

**CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION**

**Name and address of awarding body:** Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai

**Name and contact details of individual dealing with the submission**

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**List of documents submitted in support of the Qualifications File:**

1. Qualification Document - Advanced Plastics Mould Manufacturing Assistant
2. Curriculum/ Syllabus
3. Training delivery Plan
4. Criteria for Assessment of Trainees
5. Occupational Map
6. Composition of core committee for QP Development order, DCPC, MoCF, GOI
7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members
8. Assessment Process flow
9. Documents supporting need of the Qualification:
  - a. Report of the Coordination Committee address the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India
  - b. A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
  - c. Brief report of Chemicals and petrochemicals Industry in India, April 2015, Corporate Catalyst India Pvt Ltd, Page 4
  - d. Report on Indian Plastics Industry 2013-17, edition 2, Nov 2014, PlastIndia Foundation.
  - e. Indian Plastics Industry – Vision 2012, Leverage Plastic, A report by CRISIL
  - f. Potential of Downstream Plastics Industry in North India, 26 June 2012, Knowledge and Strategy paper by Tata Strategic management Group & FICCI

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- g. Potential of plastics industry in Northern India with special focus on Plasticulture and Food Processing- 2014. A report on Plastic Industry by Tata Strategic management Group & FICCI.
- h. Plastic Industry in India a BPF Overview for PlastIndia International Exhibition 2012, New Delhi
- i. Porters Five force Analysis of the Plastics Industry by Santanu Mandal, International Journal of Multidisciplinary Research, Vol 1, Issue 7, November 2011, ISSN 2231 5780
- j. Industry Engagement certificate in preparation of learning outcomes and Job Role Identification in Petrochemicals sector

## QUALIFICATION FILE

### SUMMARY

**Qualification Title:** Advanced Plastics Mould Manufacturing Assistant

**Nature and Purpose of the qualification:**

A CIPET trade certificate for Advanced Plastics Mould Manufacturing Assistant and the main purpose of the Qualification is to get acquainted with the Mould Manufacturing process and get opportunity to work in this industry.

**Body/bodies which will award the qualification:**

The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.

**Body which will accredit providers to offer courses leading to the qualification:**

The Academic Cell – HO, Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Head Office, Guindy, Chennai.

**Body/bodies which will be responsible for assessment:**

The assessment is being carried out at individual Centre level. Training Assessment Wing is created in Head Office (HO) of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Guindy, Chennai is responsible for overall assessment.

**Occupation(s) to which the qualification gives access:** Assistant in Advanced Plastics Mould Manufacturing Process.

**Proposed level of the qualification in the NSQF:** Level 3

**Anticipated volume of training/learning required to complete the qualification:**

480 Notional hours.

**Entry requirements / recommendations:** Minimum qualification – Preferably 10<sup>th</sup> Standard, Minimum age - 18 years completed.

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### Progression from the qualification:

Advanced Plastics Mould Manufacturing Assistant (Level -3) has a clear pathway to Advanced Plastics Mould Manufacturer (Level – 4).

### Planned arrangements for the Recognition of Prior learning (RPL):

RPL arrangements are being developed and will be informed in due course of time.

### International comparability where known:

It will be carried out in next phase as comparability is being verified.

**Date of planned review of Qualification:** 04.08.2017

### Format Structure of the Qualification:

Title and Identification code of component	Mandatory/ Optional	Estimated Size (Notional Hours)	Level
1. CPC/ N 5801: To maintain a safe and Healthy work environment at Workplace	M	30	3
2. CPC/N 5802: To understand basic concepts of Engineering drawing & Can able to study the Job Drawing/ Blue Print & Dimensional Tolerances job	M	80	3
3. CPC/N 5803: Assist in performing the Mould making Process by use of different types of Hand tools	M	60	3
4. CPC/N 5804: Study of Types of Plastics Mould	M	120	3
5. CPC/N 5805:Machining Practice on Conventional & CNC Machines	M	40	3
6. CPC/N 5806: To Study about mould polishing & mould assembly	M	120	3
7. CPC/N 5807: Work Effectively in a Team	M	30	3
<b>Total</b>		<b>480</b>	
Qualification Pack - Advance Plastics Mould Manufacturing Assistant attached as Annexure			

## QUALIFICATION FILE

### SECTION 1

#### ASSESSMENT

##### **Body/Bodies which will carry out assessment:**

A Separate department/ body -Training Assessment Wing of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. Of India, Head Office, Guindy, Chennai.

