**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, Hajipur, Industrial Area, Vaishali, Bihar. 844102.

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

Dr. P.C. Padhi, Director& Head, CIPET Hajipur, Industrial Area, Vaishali, Bihar. 844102. Ph: +91-6224-277424,270085,273515.

E-mail address**:**cipetpatna@gmail.com, hajipur@cipet.gov.in

**SUMMARY**

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| **Qualification Title:** Pipe & Profile Extrusion - Machine Operator |
| **Nature and Purpose of the qualification:**A CIPET trade certificate for Pipe & Profile Extrusion - Machine Operator and the he individual at work sets up and operates the blow moulding machine to produce good quality products from Plastics materials. He is responsible for produce bottles, containers or others hollow objects from plastics resin by operating semi & fully automatic and advance blow Moulding machines, troubleshooting process problems and performing minor maintenance to ensure continued operation of the production line. They are also responsible for completing the output learn Good Manufacturing Practices. |
| **Body/bodies which will award the qualification:**Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body which will accredit providers to offer courses leading to the qualification:**Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body/bodies which will be responsible for assessment:**The assessment is being carried out at Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Occupation(s) to which the qualification gives access:**Pipe & Profile Extrusion - Machine Operator occupation in Plastics product manufacturing process. |
| **Proposed level of the qualification in the NSQF:**  |
| **Anticipated volume of training/learning required to complete the qualification:**720 Notional hours. |
| **Entry requirements / recommendations:**Minimum qualification – Preferably Min -Class X/ITI, Minimum age - 18 years completed. |
| **Progression from the qualification:**The Pipe & Profile Extrusion - Machine Operator has a clear pathway.  |
| **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:** 20.10.2017 |

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| **Format Structure of the Qualification:** |
| **Title and Identification code of component** | **Mandatory/ Optional** | **Estimated Size (Notional Hours)** | **Level** |
| 1. Basics Plastics Raw Material &

Extrusion Concept | M | 120 |  |
| 1. Health and safety practices

maintaining at workplace | M | 60 |  |
| 1. Plastics Compounding / Mixing
 | M | 60 |  |
| 1. Perform the HDPE /PVC Pipe

Extruder Machine Operation | M | 90 |  |
| 1. Perform the Plastic Film

Extruder Machine Operation | M | 150 |  |
| 1. To Carryout House Keeping
 | M | 120 |  |
| 1. Reporting & Documentation
 | M | 60 |  |
| 1. To Carry Out Quality Checks
 | M | 60 |  |
|  |  | 720 |  |

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| **Body/Bodies which will carry out assessment:**A Separate department/ body -Training Assessment Wing of Central Institute of PlasticsEngineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. Of India, Hajipur, Vaishali, Bihar 844102.**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 theQualification Document.**Assessment strategy:**1. Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills.
2. 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.
3. Set of question bank developed to assess the theoretical and practical knowledge. To

ensure the quality, each trainees get the unique set of question1. 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.
2. Empanelment of subject matter expert as assessor to assess trainee specifically on practical skills
3. Assessments are preferably conducted by written examination papers in English/

regional languages according to the requirement.1. It has been ensure that TP/trainer should not be present during assessment
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**Assessment Process Flow:**

**Request for evaluation of batch by**

**Training Partner**



**Allocation of batch to Training Assessment wing**



**Evaluation of batch by Training Assessment wing as per schedule and as per Assessment Process**



**Assessment observation data input sheet from Training Assessment wing including viva, practical and theory marks**



**Result finalization**



**Uploading of result on IT database platform**

**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.

Steps undertaken for summative assessment:

1. Based on Completion of Batch, Evaluation Schedule shall be prepared
2. Identified Assessor is nominated for Evaluation
3. Setting up of separate Question Paper for Theory & Practical Examination
4. Conduct of examination as per the schedule
5. Evaluation & Certification

