Template No.
CEMILAC_FFGP_PCD_04

Process Control Document (PCD) for Non-Metallic Materials like Paints, Adhesives, Sealants, Composites

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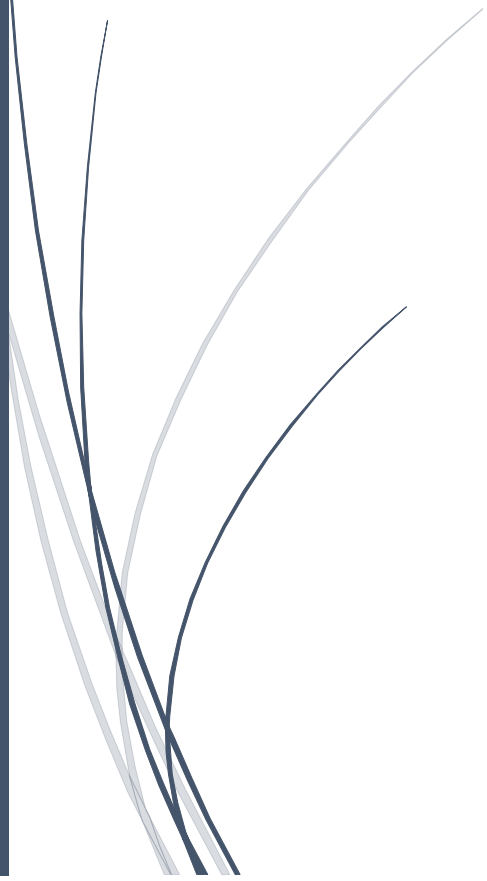

<DESIGN AGENCY LOGO>	**Document No.**			
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Title:	**Project/System :**
Process Control Document (PCD) for Non-Metallic Materials like Paints, Adhesives, Sealants, Composites	< Project/System Name>
	LRU/System Part No.
	<No.>
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	<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>

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Note / Disclaimer:

(i) This Process Control Document template is applicable for Non-metallic materials like paints, adhesives, sealants, composites, etc.

(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 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.

1.0 INTRODUCTION & SCOPE

1.1 INTRODUCTION:

Product Name:
Description of product
Design Agency/Firm:
Developing Agency/Firm:
Manufacturing Agency/Firm:
Specification
Project Description:
End use application
System applications / end use/Platform details

1.2 SCOPE:

This process document prescribes the raw material requirements, manufacturing process and Sampling, testing and storage requirements of the Product <Product Name>. This document specifies the requirements for controlling the process of manufacture of <product Name> to the conformance of the product to the governing specification requirements and maintenance of quality & product consistency.

2.0 RAW MATERIALS

2.1 RAW MATERIALS AND DETAILS OF CHEMICALS

S. No	Raw Material	Detailed description / Type / Purpose of the Raw material
1	RM1	Base Polymer / etc…
2	RM2	
3		
4		
5		
6		etc.…

2.2 DETAILS OF SOURCESOF RAW MATERIAL

The following details show the source for raw material.

S. No	Nomenclature	Manufacturers / OEM details	Supplier details
1			
2			
3			
4			

2.3 RAW MATERIAL SPECIFICATION

The Raw materials specification refers to the test report /certificate (or) Certificate of Conformance for raw materials attached as Annexure-1. (annexure-1 shall list the properties and specification limit values)

2.4 INWARDS INSPECTION& TESTING FOR RAWMATERIAL

(i) At inwardsinspection stage; the following details are checked for raw materials,

1) RM qty as per PO & expired date
2) Supplier test certificate for the intended properties / specification limits
3) Shelf life
4) Date of manufacturing
5) Packing
6) Preservation/storage

These are all recorded in Receiving inspection report <Document reference no. to be mentioned> and Stock register.

