The Polyurethane Company

PFEDA SYNTHETICS PVT. LTD.

WELCOME

🙏

Confederation of Indian Industry (CII).

Innovation Project -01 (Recycling of Scraped PU with Supplier (Rymbal')

Trigger of the Project: ~5% PU Waste,(24 Ton Annually=48 Lakhs).
Uniqueness: Reutilizing PU waste through **chemical recycling** into reusable polyols.

pfeda
The Polyurethane Company

COMPANY PROFILE

PFEDA Synthetics Pvt. Ltd.

- Pfeda Synthetics Pvt. Ltd was incorporated in 1983.
- Production started in 1985.
- The company has a strong customer base in the automotive & Non-Automotive field.
- It primarily serves the Truck and Earth Moving segments.
- Pfeda has remained a "Preferred Supplier" to top brands in the industry.
- This status is due to its:
  - Consistent performance
  - Strong quality consciousness.

Our Units

Unit-01 :-W-7, W Block, Sector 11, Noida, Uttar Pradesh 201301

Unit-02:- W-15/16, W Block, Sector 11, Noida, Uttar Pradesh 201301

Unit-03:- C-6,7 & 8, EPIP Kasna, Surajpur Industrial Area, Site-V, Greater Noida - 201 306

Our Products




Our Certification's

ZED GOLD CERTIFICATE :- 24 May 2025

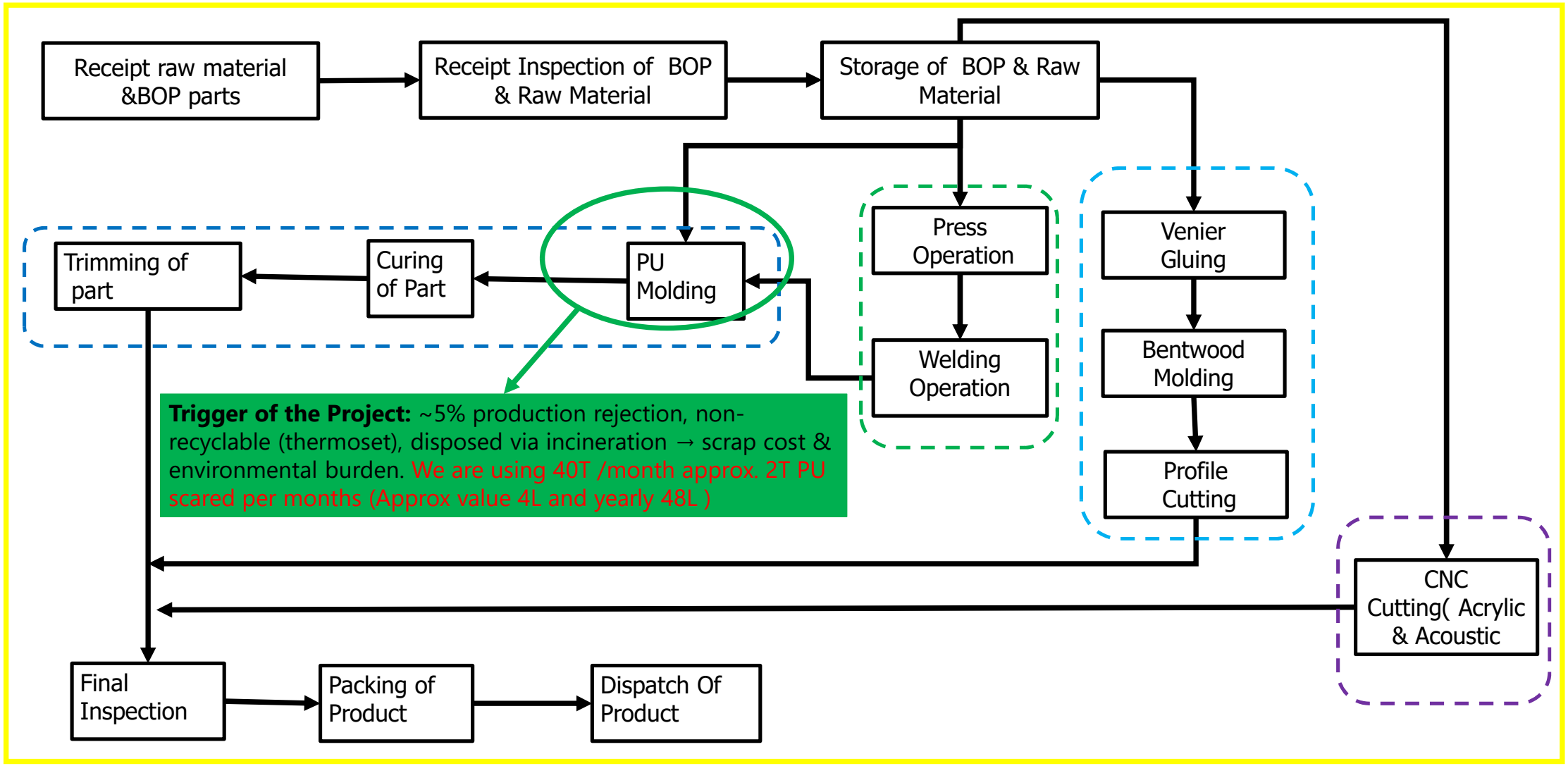
IATF 16949:2016:- 10.02.2024~ 09.02.2027

