

Study tour report on Polyethylene covers (less than 60 microns) shredding machine and usage of shredded covers in laying of BT roads in Tiruvallur District of Tamilnadu State on 5-05-2017

Team consists of :

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The above team visited Ayyapakam Village in Villivakam Block of Thiruvallur District, Tamilnadu to study the process of shredding of Polyethylene covers with less than 60 microns and its usage in laying of BT roads.

I. Machine and its working :

The shredding process involves two stages. The first stage involves removal of dust and other materials that may be present in the Polyethylene covers which are collected as part of Solid Waste management in and surrounding GPs. For this purpose the machine shown below is used.

Cleaning Machine of Polyethylene covers:

In One hour the machine removes dust and other foreign materials present in 75Kgs of the Polyethylene covers. The removal of dust and other foreign materials from the Polyethylene covers to be shredded is important because the presence of these materials cause damage to the shredding machine and also impact the quality of the BT road planning to be laid using shredded Polyethylene material.

In the second stage, the dust free Polyethylene covers are shredded using the machine shown below:

Polythene Cover; Shredder;



The shredding activity is done in two steps: In the first step the Polyethylene covers are shredded by the machine into 10mm size pieces and in the second step the 10mm pieces are shredded by the same machine into 8mm pieces on changing the blade. In one hour the machine can shred 75Kgs of cleaned Polyethylene covers. Two different filters are used in the machine for giving 10mm and 8mm sized pieces.

But after interacting with the Project Director, DRDA, Tiruvalluru and other officers in Dharmapuri and Krishnagiri Districts of Tamilnadu it is understood that latest machines with high end technology are available in Ahmedabad and Coimbatore. The above machines in Tiruvalluru unit were installed in 2010 which are outdated and causing sound pollution and working with less efficiency.

Cleaning Machine of Polyethylene covers: (New Model)



Polythene Cover; Shredder (New Model)

The following rates were quoted to the above machinery by one agency to District Collector, Tiruvallur of Tamilnadu State.

Item with Technical Specifications:**1. Plastic Shredder machine**

Motor :10HP/1440RPM/440 V
Blade :10 nos.
Bearing : NTN
Output : 200-250Kgs
Filter : 8mm Holes
Price : Rs.2,13,300/-

2. Plastic Cleaning Machine

Motor : 1HP/1440RPM/440V

Drum : Mild steel

Price : Rs.85,050/-

Total : Rs.298350/-

Polythene Covers Shredder : (Two in one Model)



The following rates were quoted to the above machine by one agency from Salem of Tamilnadu State.

Item with Technical Specifications:

1. Plastic Shredder machine
Motor :10HP/1440RPM/440
Blade :10 nos.
Bearing : NTN
Output : 200-250Kgs
Filter : 8mm Holes

2. Plastic Cleaning Machine
Motor : 1HP/1440RPM/440
Drum : Mild steel

Total Rs.260000/-

II. Operation and management:

The plant consists of a shed with 3 rooms, one room houses the dust removal machine and other room houses the shredding machine and the third room is used as a store room, and is being managed by one Self Help Group (Ganapathi nagar SHG). The shed is constructed by DRDA and handed over to the SHG and the above said two machines are also purchase by the DRDA and handed over to the SHG in 2010 along with the working capital of 2 lakhs. Four to five SHG members are working in this unit for daily wages of Rs.300/day met from the sale proceeds.

The raw materials required for the plant are procured by the SHG which is managing the plant from the Gram Panchayats and also from rag-pickers. All the Gram Panchayats in Tiruvallur District of Tamilnadu State are implementing the Solid Waste Management Process and are providing required raw materials to the plant. The collected covers are with varieties between 40-60microns like carry bags, packaging covers, wrappers of different eatables like biscuits, Lays, Kurkure shampoo sachets, etc.,. The SHG which is managing the plant procures the raw material @Rs.10/-Kg including transportation cost. The shredded Polyethylene covers are sold at Rs.34/kg. During the verification of their sale proceeds we noticed that contractors from Chittoor, Nellore & Kadapa purchased the shredded Polyethylene Covers (8mm size) for using in BT roads.

Variables of Cover: :



Shredded Pieces (8mm) of Polyethylene Covers; ready to use in BT roads.



III. Laying of BT roads using shredded Polyethylene covers

8 to 10% of BT is replaced by shredded Polyethylene covers while laying BT roads. 6% is the ideal quantity and 10% is the maximum. The shredded Polyethylene covers are added to the metal chips in the hot mixing plant of Bitumen and the mixture of metal chips and shredded Polyethylene covers enter into BT chamber wherein the metal chips, shredded Polyethylene covers and the Bitumen mixes thoroughly. During this mixing process the shredded Polyethylene covers melt due to the high temperatures (roughly 150°C – 160°C) present in the BT chamber. This mixture is transported through tippers for laying of BT roads. We cannot use chips of plastic bottles because the temperature maintained in the chamber is not sufficient to melt them. 950 kgs of shredded plastic is used for laying 1km of BT road. Due to this durability of road increases by 2 years (from 5 years to 7 years).

Hot Mixing plant of Bitumen



In our way we got an opportunity to visit the Solid waste management segregation and compost unit of Puthmbakkam GP of Poonamallee Block in Tiruvalluru District. we were explained about the management and process by the AEE, BDO and Village secretary of that GP. The Gram Panchayat is implementing the programme. But currently Panchayat level SHG federation is maintaining Vermi compost unit.

Solid waste management unit, Puthambakkam GP, Poonamallee GP



VERMI COMPOST SHED CONSTRUCTED UNDER MGNREGS



PIT COMPOST SHED CONSTRUCTED UNDER MGNREGS & FFC



SEGREGATION OF GARBAGE BY THOMAI KAVALARS (CLEAN AMBASSADORS) @ 1 per 150 House Holders(MGNREGS)



**INTERACTION WITH THE PD, DRDA TIRUVALLUR & FILM SHOW ON
LAYING OF PLASTIC ROADS**



Recycle it all – no matter how small

Thanks for reading our brief report.