##### **Will the assessment body be responsible for RPL assessment?**

RPL arrangements are being developed and will be informed in due course of time.

##### **Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:**

With uniformity and setting of learning outcomes for different Jobs Roles the assessment of candidates will be at learning outcome level. Assessment criterion has been defined for each learning outcome and it includes both theoretical and practical skills on which the candidate will be assessed. The question suite which will be used to check the skills of the trainee would include

- **Theoretical test suite** – Will include multiple choice questions, audio-video question etc. which will test the trainee on his knowledge of the subject
- **Practical Knowledge suite** – Practical knowledge can be tested through Assessor driven evaluation/test, Situational Judgment Tests etc to test practical core competence. A mix of these would be able to evaluate the trainee on his practical knowledge of the Qualification Document.

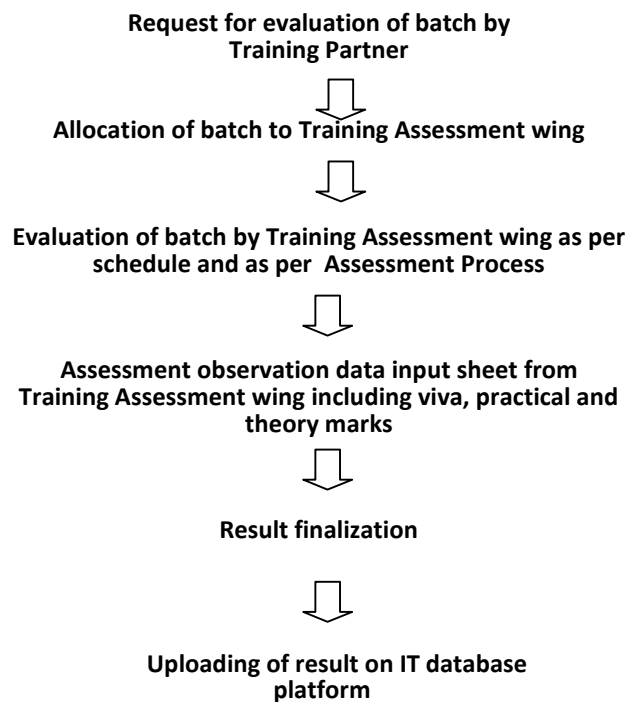
##### **Assessment strategy:**

- Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills.
- The Training Assessment Wing will have assessors who will not be associated with training activities and will be provided training on the said work. Thus it will ensure that the assessment carried out is fair and consistent.
- Set of question bank developed to assess the theoretical and practical knowledge. To ensure the quality, each trainees get the unique set of question
- Student has to score minimum marks separately for theoretical and practical skill and overall percentage should also be 50% for theory and 70% for practical.
- Empanelment of subject matter expert as assessor to assess trainee specifically on practical skills
- Assessments are preferably conducted by written examination papers in English/ regional languages according to the requirement.

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- It has been ensure that TP/trainer should not be present during assessment

### Assessment Process Flow:



### Summative Assessment:

Based on the Total Marks allotted for the specific subject, formal evaluation shall be conducted. Based on secured marks, candidates shall be declared pass or fail.

**Evidence Collected during Assessment:** Theoretical Answer Sheets, Practical Exam Sheets, Evaluation Sheets, Jobs produced during practical Exams.

### Protocol for Selection of Assessors:

- The Assessors should have the minimum qualification: Degree in Engineering.
- The Assessors should have minimum 5 years of Experience in the relevant field.