ISO 14001:2015:- 10 .08.2024~ 09.08.2027

ISO 45001:2018:- 19.07.2023~ 18.07.2026

GREENCO CERTIFICATE :- 16 Aug 2028

Process Map


Receipt raw material &BOP parts
Receipt Inspection of BOP & Raw Material
Storage of BOP & Raw Material
Press Operation
Venier Gluing
Trimming of part
Curing of Part
PU Molding
Welding Operation
Bentwood Molding
Profile Cutting
Trigger of the Project: ~5% production rejection, non-recyclable (thermoset), disposed via incineration → scrap cost & environmental burden. We are using 40T /month approx. 2T PU scared per months (Approx value 4L and yearly 48L)
CNC Cutting(Acrylic & Acoustic
Final Inspection
Packing of Product
Dispatch Of Product

Project Overview: Recycling of Scraped PU with Supplier (Rymbal)

Project Title: Recycling of Polyurethane Waste

Trigger of the Project: ~5% production rejection, non-recyclable (thermoset), disposed via incineration → scrap cost & environmental burden. We are using 40T /month approx. 2T PU scared per months (Approx value 4L and yearly 48L)

Uniqueness: Reutilizing PU waste through **chemical recycling** into reusable polyols.

Timeline: Commencement – Jan 2025 | Completion – Mar 2026

Roadmap & Milestones:

Jan 2025 – Kick-off
Mar 2025 – Initial lab trials
Aug 2025 – Pilot trials & validation
Dec 2025 – Commercial trials
Mar 2026 – Full implementation

Tangible Benefits

- **Cost Savings:** ~40T PU used monthly → ~2T recycled PU reused per month (≈ **4L/month, 48L/year**).
- **Significant Environmental Gains:** Overall benefit ranges **9% to 23%** across key sustainability categories.
- **Global Warming Potential:** ~**12% lower CO_2 emissions** vs. conventional PU. That's about **76.8 tonnes of CO_2 eq. saved annually**.
- **Ozone Depletion:** Reduced by **23.3%**, the highest impact improvement.
- **Resource Efficiency:** Reduced **fossil oil usage (-10%)** and **water consumption (-12%)**.
- **Broad Sustainability Impact:** Recycled PU shows measurable reduction across **all LCA parameters** (energy, emissions, land use, toxicity).

Intangible Benefits

1. **People & Society** → Less landfill & incineration; healthier environment & communities.
2. **Employee Morale** → Pride in sustainability; fosters innovation & responsibility.
3. **Skill Development** → Hands-on with recycling tech; boosts R&D & operations capability.
4. **Culture Shift** → Embeds circular economy mindset; long-term green practices.
5. **Industry Reputation** → Positions brand as a sustainability leader; builds stakeholder trust.
6. **ESG Alignment** → Supports Net Zero & ESG goals; enhances investor confidence.

Implementation Status & Replication Potential

Before

After

Before / After: Before → 5% PU waste → incineration → high cost & emissions.
After → Chemically recycled into reusable polyols → cost saving + sustainability.

Replication Potential:

Within Group: Technology adopted across plants, cross-functional teams.

Within Sector: Scalable model for footwear, seating, and foam industries.

Implementation Status & Replication Potential

Plan for Further Scale-up:

Year 1: Expand recycled PU use to **10–15%** of total production.

Year 2: Integrate **20–30% recycled polyols** into multiple PU applications.

Train next-level teams for **succession planning** and smooth adoption.

Replication Potential (Beyond Group):

Furniture Industry – Use in flexible foams, cushions, and mattresses.

Footwear Industry – Footwear Soles formulations with recycled polyols.

Automotive Industry – Seating foams, headrests, and NVH components.

Potential to set **new industry standards** in sustainable PU applications.

Dissemination:

Internal workshops, technical bulletins, and staff training.

Showcase project at **CII forums, sustainability conferences, and industry associations**.

Publish **success stories** to promote wider adoption across the PU value chain.

Challenges in Implementation

Technical:

•High viscosity → pump & flow issues.

•Requires heating/stirring modifications.

Administrative:

•Segregation of PU waste → added cost.

•Logistics challenge: blown material has ~3 × volume coverage.

Maintenance:

•Pump blockages & wear due to viscosity.

Frequent preventive maintenance required.

