

Recovery and Reuse of Landfill Waste Plastics



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My Faith

My Guru



***"sincerity in the work with the faith in GOD
takes you beyond limitations"***

- Srimad Bhagavad Gita



My Team



Chandru



Kannan



Chander

My College



Awards

Vision - Dr. APJ. Abdul Kalam



Tech ICON Award



Padma Shri 2018



Maharana Udai Singh Award

Recognition

Ministry of Environment, Forest & Climate Change,
Govt. of India

Environmental Information System



TCE ENVIS RP

Resource Partner on Plastic Waste Management

Thiagarajar College of Engineering, Madurai

MSW – Municipal Solid Waste

Current Status

Landfill

Stored Material

Dumping Temporary

Continuous Filling
No Segregation

Incineration

Technical Non Technical

Problems :

- a. Leachate
- b. Gas toxic
- c. Unhygienic
- d. Water/Air/Land Pollution

Pollution :

- a. Air
- b. Water
- c. Land

Composition :

- a. Food Waste
- b. Organic waste
- c. Materials
- d. Plastic Waste & Etc.,

Recovery of Materials from Landfill

Bio Degradable

Manure

Non-Bio Degradable

Materials
Recycling



Plastic
Recycling & Reusing

Recovery of Plastic

Washing

Using Water
Dust Free Plastic
(Machinery Available)

Drying

Hot air drying
Dust Free Plastic

Plastic Segregation

Films and Foams

Mono & Multilayer,
Micron

less than (90)



Cups and bottles & thinner wall Containers

(up to 150 Micron)



Hard plastics

for recycling after
separation



Films/Foams (Micron < 90)

☐ Dried

☐ Shredded Plastics 2mm – 4mm

a. Used for road laying (1 km - SL / 1 L

Carry Bag/ Total 46 lac Road /200 lac Ton)

- No pot holes / cracking
- Life greater than 10 years
- Eco-friendly

b. Used to Plastone construction materials (in the form of Block, tiles , table top & \Toilet)

c. Uses for modified bitumen

Observation:

- Need = 200- 300 Lakh tons of plastics
- Available = 5.5 lakhs
- No problem w.r.t to Waste Plastic

SOLUTION TO POLLUTION - Reuse of Waste Plastics

PLASTONE



Rs. 12000

PLASTIC TAR ROAD



15 years

Other Products



Improved quality

Plastic Tar Road – A New Path way (Eco Friendly)



- **Use of Waste Plastics Films**
- **Better Road / Pathway Blocks / Toilets**
- **Saving of Bitumen**
- **Cost Less**
- **Solid Waste into Manure**
- **Job for Self Help Group**
- **Less Maintenance**
- **No Pot Holes**
- **Use of Scraps Too**
- **No CO₂ / No Dioxin**

Specialties

Waste Plastic for Plastone

Plastone



Block from polymer coated aggregate

- I. No Sand
No Water
No Bitumen
No Cement
No Adhesives
- II. a. Use of Waste Plastics (~ Max Weight 45%)
b. Low graded Stones, Ceramics, Concrete Debris, Etc.,
- III. Load Baring – 300 Tons; Malleable and Ductile
- IV. Reduction in Co2 Emission

1kg Plastic = 3kg of Co2 Emission

1kg Cement = 0.9 kg of Co2 Emission

PLASTONE = NO CO2 EMISSION



Patents

PLASTIC TAR ROAD PATENT - 2006


INTELLECTUAL PROPERTY INDIA
 (DESIGN | TRADE MARKS | GEOGRAPHICAL INDICATIONS)

GOVERNMENT OF INDIA
THE PATENT OFFICE
 PATENT (RULE-74) A-CIF: 871

No. _____ of _____ 20____

WHEREAS THIRAKARJEE COLLEGE OF ENGINEERING, TELUKKOTTA, TRICHY, TAMIL NADU, INDIA (AN INSTITUTION OF HIGHER LEARNING)

has been declared that he is the sole proprietor of an invention for a new and useful process of waste plastic in appropriate condition for plastic tar road pavement;

and that he is the true and first inventor (inventor) or his legal representative(s) or assignee(s) of the true and first inventor and that he is entitled to a patent for the said invention, having regard to the provisions of the Patent Act, 1970, as amended and that there is no objection to the grant of a patent to him there;

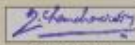
And whereas he has filed an application requesting that a patent may be granted to him for the said invention;

And whereas he has filed his said application particularly describing the said invention and the manner in which the same is to be performed;

Now, these provisions of the Patent Act, 1970, as amended and the conditions specified in Section 47 of the said Act, and in the conditions and provisions specified in any other law for the time being in force, have the effect of enabling him to prevent third parties from making, using, offering for sale, selling or importing for these purposes for a new and useful process of waste plastic in appropriate condition for plastic tar road pavement;

and seeing that _____ and seeing, referring to the sale, selling or importing for these purposes the product obtained if any, directly by that process in India, provided that the product obtained if any is a product in respect of which no patent shall be granted under this Act for a term of twenty years from the _____, maintainability of _____, and of authorizing any other person to do so, subject to the condition that the validity of this patent is not guaranteed and that the licensee for the maintenance of this patent shall pay _____

In witness whereof, the Controller has caused this patent to be signed at the _____ on _____ 2006.


