

CREATIVE ENGINEERING DESIGN

TEAM CHAIRNOBYL

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L I S T O F

CONTENTS

- | | | | |
|-----------|------------------------------------|-----------|----------------------------------|
| 01 | P-TYPE CHAIR | 06 | MATERIALS USED |
| 02 | THE MANUFACTURER | 07 | MANUFACTURING
PROCESS |
| 03 | LIFE CYCLE OF THE
CHAIR | 08 | END OF CYCLE |
| 04 | STAKEHOLDERS
INVOLVED | 09 | INFERENCES |
| 05 | BILL OF MATERIALS | | |

INTRODUCTION



P-TYPE CHAIR

FEATURES

History

- Known as the “**Visitor chair**”
- Frame shaped like the letter “P” from the side
- Used in offices, schools and public institutions as visitor seating



Economical Features

- At **Rs. 1600 MRP***, it is cost-effective, making it accessible for large-scale use

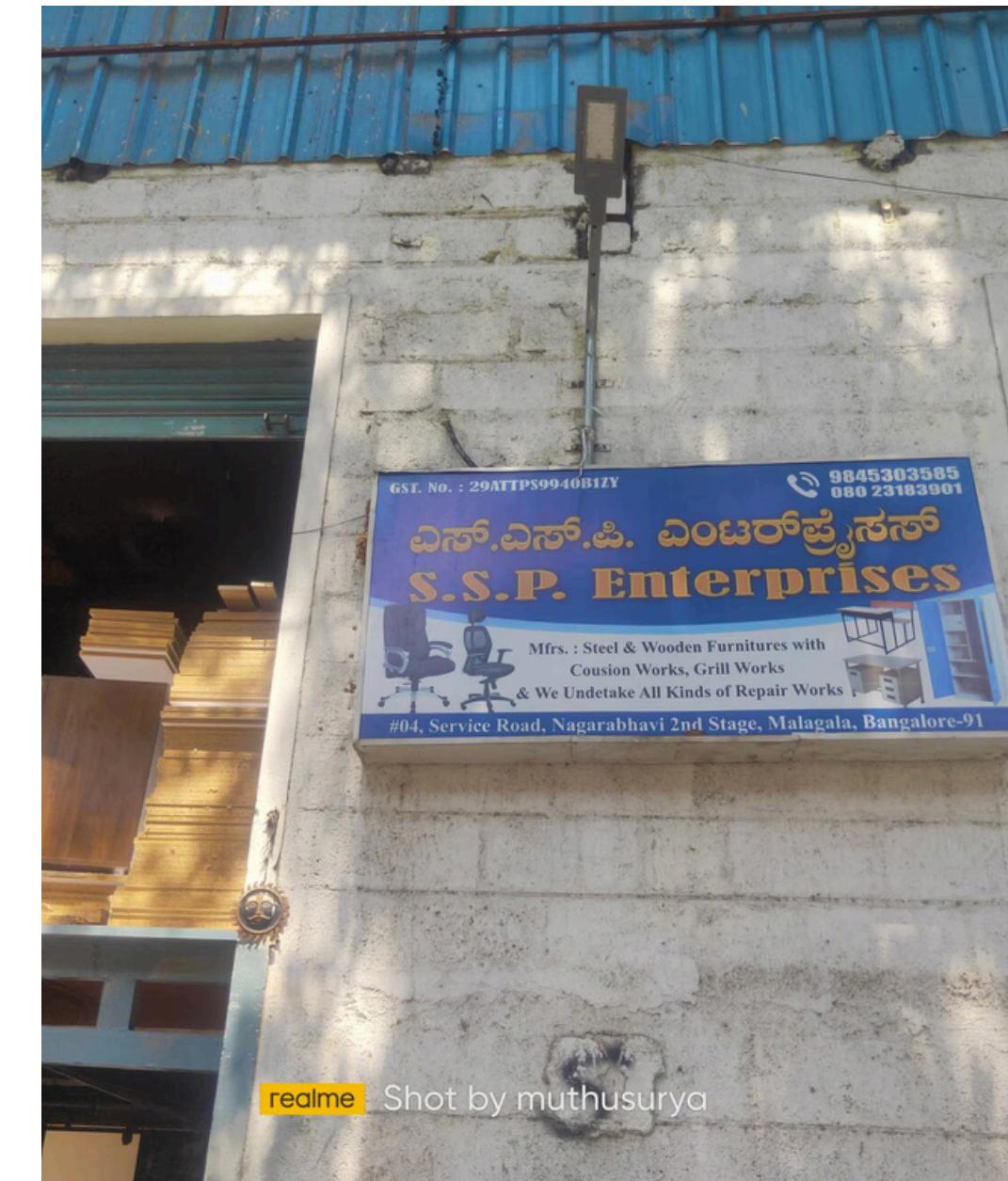
Ergonomics:

