documents and reports (office based)
	12.1.2. assist in writing reports and documentation
	12.1.3. write reports and documentations