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### ASSESSMENT EVIDENCE

#### Assessment Guidelines:

1. Criteria for assessment for each Qualification Document will be created by CIPET.
2. Each Assessable outcome (AO) will be assigned marks proportional to its importance in Learning Outcome and few performance criteria may be allotted marks in combine.
3. Each Learning Outcome will be assessed both for theoretical knowledge and practical which is being proportionately demonstrated in the table below.
4. The assessment for the theory part will be based on knowledge bank of questions created by CIPET which will contain multiple choice theory questions and Practical question database with mark allotment criteria.
5. To pass the Qualification Document, every trainee should score a minimum of 50 % in Functional and all Generic Learning Outcome's.
6. In case of successfully passing only certain number of Learning Outcome's, the trainee is eligible to take Subsequent assessment on the balance Learning Outcome's to pass the Qualification Document.

**Title of the Component:** Advanced Plastics Mould Manufacturing Assistant

Assessable Outcome		Assessment Criteria for the outcome		
LO	Assessable outcome Description	Theory	Practical	Total
<b>CPC/ N 5801: To maintain a safe and Healthy work environment at Workplace</b>	AO1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise etc.	3	7	10
	AO2. Identify areas in the plant which are potentially hazardous/ unhygienic in nature	3	7	10
	AO3. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine	3	7	10
	AO4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.	3	7	10
	AO5. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc.	3	7	10
	<b>Sub total</b>		<b>15</b>	<b>35</b>
<b>CPC/N 5802: To understand basic concepts of</b>	AO1. To interact with the head mould maker & understand the mould drawing	3	7	10
	AO2. To ensure availability of Tools and Raw	3	7	10

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<b>Engineering drawing &amp; Can able to study the Job Drawing/ Blue Print &amp; Dimensional Tolerances job</b>	materials for production in sufficient quantity as per production plan/operators instructions			
	AO3. Understand the Assembly Drawing & Detail Drawing of Mould / Mould Parts	3	7	10
	AO4.Understand the Tools Required for executing the required Mould Making Process and ensure that the same is available in shop floor	3	7	10
	AO5.Understand the Tools Required for executing the required Mould Making Process and ensure that the same is available in shop floor	3	7	10
	<b>Sub total</b>	<b>15</b>	<b>35</b>	<b>50</b>
<b>CPC/N 5803: Assist in performing the Mould making Process by use of different types of Hand tools</b>	AO1. Perform Handling & Using of Different Hand tools	3	7	10
	AO2. Hands on Skill & Accruing Practices on measurement of Mould Parts	3	7	10
	AO3.Select Different tools for particular job	3	7	10
	AO4. Perform to handle the vernier Caliper, Micrometer etc.	3	7	10
	AO5.Can able to set job on different types of vices.	3	7	10
	<b>Sub total</b>	<b>15</b>	<b>35</b>	<b>50</b>
<b>CPC/N 5804: Study of Types of Plastics Mould</b>	AO1.Study of Two Plate Injection Mould & Three Plate Injection Mould	3	15	20
	AO2.Study of Mould Feed System, Types of Gate	3	10	10
	AO3.Study of Different types of cooling System	3	10	10
	AO4.Study of Different ejection system of Mould.	3	10	10
	<b>Sub total</b>	<b>12</b>	<b>45</b>	<b>50</b>
<b>CPC/N 5805:Machining Practice on Conventional &amp; CNC Machines</b>	AO1.To Operate the Lathe Machine & to perform different operation	3	12	15
	AO2.To Operate CNC Lathe	3	14	20
	AO3.To Operate the Milling Machine & to perform different operation	3	10	15
	AO4.To operate CNC Milling machine to perform different operations	3	14	20
	AO5.To grind the Mould Plates & Inserts using Surface Grinding machine	3	10	15
	AO6.To Operate the Cylindrical Grinding & to perform different operation	3	10	15
	<b>Sub total</b>	<b>18</b>	<b>70</b>	<b>100</b>



