Template No.
CEMILAC_FFGP_PCD_09

Process Control Document (PCD) for Sand/Investment/Gravity Die/Centrifugal Casting Components

Document No: <Document No>
Issue/Rev No: <Issue No>
Date: <Date of Issue>

<DESIGN AGENCY LOGO>	**Document No.**			
	Issue No./ Rev No. :	<00X>/	**Issue Date :**	<DD/MM/YYYY>
	Copy No. :	01 of N	**No. of Pages :**	< total no .of pages >
	Document Classification :	☐ Secret ☐ Restricted		☐ Confidential ☐ Unrestricted

Title:	**Project/System :**
Process Control Document (PCD) for Sand/Investment/Gravity Die/Centrifugal Casting Components	< Project/System Name>
	LRU/System Part No.
	<No.>
	Critical Level
	<A/B/C/D/E>

	Name & Designation	**Signature**
Prepared By	<Design Rep Name>, < Designation> <Agency Name>	
Reviewed By	<Project Leader Name>, <Designation> <Agency Name> <AWG/QA HOD Name>, <Designation> <Agency Name>	
Approved By	<Project Leader Name>, <Designation> <Design Agency> <Officer_Name>, <Designation> RCMA <Name>	

<Design Firm Name & Address>

Contents:

Note / Disclaimer:

(i) This Process Control Document template is applicable for Sand/investment/Gravity die/Centrifugal casting components

(ii) If any details under the above headings/contents is IPR of the company, then an Internal control document shall be prepared and authenticated for those details by the company and the Internal document reference shall be mentioned in this Process control document (PCD).

(iii) CEMILAC/RCMA has the authority to delete or add /seek any relevant details as part of this PCD as per requirement.

(iv) This Document contains information pertinent to <company> unauthorized copy is strictly prohibited Any error or discrepancy in the process control document shall be the responsibility of the development agency (company name)

1. SCOPE

This document covers the method of manufacturing and process for casting of part name part No.---------- and Drawing No. is ----------

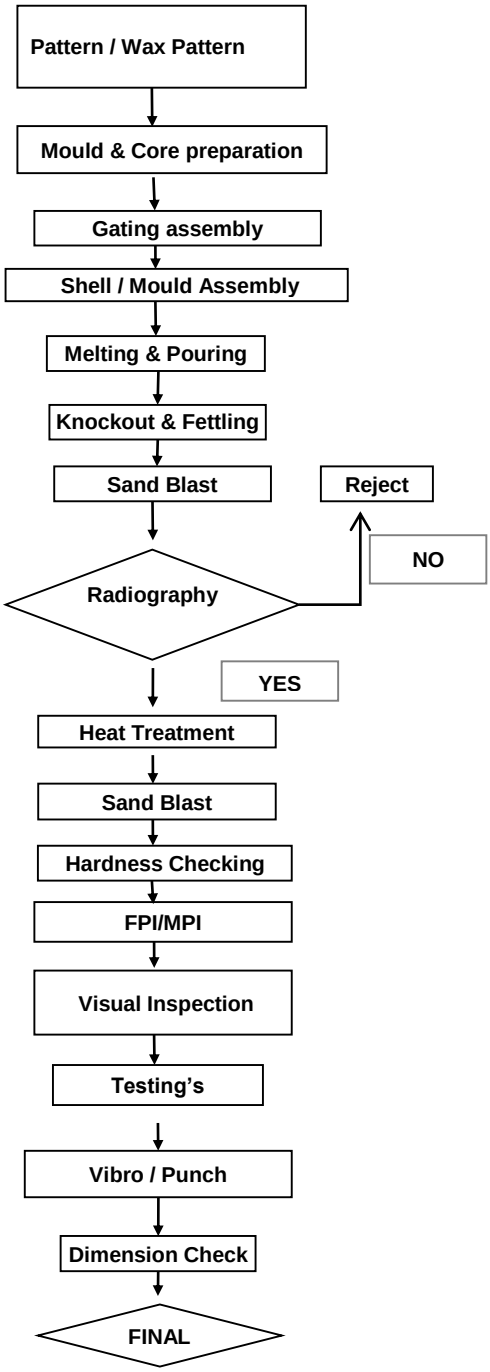
This document issued and controlled by----------.