**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.

**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:** Pipe & Profile Extrusion - Machine Operator

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| **Assessable outcome** | **Assessment criteria for the****outcome** |
| **LO** | **Assessable outcome Description** | **Theory** | **Practical** | **Total** |
| 1. Basics Plastics Raw Material & ExtrusionConcept
 | AO1. Understanding Types of Plastics used in Extrusion and Its PropertiesAO2. Selection Plastics Raw Materials based on the Items Produced.AO3. Storing and Handling of Raw Materials and House KeepingAO4. Types of Extruders Used in the Extrusion Process and their PartsAO5. Types of Dies Used for different Extruded Products.AO6. Haul Off Units 2 6 8AO7. Storing and Handling of Finished Products and House Keeping.AO8. Types of Additives, Master Batches AO9. Types of Mixing and Compounding AO10. Measurement of Additives and Materials andMaintaining Formulations.AO11. Storing, Handling of Raw Materials in Compounding Area and House KeepingAO12. Understanding Safety Equipments and Its Use. AO13. Do’s and Don’t in Area of Operation AO14. Safety Precaution Majors before Operations. | 36 | 84 | 120 |
|  | **Sub total** | 36 | 84 | 120 |
| 1. Health and safety practicesmaintaining at work place.
 | AO1. Identify activities which can cause potential injurythrough sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise etcAO2. Identify areas in the work places which are potentiallyhazardous/ unhygienic in natureAO3. Conduct regular checks with support of themaintenance team on machine health to identify potential hazards due to wear and tear of machineAO4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etcAO5. Inform the concerned authorities about machinebreakdowns, damages which can potentially harm man/ machine during operationsAO6. Create awareness amongst other by sharinginformation on the identified risksAO7. Support the Safety team and the supervisor in creating the risk mitigation planAO8. Follow the instructions given on the equipment manualdescribing the operating process of the equipmentAO9. Follow the Safety, Health and Environment related practices developed by the organizationAO10. Ensure relevant safety boards/ signs are placed on the shop floorAO11. Operate the machine using the recommendedPersonal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplaceAO12. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals,production waste, oil, solvents etc.AO13. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniquesAO14. Maintain high standards of personal hygiene at the work placeAO13. Ensure that the waste disposal is done in thedesignated area and manner as per organization SOP.AO16. Inform appropriately the medical officer/ HR in case ofself or an employee’s illness of contagious nature so that preventive actions can be planned for othersAO17. Immediate First Aid action to be taken in case of any fatal accident due to Fire, Electricity, Gas, Chemicals etcAO18. Immediate Action to be taken in case Fire, Gas, Chemicals etc | 24 | 56 | 80 |
|  | **Sub total** | 24 | 56 | 80 |
| 1. Plastics

