



# THERMA BLOCK

DEPARTMENT OF MATERIALS AND  
METALLURGICAL ENGINEERING

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## PROJECT AIM

TO DEVELOP A SUSTAINABLE THERMAL INSULATOR BY REPURPOSING  
INDUSTRIAL BUFFING DUST WASTE

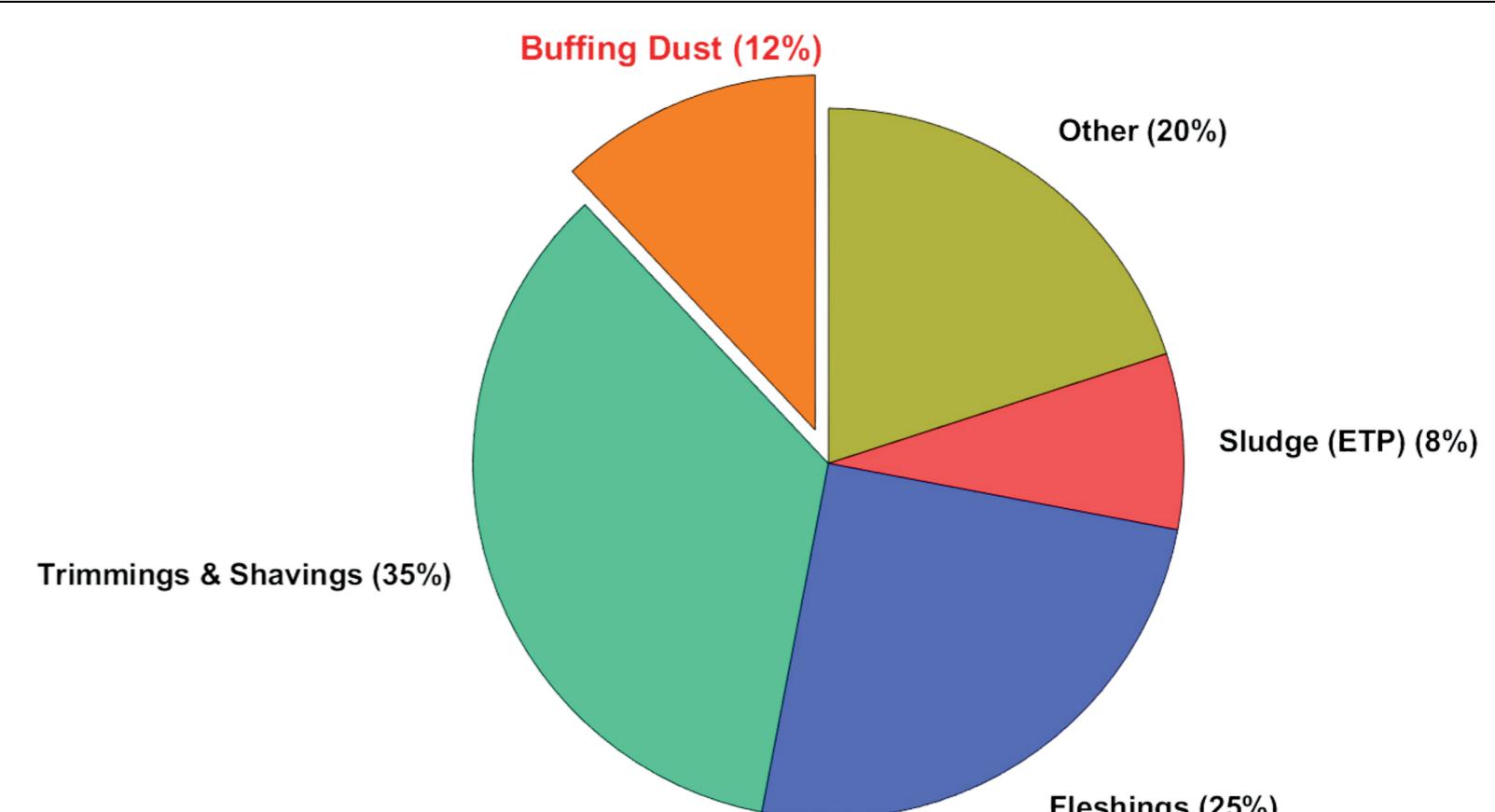
### WHY BUFFING DUST

#### PRODUCTION RATE:

Bangladesh produces between  $1.18 \times 10^4$  and  $3.54 \times 10^4$  tonnes buffering dust annually

#### THE PROBLEM:

In Bangladesh, buffering dust from tanneries is often disposed of improperly, with many tanneries simply dumping it directly into landfills or drains, leading to significant environmental contamination due to the high chromium content in the dust



#### PROPOSED SOLUTION: Thermal Insulator



#### Main Body

Buffing Dust  
Polyester Resin  
Citric Acid

#### Coatings

Polyethylene  
jute Fiber

#### WHAT OUR PRODUCT OFFERS:

- Reduction of Improper Disposal
- Encapsulation of Chromium
- Circular Economy Approach

### WHY THERMAL INSULATOR

By focusing on thermal insulators we address an environmental challenge and also provide a practical, low-cost solution.

