

**PTFE Filter Destruction Project:
Screw Conveyor Purchase Specification**

This document is the property of NECSA and shall not be used, reproduced, transmitted or disclosed without prior written permission

**PTFE Filter Destruction Project:
Screw Conveyor Purchase Specification**

Document No.: ENS-MES-SPE-0055

Revision: 1

Document Approval:

	Name	Signature	Date
Prepared by:	MB Msane		
Reviewed by	S Mngoma		
Approved by	F Erasmus		
Approved by	Y Mandri		
Accepted by	M Hlongwane		

Distribution

1.	MB MSANE	
2.	S MNGOMA	
3.	F ERASMUS	
4.	Y MANDRI	
5.	M HLONGWANE	

The revision history of the document is available in the DocMan System

PTFE Filter Destruction Project: Screw Conveyor Purchase Specification

Table of Contents

List of Acronyms & Abbreviations	3
1 INTRODUCTION	4
2 Purpose	4
3 Scope of Supply	4
4 Mechanical Battery limits.....	5
5 General Requirements	5
6 Screw Conveyor	6
7 Qualification of bidder	7
8 Conveyor Factory Acceptance Test	7
Appendix A: Screw Conveyor (C81009) project specification sheets.....	8
Appendix B: Screw Conveyor P&ID	9

List of Acronyms & Abbreviations

The following acronyms and abbreviations are used in this document:

PTFE	Polytetrafluoroethylene
RFQ	Request for Quotation
Rpm	revolutions per minute
TBC	To Be Confirmed
CD	Compact Disc
atm	atmosphere
FAT	Factory Acceptance Test
SAT	Site Acceptance Test
P&ID	Piping & Instrumentation Diagram

1 INTRODUCTION

Necsa has a large quantity of PTFE candle filters (PCF's) taking up a very large volume on site. The large PTFE candle filter waste needs to be reduced through Plasma Gasification processes. The first step in the volume reduction process is the shredding or granulating of the filters followed by further processing. The shredded particles will be transported from the shredder by means of a screw conveyor into a feed-hopper for further downstream processing.

The screw conveyor (C81009) shall convey shredded PTFE candle filter particles smaller than 5 mm of different shapes with a heap density of 0.66 kg/L. The feed material may be moist. The screw conveyor (C81009) shall be mounted at an upward angle. The screw conveyor (C81009) shall be driven by an appropriate sized variable speed drive motor to feed shredded PTFE material into the feed hopper unit. The design will accommodate between 80 and 120 kg/h feed rate.

This purchase specification (this document) will be used together with tender documents, the screw conveyor conceptual drawing (ENS-MES-DWG-0004) and data sheets at procurement stage. A successful bidder will be required to design, fabricate, assemble, deliver (to Necsa in Pelindaba), and perform functional tests (FAT & SAT) of the equipment.

2 Purpose

The purpose of this purchase specification is to provide details of the requirements for a screw conveyor (C81009) to be supplied as an assembled unit for the PTFE Filter Destruction project.

3 Scope of Supply

The scope of work for the supplier includes the following:

1. To design, manufacture, supply and deliver a 4 inch internal diameter screw conveyor (C81009) assembly. The screw conveyor (C81009) must be flanged with a standard 4 inch class 150 flanges on the inlet and outlet in accordance with the attached conceptual drawings (ENS-MES-DWG-0004).
2. The supplier shall provide detailed general arrangement, fabrication, and assembly drawings of the screw conveyor (C81009) system for approval prior to manufacture.
3. The screw conveyor (C81009) shall come with VSD electrical motor as an assembly.
4. The supplier shall develop a supplier internal quality control plan for the fabrication and assembly of the equipment.
5. Source the materials of construction, fabricate and assemble the equipment in accordance with supplier design specifications and specification sheets provided in appendix A of this document.
6. Supplier shall provide critical spares for commissioning and operation, if applicable.
7. Test the assembled equipment in a factory i.e. a Factory Acceptance Test (FAT) shall be performed prior to delivering the equipment to purchaser's facility at Necsa in Pelindaba.
8. Test the assembled equipment on site i.e. a Site Acceptance Test (SAT) shall be performed after the delivery of assembled equipment at purchaser's facility at Necsa in Pelindaba.