Compounding /Mixing | AO1. Understanding Types of Chemicals, Additives and Colorants.AO2. Properties and Importance of Chemicals, Additives and Colorants and Pigments.AO3. Properties changes by adding Chemicals, additives and pigments in Plastics.AO4. Formulation laid down for different Products. AO5. Types of Blenders , Mixers and their Parts AO6. Preparation Batches as per the formulations. AO7. Loading and unloading of Batches. AO8. Temperature, Pressure and Speed involved in Blenders and Mixers.AO9. Importance of each and every Parameters. AO10. Precaution to be taken care during the batchpreparation.AO11. Storing of batches after preparation. AO12. Understanding Safety Equipments and Its Use. AO13. Do’s and Don’t in Area of Operation AO14. Safety Precaution Majors before Operations. | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| 4. Perform theHDPE /PVCPipe ExtruderMachineOperation | AO1. Types of HDPE / PVC Extruders. AO2. Extruder Parts and Their Functions.AO3. Pressure and Vacuum Sizing UnitsAO4. Types of Dies Used for different Extruded Pipes. AO5. Operations of Haul Off Units AO6. Dismantling and assembling Extruder Parts.AO7. Safety Precaution taken during assembling anddisassembling.AO8. Common Process Parameter like Temperature, Pressure and Speed and its controls.AO9. Effect of process parameters on Product Properties AO10. Trial Production and checking product stabilization.AO11. Actual Production and Parameter / Process Control. AO12. Quality Check and Continuous Production. AO13. Post production and storing. AO14. Common faults found and trouble shooting. AO15. Segregation of faulty product and action taken. AO16. Disposal of faulty products as per laid downprocedure.AO17. Understanding Safety Equipments and Its Use.AO18. Do’s and Don’t in Area of Operation AO19. Safety Precaution Majors before Operations. | 27 | 63 | 90 |
|  | Sub total | 27 | 63 | 90 |
| 5. Perform thePlastic FilmExtruder MachineOperation | AO1. Types of Film Extruders. AO2. Extruder Parts and Their Functions. AO3. Air Compressor Pressure Sizing Units AO4. Types of Dies Used for different Extruded Films.AO5. Operations of Haul Off UnitsAO6. Dismantling and assembling Extruder Parts. AO7. Safety Precaution taken during assembling anddisassembling.AO8. Common Process Parameter like Temperature, Pressureand Speed and its controls.AO9. Effect of process parameters on Product Properties AO1. Trial Production and checking product stabilization. AO2. Actual Production and Parameter / Process Control. AO3. Quality Check and Continuous Production.Postproduction and storing.AO14. Common faults found and trouble shooting. AO15. Segregation of faulty product and action taken. AO16. Disposal of faulty products as per laid downprocedure.AO17. Understanding Safety Equipments and Its Use. AO18. Do’s and Don’t in Area of Operation AO19. Safety Precaution Majors before Operations. | 45 | 105 | 150 |
|  | Sub total | 45 | 105 | 150 |
| 6. To CarryoutHouse Keeping. | AO1. Take an overlook of the Area under House Keeping. AO2. Put appropriate Signage immediately if oily substance / Water spills on the floor to avoid accidentAO3. If certain housekeeping activities require to beperformed by housekeeping staffs, the Inform them.AO4. If it has to be carried out by self then, Identify the material / equipment required for cleaning the areas.AO5. Plan the sequence for cleaning the area to avoid resoilingthe cleaned areas and surfaces.AO6. Display the appropriate signage for the work being conducted.AO7. Ensure that there is adequate ventilation for the work being carried out.AO8. Wear the personal protective equipment required forthe cleaning method and materials being used.AO9. With right cleaning process carry out cleaning activities without disturbing others.AO10. Report to the appropriate person if any difficulties incarrying out your work.AO11. Ensure that there is no oily substance / Water spill on the floor, If found the put the Signage immediately to avoidaccident.AO12. Follow workplace procedures to deal with anyaccidental damage caused during the cleaning process.AO13. Ensure that, on completion of the work, the area is left clean and dry and free from any leftover or scrap.AO14. Return the equipment, materials and personalprotective equipment that were used to the right places and check the inventory for the next cycle.AO15. Dispose the waste garnered from the activity in an appropriate manner.AO16. Maintain schedules and records for housekeeping duty. | 36 | 84 | 120 |
|  | Sub total | 36 | 84 | 120 |
| 7. CPC/N0325 :Reporting &Documentation | AO1. Report data/problems/incidents as per the laid down procedure in the prescribed format and registers.AO2. Report to the appropriate authority as laid down by the company procedure.AO3. Identify documentation to be completed relating to the job profile.AO4. Record details accurately in an appropriate format. AO5. Complete all documentation within stipulated time according to company procedure.AO6. Make sure documents are available to all appropriate authorities to inspectAO7. Respond to requests for information in an appropriate manner whilst following organizational procedures.AO8. Inform the appropriate authority of requests for information received. | 24 | 56 | 80 |
|  | Sub total | 24 | 56 | 80 |
| 8. CPC/N0326 :To Carry OutQuality Checks | AO1. Ensure that total range of checks as per the prescribed national and International standards on regular intervals throughout the shifts.AO2. Use appropriate measuring instruments, equipment,tools, accessories etc, as prescribed / requiredAO3. Identify non-conformities to quality assurancestandards.AO4. Identify potential causes of non-conformities to quality assurance standardsAO5. Identify impact on final product due to non conformanceto prescribed Standards.AO6. Evaluating the need for action to ensure that problems do not reoccur.AO7. Suggest corrective action to address problem. AO8. Review effectiveness of corrective action. AO9. Interpret the results of the quality check correctly AO10. Take up results of the findings with QC incharge/appropriate authority.AO11. Take up the results of the findings within stipulated timeAO12. Record of results of action taken. AO13. Record adjustments not covered by establishedprocedures for future reference.AO14. Review effectiveness of action taken. AO15. Follow reporting procedures where the cause ofdefect cannot be identified. | 24 | 56 | 80 |
|  | Sub Total | 24 | 56 | 80 |
|  | Total | 216 | 504 | 720 |
| **Means of assessment 1:**The assessment comprise of -Theory AssessmentViva vocePractical assessment |
| **Means of assessment 2:**Pass/Fail-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. |