(ii) The following properties will be tested for the following raw materials as part of Inwards Inspection:

S. No	Raw Material	Properties
1	RM1	
2	RM2	
6		etc….

2.5 PROCESS OF APPROVING NEW RAW MATERIAL SOURCING

1) In case of getting materials from new raw materials source, all testing to be carried out as per the specification.
2) If the materials meet the specifications requirement, the material shall be used for fabrication of the parts in line with test schedule requirements as applicable.
3) If materials not meeting the requirements that material shall be rejected and removed to quality clinic.
4) The new source shall be considered for approval by RCMA ;once the material meets all-testing requirements as per the specification.

2.6 STORAGE OF RAW MATERIALS

After inwards inspection, the raw materials and chemicals shall be stored at Non–Metallic storage area. It should be free from moisture. The proper MSDS should be pasted at Non-Metallic area. And should ensure the knowledge of MSDS for all working employees.

Preferable Storage conditions (as per standard document ref No. _____):
Temperature range:
Max Relative Humidity:

Other preferable storage conditions:

The work Instruction for Preservation and storage of Raw Materials / Products (Document no. reference to be mentioned) to be followed.

3.0 FORMULATION

S.No.	RAW MATERIAL	WEIGHT PERCENT (%)
Total		

For rubber compounds:

S.No.	Raw Material	Qty
	Master batch	
	Final batch	
	Total	

Note: Formulation is given in the sequence of addition of raw materials.

4.0 MANUFACTURING PROCESS:

The Manufacturing process shall include the contents on following topics:

(i) Process flow diagram explaining the step-by-step process and document control

(ii) Sequence of addition of raw materials

(iii) Process parameters for each process stage/step as applicable
For example:
Temperature
Pressure
Flow rate
Stirring speed
Process time etc…. as applicable

(iv) In-process checks for each process stage/step as applicable

(v) Other details involving process control along with the internal control document reference as applicable.

Note: For example; a process flow diagram for rubber compound is represented below for your reference. Similar way it shall be given for any non-metallic material.

SAMPLE: PROCESS FLOW DIAGRAM FOR MANUFACTURING PROCESS (RUBBER COMPOUND)

I SEQUENCE OF MANUFACTURING PROCESS (Document reference)

1) Purchase of Raw materials & chemicals
RM & chemicals purchase as per recipe for making the<…….> rubber compound.

↓

2) Receiving inspection of RM &chemicals
AS per Aerospace inspection plan (<Document reference>)Parameters: RM Weight, TC/COC verification, MSD.

↓

3) Storage of RM & chemicals
Parameter: Store stock & FIFO register, Preservation and storage of raw materials/ products/rubber components- (Document reference)

↓

4) Weighing
As per material mixing record(Document reference)Weighing machine be used.

↓

5) Mixing
Rubber mixing mill used for this process. Mixing operation as per (Document reference)

↓

6) Testing
<…….> used to test the curing time and temperature of rubber compound.

↓

7) Moulding
Moulding process as per (Document reference no.). Test button and test slab to be produced for testing. Test button size per ASTM standard:OD-29 x Thickness – 12.5 mm & Test slab size as per ASTM standard: 170 x170 x 2.0 mm thickness.

↓

8) Trimming
Flashes to be removed manually.

↓

9) Testing
The test button and slab to be tested. Test button used for check thehardness by Shore A hardness tester. And Test slab is used for check the tensile strength and % elongation by Universal testing machine. The test result should be as per < Specification>. The results are recorded in lab test record (Document reference)

↓

10) Visual inspection
Test button and test slab should free from air bubbles, air lock, peel off, porous and distortions and it ensured with 10X magnification lens.

↓

11) Final testing
Test as per< Specification>.Test to be conducted at third party NABL Lab.