4 Mechanical Battery Limits

The following are the mechanical battery limits for the screw conveyor:

- **Inlet connection point (tie-in):** The inlet flange connection between the bellow and screw conveyor, where material enters the screw conveyor. The supplier is responsible from inlet transition of the screw conveyor.
- **Discharge connection point (tie-in):** The discharge flange or spout where material exits. The supplier is responsible for end at the discharge connection point (tie-in) where material drops to the next process or storage unit, which is the valve or hopper.
- All other equipment on figure 1 is for illustration purposes and does not fall under the scope of the supplier, the supplier shall supply an end to end raised flanged screw conveyor.

5 General Requirements

The screw conveyor (C81009) will handle shredded feed material smaller than 5 mm from (outlet shredded material delivered by the shredder) in size with a heap density of 0.66 kg/L, fed at a nominal feed rate of between 80 and 120 kg/h. The conveyor shall be leak proof during operations. A sketch of a conveyor on figure 1 below, indicating high level dimensions of the equipment.

PTFE Filter Destruction Project: Screw Conveyor Purchase Specification

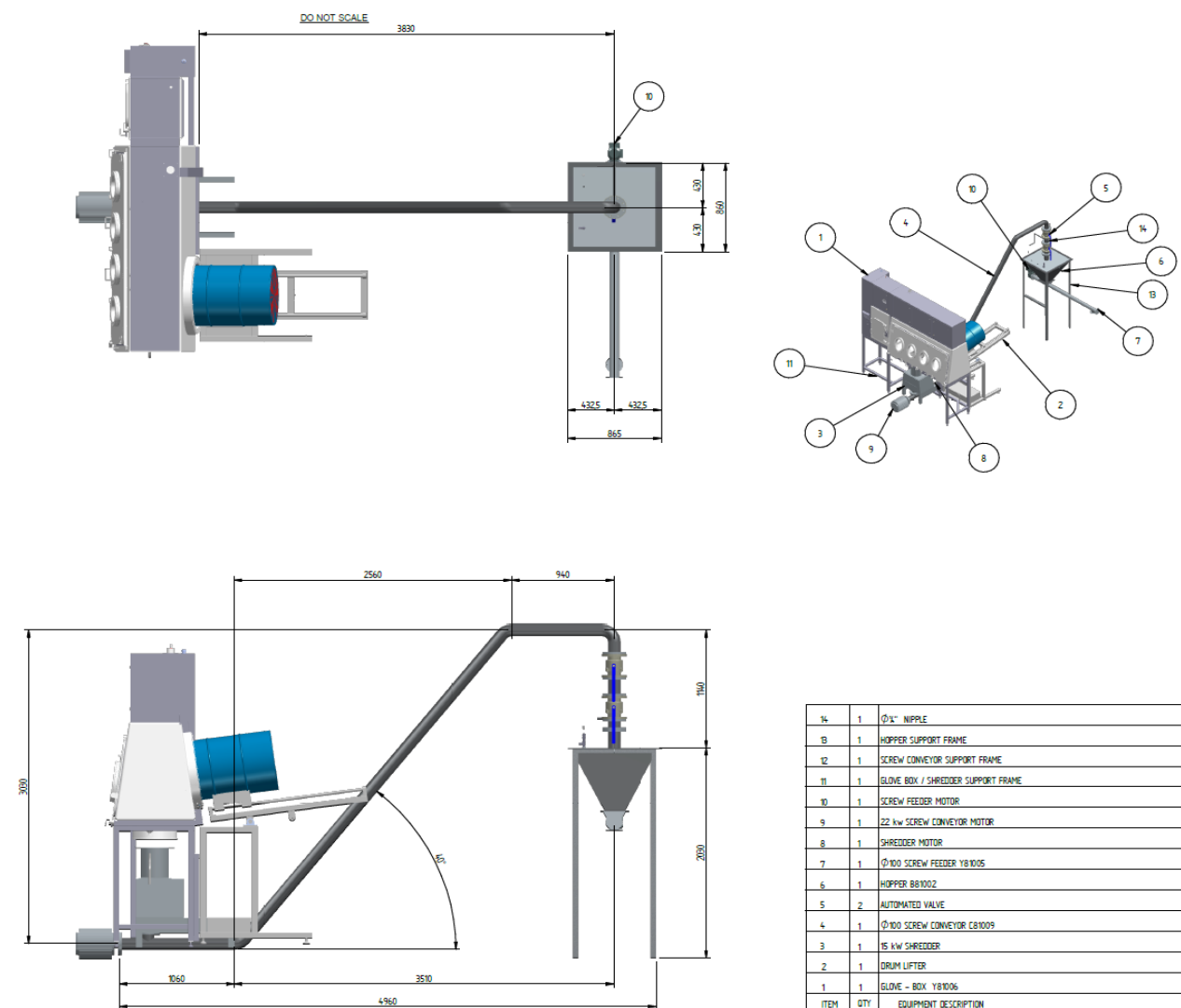


Figure 1 : Reactor system 2D sketch, item 4 is the screw conveyor (C81009) required for the design.