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<b>CPC/N 5806: To Study about mould polishing &amp; mould assembly</b>	AO1.Polish the core and cavity	3	15	20
	AO2.Polish the mating parts of mould	3	10	10
	AO3.Identify the mould parts	3	10	10
	AO4.Assemble the mould independently	3	10	10
	<b>Sub total</b>	<b>12</b>	<b>45</b>	<b>50</b>
<b>CPC/N 5807: Work Effectively in a Team</b>	AO1.Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	2	7	10
	AO2.Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt	2	7	10
	AO3.Give information to others clearly, at a pace and in a manner that helps them to understand	3	7	10
	AO4.Display appropriate communication etiquette while working	3	7	10
	AO5.Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	3	7	10
	<b>Sub total</b>	<b>13</b>	<b>35</b>	<b>50</b>
	<b>Total</b>	<b>100</b>	<b>300</b>	<b>400</b>
<b>Means of Assessment 1:</b>				
The assessment comprise of :				
<ul style="list-style-type: none"> <li>• Theory</li> <li>• Viva-voce</li> <li>• Practical assessment</li> </ul>				
<b>Means of Assessment 2:</b>				
<b>Pass/Fail –</b>				
The Pass mark of theory written assessment is 50% and for viva and practical assessment is 70%.				
The candidate has to pass separately in Theory and Practical.				

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### SECTION 2

#### EVIDENCE OF LEVEL

Level of qualification: 3

Title /Name of Qualification/Component: Advanced Plastics Mould Manufacturing Assistant Level: 3			
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF Level descriptors	NSQF Level
Process	<p>The user/ individual on the job needs to know and understand how to:</p> <ol style="list-style-type: none"> <li>1. Can able to Read the Job Drawing/ Blue Print &amp; Dimensional Tolerances</li> <li>2. Can able to Handle different types of Hand Tools , Job setting devices, Can able to measure the jobs dimensions using Different measuring instruments like Venire Callipers, Micrometer, Dial Gauge, Surface Gauge etc</li> <li>3. Assembly of various type of mould with application Ex: Hand injection mould, Two plate Automatic mould - Direct Sprue injection - Single Impression - Multi Impression - Side Gated – Three Plate Moulds</li> <li>4. Type of polishing, different type of polish kit and their application</li> <li>5. Making mould part using Conventional &amp; CNC Machine</li> </ol>	<p>He should Supporting the mould maker in assembly and polishing the moulds.</p> <p>He should understanding of the mould parts, polishing kit, Assembly Techniques, Manufacturing of Mould Parts using Conventional &amp; CNC Machines, Basic reading, writing and communication skills, Hand tools and Safety</p>	3

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<b>Professional knowledge</b>	<p>The user/ individual on the job needs to know and understand how to:</p> <ol style="list-style-type: none"> <li>1. Type of Hand Tools and its uses</li> <li>2. Reading of mould assembly drawing and details drawing</li> <li>3. Able to understand different types of moulds and their functions</li> <li>4. Able to understand the polishing techniques and tools</li> </ol>	<p>The Assistant should understand the different materials used in mould manufacturing, tools for machining as well as various techniques related to mould manufacturing. He should know the quality standards for different operations in mould making.</p>	<p>3</p>
<b>Professional skill</b>	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>• Plan and organize the activities/ work allocated by mould maker and supervisor</li> <li>• Organize all the polishing kits and assembly tools so that sorting is easy on a day to day basis</li> <li>• Use practical knowledge for mould assemble</li> <li>• Matching of core and cavity</li> </ul>	<p>Advanced Plastics Mould Manufacturing assistant should recall general methods for mould making and required process knowledge in the manufacturing process. Thus he should demonstrate practical skill, routine and repetitive work in assisting to the mould manufacturer.</p>	<p>3</p>
<b>Core skill</b>	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>• Write basic level notes and observations</li> <li>• Draw basic level drawings and charts</li> <li>• Read documents and notes</li> <li>• Interpret the information given in the documents and</li> </ul>	<p>Advanced Plastics Mould Manufacturing assistant should be able to read warnings, instructions and other text material on product labels, materials etc with minimum required clarity, should have skill of basic arithmetic to do calculations to assist in the process of mould manufacturing and communication skill is required to communicate the issues in</p>	<p>3</p>