2. PART DETAILS

PART PHOTO

Part name	
Drawing No.	
Customer part. No.	
Raw material stock (Ingot) specification	
Casting specification	
Overall dimension	
Supply condition	
Final heat treatment	
Project	
Manufacturing process	Sand/investment/Gravity die/Centrifugal casting

3. OVERVIEW OF CASTING PROCESS



4. PROJECT DESCRIPTION:

5. PART APPLICATION:

6. RAW MATERIAL

Specifications as specified in test schedule from the imported source list or Indian suppliers with LOA/ Provisional clearance / Type approval in compliance with IMTAR 21.

Ingot size:

Source:

Bill of materials:

7. PATTERN PREPARATION:

a) Material of Pattern
b) Pattern dimensions
c) Pattern allowance

8. SAND PREPARATION/WAX:

a. Type of sand/wax
b. Sand source

9. MOULD AND CORE PREPARATION:

a. Type of mould
b. Mould temperature
c. Mould hardness
d. Type of ramming
e. Binder preparation
f. Type of core
g. Material of core

10. GATING ASSEMBLY:

a) Details about runners and raisers with dimensions
b) Gating ratio
c) Details of Sprue
d) Flow rate
e) Schematic of gating system

11. SHELL MAKING: (FOR INVESTMENT CASTING):

a. Slurry & Stucco coating

b. Dewaxing after shell preparation

12. MELTING AND POURING:

a. Furnace details - Type of furnace used, calibration status, capacity

b. Melting temperature

c. Melting Rate

d. Pouring Temperature

e. Pouring time of molten metal in mould

f. Pouring rate

g. Flow velocity map

Process Summary:

13. SPECTRO ANALYSIS (CHEMICAL ANALYSIS)

a. Make

b. Calibration frequency

c. Standard used

14. KNOCK OUT AND CLEANING

15. FETTLING:

a. Cut the ingates, raisers & runners etc –

b. Fettling details

16. HEAT TREATMENT PROCESS

a. Heating Furnace: Electrical Resistance Furnace, Furnace calibration as per AMS 2750 and Class 4 furnace with ****C temperature tolerance.

b. Heat treatment cycle followed is as follows-

Full Batch + Cut part + Test bar

- Furnace details (type, tolerance, calibration)
- Type of heat treatment process – solutionizing, ageing details
- Temperature range
- Soaking time
- Type of cooling

- Quenching process details (quenching medium, quench delay, cooling rate and associated details)
- Oil temperature

Process Summary:

17. SAND BLASTING

Sand blasting is a method of resurfacing process used to clean, remove irregularities, strengthen (peen) or polish metal.

a. Type of blasting
b. Grit type
c. Grit Size
d. Operating Pressure
e. Surface finish

18. FINAL INSPECTION

19.PROCESS COMPLIANCE CHECK POINTS

PROCESS PARAMETERS	ACCEPTANCE CRITERIA
For ex: Pouring temperature	650-680 deg C
Mould material	
Heat treatment cycle	
Operating pressure	

20. PART IDENTIFICATION & PACKING

The part shall be identified in accordance with IMTAR 21 subpart C3.

The part shall be packed in such a way to prevent any damage or corrosion from occurring while handling, transportation, and storage. Each individual package of the part shall be provided with the outside marking ensuring traceability.

21. Bill of Material

SI NO.	RAW MATERIAL	SPECIFICATION	VENDOR

NOTE:

- **THIS DOCUMENT IS A GUIDANCE DOCUMENT. APPLICABLE SECTION/ TABLE ROWS MAY BE CONSIDERED. ANY ADDITIONAL DETAILS MAY BE ADDED. ANY NOT APPLICABLE SECTION/ TABLE ROWS MAY BE DELETED. THE TEMPLATE IS VERY GENERAL AND VARY WITH MATERIAL CLASS TO CLASS AND/OR GRADE TO GRADE, PROCESS TO PROCESS, DEVELOPMENT AGENCY PROCESS PLANT AND EQUIPMENTS. THE PROCESS CONTROL DOCUMENT MAY BE FINETUNED WITH THE TAA BEFORE LTCC BASED ON MATERIAL, APPLICATION AND EQUIPMENTS.**