**EVIDENCE OF LEVEL**

**Level of qualification**

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| **Title /Name of Qualification/Component:** Pipe & Profile Extrusion - Machine Operator**Level:**  |
| **NSQF Domain** | **Outcomes of the****Qualification/Component** | **How the job role****relates to the NSQF****Level descriptors** | **NSQF****Level** |
| **Process** | Pipe & Profile Extrusion - Machine Operator is expected to ensure housekeeping andsafety in the production area and selectthe correct die, etc he/she has to-Understanding the work order andthe process requirement from thesupervisorArranging the required rawmaterial and Dies for the processTo interact with the supervisor inorder to understand theproduction scheduleTo plan the day’s productionactivities based on the supervisor’sinstructionsTo collect material data sheet,machine instructions and workmanualsTo ensure availability ofconsumables and plasticsmaterials for production insufficient quantity as perproduction plan/supervisorinstructions.Clearly understanding the doesand don’ts of the manufacturingprocess as defined in SOPs/ WorkInstructions or defined bysupervisors.Check availability of the personalprotective equipment’s (PPE) likeGloves, Goggles etc.Ensure that the required materialis procured from the store beforestarting the processUnderstand the dies required forexecuting the required operationand ensure that the same isavailable for operation.If die is not available collect thesame from die storage areaAdd the raw material in themachine using material loader orby manual feeding.Ensure dies are clean if not cleanwith soft cotton cloth.Ensure cleaning of the area aroundthe apparatus for any oil, grease,combustible substances etc. so asto prevent any accidentEnsure availability of the coolantand working of valves to circulatethe coolant to cool and solidifyplasticUnderstand the raw material likeplastics granules, fillers, bondingadditives etc. required forexecuting the activityRefer the queries to supervisor ifthey cannot be resolved by theoperatorConfirm self - understanding to thesupervisor once the query isresolved so that all doubts &queries can be resolved before theactual process executionHe is responsible for checking theoperations of the equipmentFeeding the granules as perrequirementPerform visual inspection of theoutput productsAchieve productivity, quality andsafety standards as per company’snormsReport problems to supervisorHe will be responsible forInspecting the finished componentskeeping records of production anddefectsconducting minor repair/deflashingif any on output partswhich can be reworkedThe role holder will interact withmaintenance team and materialmanagement teamThe individual needs to ensuresorting, streamlining & organizing,storage and documentation,cleaning, standardization andsustenance across the plant andoffice premises of the organizationHe needs to understand MarketInformation ManagementClient Relation ManagementMarketing knowhow and strategyHe also needs to understand andpractice Entering, update andmaintain data in MS Officesystem/ Office open sourcesystem. | Pipe & Profile Extrusion - Machine Operator job requireslimited range ofactivities whichare familiar andpredictable likeavailability ofconsumables,safety PPE, rawmaterial used,basic machineparts and itsfunctions etc.He shouldunderstand theraw material likeplastics granules,fillers, bondingadditives etc.required forexecuting theactivity, Diesrequired, theirtypes etc. |  |
| **Professional****knowledge** | The user/individual on the job needs toknow and understand:raw material like plastics granules,fillers, bonding additives etc.required for executing the activityStoring and Handling of RawMaterials and House KeepingMachine Cleanliness and safetyrequirements for commencingCompounding Mixing & Blender.General Principle, processknowledge & working procedureof extrusion machine.Identification & troubleshootingthe various defects in productsproduced in extrusion machine. | Machine Operator- Plastics Extrusionshouldunderstand andknow factualknowledge aboutprocess, principleof plasticsextrusionTechnique and itsoperation, troubleshooting, Qualityand Inspectionetc. |  |