 Controller of Patents

Date of Grant: _____ / _____ / 2006 (Date)

Note: The fee for renewal of this patent, if it is to be maintained, will fall due on _____ of _____ and on the same day in every year thereafter.

PLASTONE BLOCK PATENT - 2020


INTELLECTUAL PROPERTY INDIA
 (DESIGN | TRADE MARKS | GEOGRAPHICAL INDICATIONS)

GOVERNMENT OF INDIA
THE PATENT OFFICE
 PATENT CERTIFICATE (Under the Patent Act, 1970)

Patent No.: 344070
 Application No.: 201721021514
 Date of Filing: 06/09/2017
 Inventor: THIRAKARJEE COLLEGE OF ENGINEERING

INVENTION: A PROCESS AND A SYSTEM FOR MANUFACTURING OF TILES/BLOCKS FROM WASTE PLASTICS

It is hereby certified that a patent has been granted to the patentee for an invention entitled A PROCESS AND A SYSTEM FOR MANUFACTURING OF TILES/BLOCKS FROM WASTE PLASTICS as disclosed in the above mentioned application for the term of 20 years from the 6th day of September 2017 in accordance with the provisions of the Patents Act, 1970.


 Controller of Patents

Date of Grant: 06/09/2017

Note: The fee for renewal of this patent, if it is to be maintained, will fall due on 06th day of September 2019 and on the same day in every year thereafter.

Thicker Plastics

- Thicker Plastics (bottles, domestic appliance (91-200 Micron))
- Dried and shredded (2 mm)
- Used as filler in plastone and other products
- 1 Sq. metre : 12 KG Plastic (12000 Carry Bags) & 1KG Hard, shredded plastic
- Used for Structural materials

Hard Plastic

- Crushed & shredded ; recycle
- Consumer Products

Care for future Careful future

- **No place** for deposit of waste in the cities
- Use **own yourself** principle
- **Segregation at source** of having multi bin system
- Develop **pits at in-situ** place and help Decompose
- Develop **habit of reducing waste** ,



Dumping in Future

- **Step 1:** Primary segregation
- **Step 2:** Secondary dumping

Houses:

Pit inside the house to collect and help decomposition

Community hall:

Provision for disposal at there own place (PIT)

Multi story building :

Centre place to collect waste'

Municipal corporation :

- Collected and help reuse
- No dumping in any space
(Space Not available)

Green Design

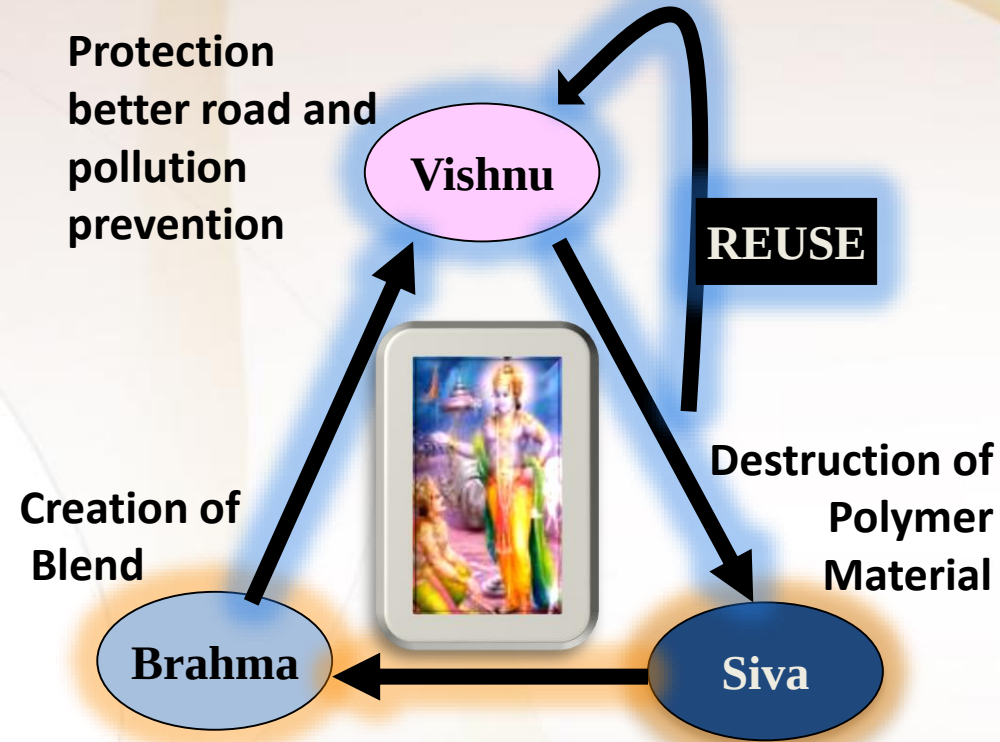
Reduce, Reuse, Recycle

Waste Prevention

1. Reduce weight, toxicity & use of energy
2. Produce durable materials

Better management :

- Remanufacturing
- Recyclable
- Reusing
- Compounding
- Scientific Disposal



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Thank You