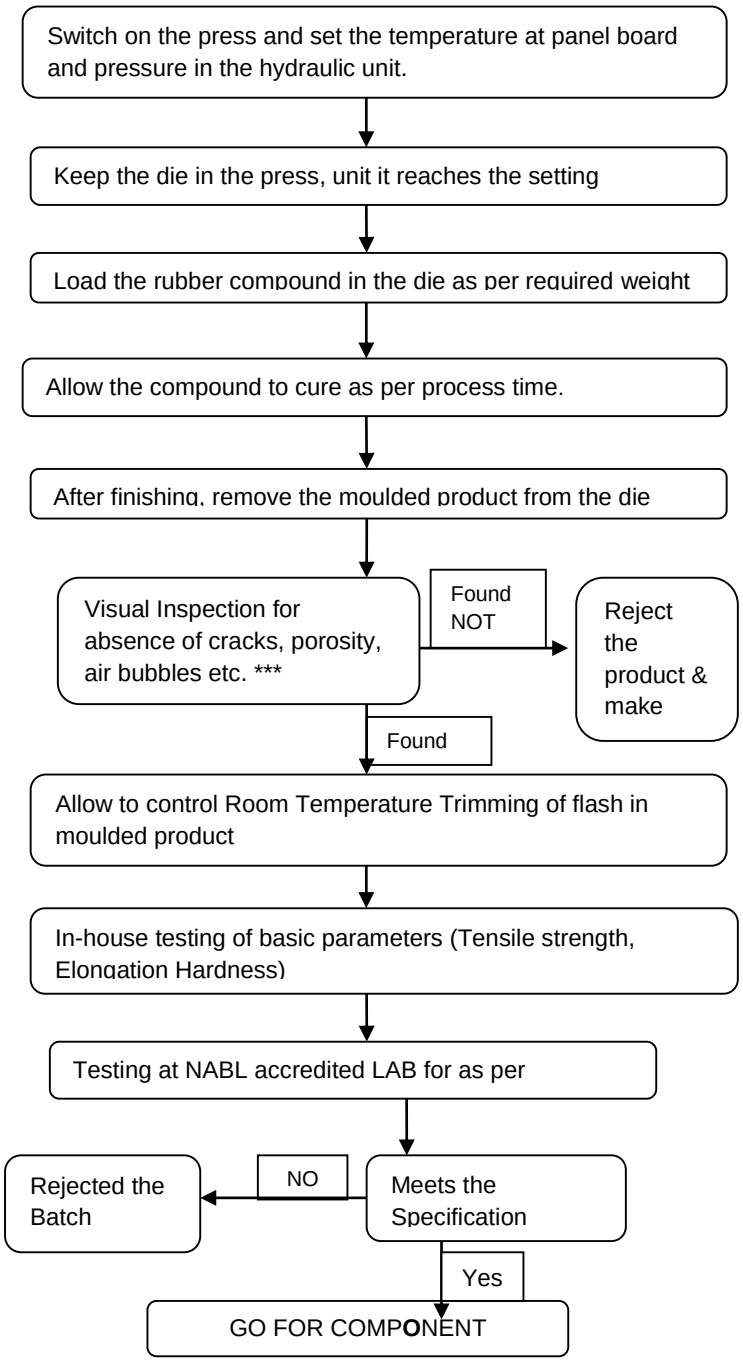
↓

12) Documentation and records submission for RCMA / CEMILAC.

COMPOUND MIXING	DOCUMENT CONTROL
Raw materials weighing as per the Mixing Log (Refer doc no.1) ⇓ Stage-1 Mixing: Mixing the raw material as per work instruction in the mixing mill to produce the master batch (Refer doc. No..) ⇓ After mixing allow to cool at room temperature. Then give the Identification Tag for each batch (Batch Number, processing date & Time, Next process stage) ⇓ Batch will be stored at Room temperature for 4 hours (Refer doc. no: …) ⇓ Stage-2 Mixing: Add the Accelerators for final mixing to produce the final compound(Refer doc. no: …) ⇓ After final mixing, keep the batch for at least<….>hours at room temperature ⇓ Finally, go for moulding. If excess rubber compound found then store it in a freezer (Refer doc. no: …)	1. PROCESS LOG SHEET (i.e. MIXING LOG SHEET) –…… 2.WORK INSTRUCTION (MIXING) –….. 3. In-Process Control: 4. In-Process Checks: 5. Inspection requirements:

Note: Additional stages if any for process control shall be brought out in this PCD.