| **Professional****skill** | The user/individual on the job needs toknow and understand:General principles of plasticsextrusion and processknowledge, die loading and unloading procedure, parametersettings etc.Types of plastics likethermoplastics and the additives& grades to be used tonnage andcapacity of the machine beingoperated.Different types of tools andmachinery to process the plasticand trim the outputVarious types of cooling systemsand their properties.How to perform extrusionmachine safety checkHazards and safety aspectsinvolved in tape production andusage of relevant PPEsSafety procedures to be adoptedto complete die removal processDetect problems in day to daytasks:Support operator in usingspecific problem solvingtechniques and detailing out theproblemsDiscuss possible solution with thesupervisor for problem solving.The user/individual on the job needs toknow and understand how to:Plan and organize the work orderand jobs received from theinternal customers/ operator.Organize all process/ equipmentmanuals so that sorting outThe user/individual on the job needs toknow and understand how to:Follow instructions and work onareas of improvement identifiedComplete the assigned tasks withminimum supervisionComplete the job defined by theoperator within the timelines andquality.The user/individual on the jobneeds to know and understandhow to:Use common sense and makejudgments during day to daybasisUse basic reasoning skills toidentify and resolve basicproblemsUse intuition to detect anypotential problems which couldarise during operations.He needs to know aboutentrepreneurship associated withplastics extrusion, its conceptsetc.He needs to know aboutmarketing strategy involved forthe products manufactured,market availability etc | Pipe & Profile Extrusion - Machine Operator should recallgeneral principles of PlasticsExtrusionprocedure andprocessknowledge whichmay be repetitivetype of work inthe area allotted,Types of plasticslikethermoplasticsand the additives& grades to beused, Dies, Itstypes, applicationetc. Thus heshoulddemonstratepractical skill,routine andrepetitive inPlastics Extrusionapplication/process, he shouldalso understandquality conceptsand use in thearea of workallotted. |  |
| **Core skill** | The user/ individual on the job needs toknow and understand how to:How to be able to read warnings,instructions and other textmaterial on product labels,components etcHow to enter into the historycard details of the fault identifiedin the plastic productmanufactured read equipmentmanuals and process documentsto understand the equipmentand processes better.Read instructions especiallysafety instructions especiallysymbols while using theequipment in the plant area logs.The user/individual on the job needs toknow and understand how to:Discuss task lists, schedules, andwork-loads with coworkers/assistants andsupervisorsQuestion internal customers/Shop floor operatorappropriately in order tounderstand the nature of theproblem and make a diagLOisAvoid using jargon, slang or acronyms when communicatingwith a operator /fellowsubordinates etc. Unless it isrequired. | MachineOperator -Plastics Extrusionshould be ableto read /writewarnings,instructions andother textmaterial onproduct labels,components etcwith minimumrequired clarity,should have skillof basicarithmetic, likeraw materialweights additionsetc. |  |
| **Responsibility** | Pipe & Profile Extrusion - Machine Operator is responsible for his own job and self learning.He/she Set up basic as well asall critical process parameters, plasticsraw material handling and operatePlastics Extrusion Machine in order toproduce good quality products as perapproved specifications by supervisor.He may need to control/ check multiplemachines at a time. | Pipe & Profile Extrusion - Machine Operator is responsible forfor plastics rawmaterialhandling, mixing/ compounding(if required),performing theextrusionoperation toproduce PlasticsPipes / Films asper therequirements |  |

**EVIDENCE OF RECOGNITION AND PROGRESSION**

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| **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 approved by members.**Vertical Pathway:**The Occupational Map has been created & attached.The Pipe & Profile Extrusion - Machine Operator has a clear pathway **Horizontal Pathway:**The individual can migrate within the Plastics Processing related industries. |