#### PLAN :

#### YEAR ONE:

Supplying Thermal Insulator to households in **Panchagrah**, targeting 15% household (50,000 households)

#### Buffing dust Utilization :

5.25% of total waste - 70.25 tonnes

#### YEAR TWO:

Addition of warmer districts and industrial building rooftop insulation

#### Buffing dust Utilization :

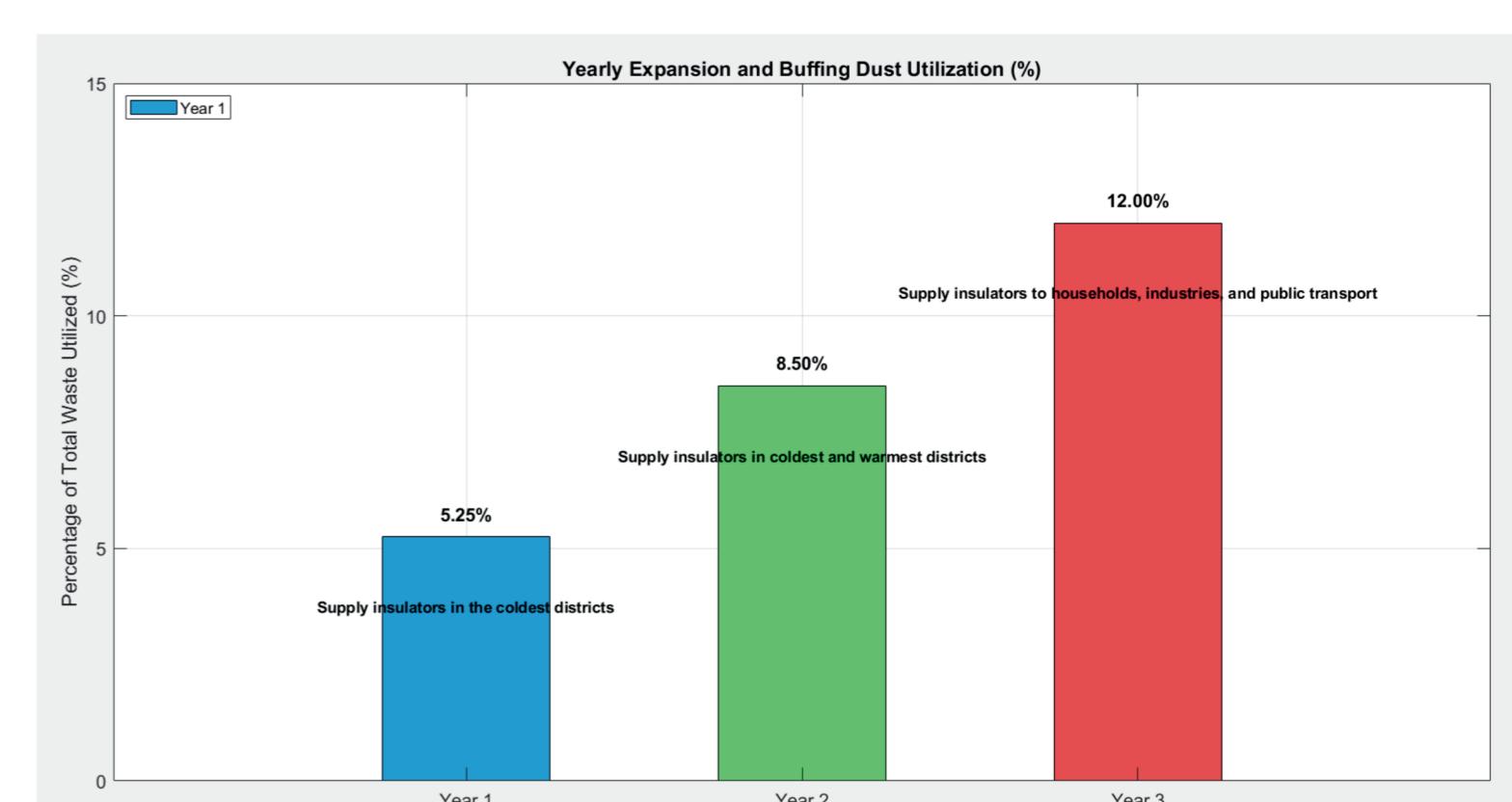
8.5% of total waste - 113.9 tonnes

#### YEAR THREE:

Addition of public transport

#### Buffing dust Utilization :

12% of total waste - 160.80 tonnes



#### WORKING PROCEDURE:

##### Buffing Part

- Mixed 20g citric acid, 56g resin, and 15g buffering dust mixture transferred to mold and heated at 200°C for 20 minutes.

##### Composite Layers

- Made polyethylene-jute layers in a hot press and cut to size.

##### Assembled Structure

- Bonded foamy part with layers using a glue gun.

#### PRODUCT ANALYSIS:

##### Insulation :

Capable to insulate 47 degree Celsius

##### Thermal Conductivity :

**0.03121 W/m•K**

##### Density :

**0.78 g/cm<sup>3</sup>**