Benchmarks & Comparisons

The Polyurethane Company

Non –Recycled Report

Inhouse Tensile and Elongation Test Report

Dumbbell Specification			Dumbbell Ratio		Date
Size	Dim. (In mm)	Dim. (In cm)			
Length	60	6	ISO		18.04.2025
Width	26	2.6	Poly		
Thickness	3	0.3	RATIO		
Area	Width X Thickness	0.78			

Tensile Strength

Load at Break point (in Kg) =	24.6		Tensile Specification = 2.1Kg/cm²
Tensile Strength =	Force /Area		Result: Ok
T.S =	31.54	kg/cm²	

Elonagation test Report

Length at Break point =	142.5	mm	Elongation Specification = Min. 110%
Elongation % =	Length at break point / Dumbbell Length		Result: Ok
Elongation % =	237.50		

Checked By:- Jitendra — Approved By:- Mr. Anil Kumar Singh

Recycled Report

Inhouse Tensile and Elongation Test Report

Dumbbell Specification			Dumbbell Ratio		Date
Size	Dim. (In mm)	Dim. (In cm)			
Length	60	6	ISO		18.04.2025
Width	26	2.6	Poly		
Thickness	3	0.3	RATIO		
Area	Width X Thickness	0.78			

Tensile Strength

Load at Break point (in Kg) =	23.1		Tensile Specification = 2.1Kg/cm²
Tensile Strength =	Force /Area		Result: Ok
T.S =	29.62	kg/cm²	

Elonagation test Report

Length at Break point =	126.7	mm	Elongation Specification = Min. 110%
Elongation % =	Length at break point / Dumbbell Length		Result: Ok
Elongation % =	211.17		

Checked By:- Jitendra — Approved By:- Mr. Anil Kumar Singh

Flat Armrest Parts


Fender Parts


Floor Mate Parts

PU Molding /Automotive Parts


The Polyurethane Company

Benchmarks & Comparisons

Property	Benchmark Specs	Recycled Product	Non-Recycled Product
Tensile Strength (kg/cm^2)	≥ 2.1	29.6	31.5
Elongation (%)	≥ 110	211.2	237.5

Key Takeaways:

- ✅ Both recycled and Non recycled product **exceed benchmark specifications** in tensile strength and elongation.
- ✅ Elongation values are **~2× higher than required**, showing superior flexibility.
- ✅ Confirms **technical feasibility** of using recycled PU without compromising quality.
- ✅ Strong evidence to support **scaling up for industrial adoption**.

Priority Plans (+1 year / +2 years)

1. Performance Evaluation

Set KPIs: strength, elongation, viscosity, efficiency
Track commercial vs. lab results
Annual performance reporting

2. Scaling Up

- **+1 Year:** 10–15% recycled PU in production
- **+2 Years:** 20–30% in footwear, seating, foams
- Partner with supply chain for adoption

3. Training & Education

- Workshops for operators, QC, R&D
- Develop SOPs & technical manuals
- Share learnings at forums & with partners

4. Continuous Improvement

- Optimize formulations for viscosity & pumpability
- Improve segregation & collection systems
- Explore additives for performance boost

5. Resource Requirement

- Invest in pumps, heating/stirring, storage
- Dedicated R&D + production teams
- Budget for logistics & maintenance

The Polyurethane Company

Top 10 Best Practices adopted during project implementation phase

1. **Segregation at Source** – Dedicated PU waste separation.
2. **Closed-Loop Collection** – Efficient scrap return logistics.
3. **Viscosity Management** – Pre-heating & stirring for smooth flow.
4. **Pump Maintenance** – Preventive checks to reduce downtime.
5. **Formulation Optimization** – Balance viscosity & product quality.
6. **Performance Benchmarking** – Regular tensile/elongation testing.
7. **Training & Awareness** – Operator & R&D capacity building.
8. **Cross-Functional Collaboration** – Production + R&D + Sustainability teamwork.
9. **Cost–Benefit Tracking** – CO_2, waste reduction & ROI analysis.
10. **Knowledge Sharing** – Forums, publications, industry outreach.
11. **Standardization**- Maintain 4M During the Change.

The Polyurethane Company

Major Key learnings from the project outcome

1.Recycling is Viable

Recycled polyols can be reused in PU formulations **without compromising quality**.

2. Sustainability Creates Business Value

Recycling **cuts scrap costs (48 lakhs in annual savings), lowers emissions, and boosts ROI & credibility.**

3. Performance Surpasses Benchmarks

Chemically recycled PU showed **higher tensile strength & elongation** than standards.

4. Process Reliability Needs Discipline

Consistency depends on **strict waste segregation & preventive maintenance**.

5. Viscosity is the Bottleneck

High viscosity requires **heating, stirring, and pump modifications**..

6.Collaboration Accelerates Change

Success achieved through **R&D, Production, Sustainability & Logistics teamwork**.