Note: The final dimensions of the conveyor (C81009) shall be determined by the supplier, but it is recommended by the client for the whole assembly to within the height of 1,91 m as per the figure 1 above.

6 Screw Conveyor

The screw conveyor (item 4, figure 1) will receive mixed shapes of shredded PTFE candle filter material of varying moisture content at varying particle size, and feed it into a feed-hopper through a 4 inch internal diameter pipe. The inlet and the outlet of the screw conveyor shall be flanged with a class 150, raised flange (RF) 4 inch nominal bore size. The conveyor (C81009) materials of construction shall be selected by the supplier, however the Necsa preferred material of construction is mild steel. The screw conveyor (C81009) will have a variable speed drive (VSD/VFD) varying between 100 and 300 rpm, and capable of feeding at a nominal feed rate of between 80 and 120 kg/h of PTFE candle filter waste material. The screw conveyor (C81009) will be driven by an estimated 22kW Electrical motor (supplier to finalise motor sizing), preferable a small size motor as the available space in this area is limited. The screw conveyor (C81009) will

have a universal joint after the first conveying horizontal section at the bottom, which is 1060 mm in length, feeding at an incline length of 3967mm, resulting from a 40° acute angle. The screw conveyor will have a second universal joint after an inclined section, which will change its conveying angle back to 0° angle. The screw conveyor will become horizontal after the second universal. The last horizontal section of the screw conveyor will have a 940 mm length where the screw inside the conveyor will end as detailed in concept drawings number ENS-MES-DWG-0004. The vertical length 210 mm on the screw conveyor shall not include a screw inside as the material will drop to the hopper by gravity.

7 Qualification of bidder

The equipment supplier and their authorized representatives are eligible to participate in the bid.

Essential qualification criteria for the bidder are as follows:

- Supplier shall follow ISO 9001: 2015 (or latest) quality management system or equivalent, certified for the design and manufacture of hoppers and screw feeders.
- The supplier shall have at least five years of experience in design and manufacturing of hoppers and screw Feeders.
- The bidder shall also submit the list of names of organizations where the supplier has supplied similar Equipment.

Offers not meeting these requirements will be treated as technically incomplete and will be rejected.

8 Conveyor Factory Acceptance Test

A Factory Acceptance Test shall be conducted or performed at supplier's facility. The supplier shall assemble the equipment, power it and make it ready for the Purchaser (Necsa) to witness the FAT before the Purchaser is called in to witness the FAT. The efficiency of the conveyor shall be tested for its optimum performance during test using the shredded material. All equipment shall be cleaned and dried on completion of the factory acceptance test. Equipment shall be disassembled, packaged, and be made ready for delivery to Necsa in Pelindaba.

PTFE Filter Destruction Project: Screw Conveyor Purchase Specification

Appendix A: Screw Conveyor (C81009) project specification sheets

GENERAL DATA				
Item number	C81009	Preparer	Mr MB Msane	
Revision number	1	Description SCREW CONVEYOR		
Date	10 June 2026			
FEED PROPERTY DATA				
Feed description		shredded/granulated PTFE material		
Fluid state		Solid and may be moist		
Heap Density		0.66 kg/L.		
Viscosity		N/A		
Temperature	Maximum Normal Minimum	30 °C AMBIENT 15 °C		
Pressure	Maximum Normal Minimum	1 atm - 10 kPa (g) - 20 kPa (g)		
CONVEYOR CONSTRUCTION DATA				
Equipment type		Conveyor		
Screw diameter (ID) & pitch		100 mm, 160 mm		
Rotating speed		Variable (100 – 300 rpm)		
Feed rate		80 to 120 kg/h		
Process exposed material		Mild or Stainless Steel		
Power		22 kW (TBC)		
Conveying distance		As per the attached conceptual drawings		
Approved By	Signed	Name	Date	Page

PTFE Filter Destruction Project: Screw Conveyor Purchase Specification

Appendix B: Screw Conveyor P&ID