III. MOULDING

MOULDING (TEST SLAB & BUTTON)	DOCUMENT CONTROL
	1.MOULDING LOG SHEET –…… 2. WORK INSTRUCTION (MIXING) –….. 3. In-Process Control: 4. In-Process Checks: 5. Inspection requirements:

5.0 DETAILS OF MANUFACTURING EQUIPMENTS AND TESTING INSTRUMENTS:

S.NO	MACHINE NAME	CAPACITY	MAKE/MODEL	IDENTIFICATION	CALIBRATION DETAILS
1					
2					
3					

6.0 SAMPLING PROCEDURE FOR FINAL TESTING OF PRODUCT:

Standard sampling procedure is to be brought out.

7.0FINAL TESTING OF PRODUCT AS PER SPECIFICATION……, ISSUE NO:00,YEAR:……

Three batches of the product shall be tested to the full specification requirements as per spec_____ / Qualification test schedule (QTS) Ref.___in NABL accredited Laboratory..

Before forwarding the samples to NABL Laboratory the following in house testing of basic parameters is carried out and ensured to meet the requirements as per specification / QTS.

i)Test 1
ii) Test 2
iii)Test 3 etc.

8.0DETAILS OF PACKING, STORAGE & SHELF LIFE

8.1 PACKING

The product shall be packed and supplied in suitable containers as agreed between the airborne user and manufacturer. Packing done by the manufacturer should not be removed till items are actually required for use.
<Suitable package details shall be included by the manufacturer>

- Container make:
- Container Sealing:
- Capacity / Quantity:
- Other relevant details:

8.2 IDENTIFICATION OF PACKING:

Every packaging/Envelope shall be marked with at least the following information whatever applicable shall be visible from outside of the package without breaking the seal.

1. Product Name
2. Net Content / Quantity
3. Specification No.
4. Batch No.
5. Date of Manufacturing
6. Date of Retesting
7. Total Shelf Life
8. Consignee Details
9. Order No.
10. Name and address of the manufacturer
11. Quarter and year of cure (applicable for rubber compound)
12. Life grouping/ Category (if applicable and known)

8.3 STORAGE, SHELF LIFE, MSDS, SERVICE LIFE:

(i) Storage:

- Temperature range:
- Max relative humidity:
- Other Storage conditions/stipulations to be followed by the User:

(ii) Shelf life:

The following life is applicable; if stored under conditions as stipulated by the manufacturer as mentioned in 8.3 (i) (with supporting documents)

- Initial Shelf life:
- Retest:
- Total Shelf life:

(iii) MSDS: MSDS shall be prepared and submitted to TAA and User

(iv) Service life: Note: Recommended Service life of the product in actual end use application to be mentioned by the manufacturer along with supporting technical documents

9.0 Certification

9.1 Issue of provisional clearance

Application by main contractor for provisional clearance along with Process compliance report (PCR) to process control document (PCD) & 3 batches test compliance report (TCR) to specification; both reports are to be duly witnessed and coordinated by DGAQA. Provisional clearance is valid for 2 years & may be extended for another 2 years if main contractor requests. Failing to convert to LOA (Letter of

Approval) within 4 years will lead to Revoking the provisional clearance as per procedure stipulated by CEMILAC.

9.2 Issue of LOA (Letter of Approval)

Application by main contractor for LOA (Letter of Approval) with Form 21G along with type record, performance feedback report of the product (or) component made out of the subject product (for rubber compound) duly signed by main contractor / user and the DGAQA / competent QA authorities and batch test reports. LOA is valid for 10 years.

10.0 Traceability

All the batches produced at <Company name & address> for Defence supplies shall be traceable and available for verification by relevant authorities as and when required.

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