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	<p>notes</p> <ul style="list-style-type: none"> <li>• Read and interpret symbols given on equipment and work area.</li> <li>• Discuss task lists and job requirements with co-workers</li> <li>• Effectively communicate information to team members</li> </ul>	the mould, materials etc.	
<b>Responsibility</b>	The responsible for assembly and mould polishing of moulds & Manufacturing mould parts using Conventional & CNC Machines	Advanced Plastics Mould Manufacturing assistant is having some responsibility in his own assembly and polishing work, Manufacturing mould parts using Conventional & CNC Machines and he work under close supervision and received time to time instructions on his work.	3

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### SECTION 3

#### EVIDENCE OF NEED

##### **What evidence is there that the qualification is needed?**

Qualification document has been developed by suggestion and approval of Chemicals and Petrochemicals Core committee constituted by Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India which consists of senior leaders and experts from Plastics and Allied Industry, Associations etc and has been further substantiated by various study reports, Annual reports etc. A report on the Coordination Committee addresses the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India (page no. 4, Attached as Annexure 8).

##### **What is the estimated uptake of this qualification and what is the basis of this estimate?**

The Skill gap report states that, there will be 11.6 Lakhs additional manpower is required by 2023-24 is based on the Machinery & Sector growth and Technical Manpower. Refer: Name of the Report **“A report of the coordination committee to address the issues related with human resources/skilled manpower required of the industry”** (page no. 6, Attached as Annexure 9 (a)) (Copy of the Skill Gap Report is enclosed).

##### **What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?**

Mapping of Advanced Plastics Mould Manufacturing Assistant has been done with National Classification of Occupation 2004 to ensure the qualification does not duplicate, the qualification have being checked with qualification pack of other sectors like Capital Goods, Automotive etc and there is no duplicity observed in terms of contents, module/syllabus covered etc

The NSDC list of approved and under developed Qualification Packs was checked prior to stating the work to ensure no duplicity.

##### **What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?**

Qualification Document shall be revised every two years and the feedback from Industries/ Associations, Alumni will be collected and necessary revisions/updating in Qualification document will be carried out. The feedback received from the industry in term of employability, course coverage, placement factors etc will be checked and growth indicators will be identified and reviewed.

##### ANNEXURE:

7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members

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9. Documents supporting need of the qualification:
  - a. Report of the Coordination Committee address the issue related with Human Resources/ Skilled manpower requirement of Industry- Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, Govt. Of India
  - b. A Report on Human Resource and Skill requirement for the Chemicals and Pharmaceutical sector (2022) by NSDC.
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## QUALIFICATION FILE

### SECTION 4

#### EVIDENCE OF RECOGNITION AND PROGRESSION

**What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?**

Relevant information was collected from Industries and allied sector working in this area. The Plastics industries are recruiting people based on the qualification acquired. Maximum of the industries accept this as qualification for selection/short listing of the individual ***(Minutes of Meeting of Core committee is attached)***.

The skills acquired at level 3 for a particular duration makes it easy for the Individual to progress to the next level.

ANNEXURE:

7. Presentation of 2nd core group committee meeting along with Minutes of meeting approved by members.

#### **Vertical Pathway:**

The Occupational Map has been created & attached.

The Advanced Plastics Mould Manufacturing Assistant (Level -3) has a clear pathway to Advanced Plastics Mould Manufacturer (Level – 4).

#### **Horizontal Pathway:**

The individual can migrate within the Plastics Processing related industries.

Occupation Map – Vertical Pathway