- Slightly curved backrest for basic lumbar support, designed for short-duration seating

A N O V E R V I E W O F

SSP ENTERPRISES

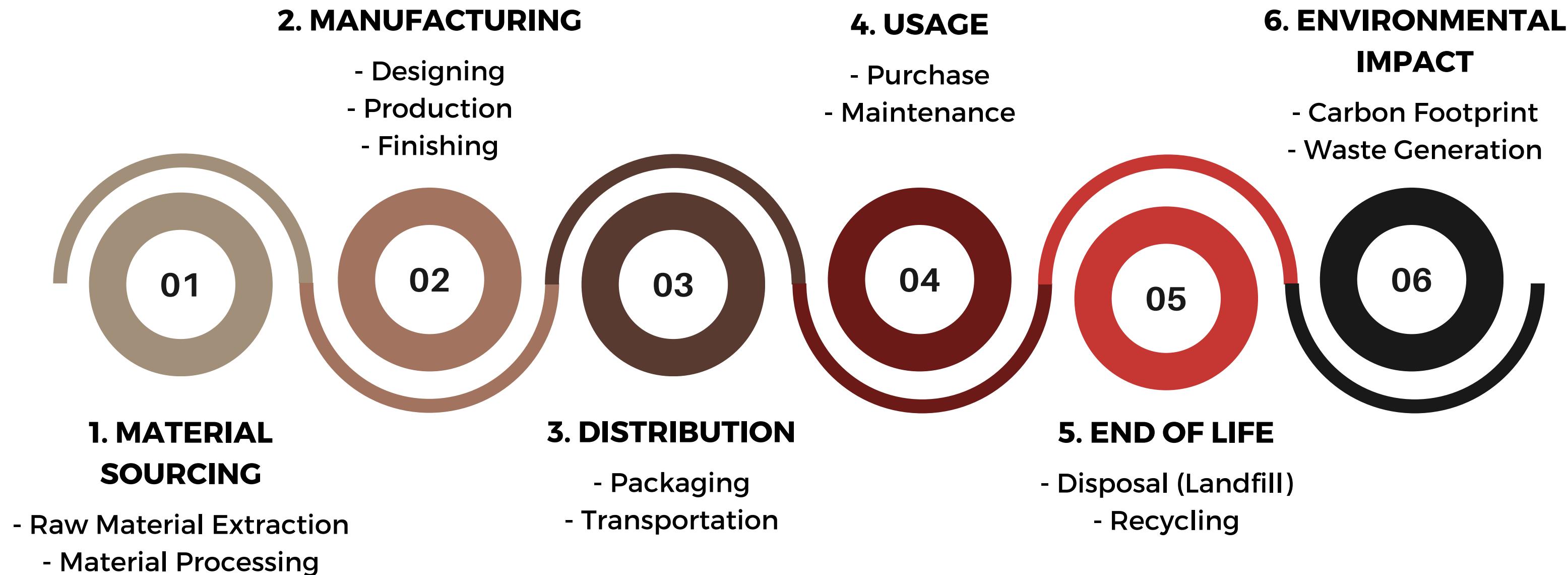
- Furniture manufacturers located in Nagarbhavi, West Bangalore.
- B2B and B2G business primarily.
- Specializes in high-quality Chairs, Almirahs, School Desks, Tables, and Cots.
- Multiple Units for Assembly, Fabrication, and Showroom display.



**30 years of
experience**

60+ employees

C H A I R ' S
LIFE CYCLE



PROJECT

STAKEHOLDERS

01 Material Sourcing

- Foresters and Loggers
- Mining Companies
- Petrochemical Companies

02 Material Processing

- Sawmill workers
- Metal Refineries workers
- Plastic Manufacturers
- Textile and Foam Manufacturers

03 Manufacturing

- Designers/ Engineers
- Factory Workers
- Quality Control Inspectors

This comprehensive list illustrates the complexity and interconnectedness of the processes involved in bringing a chair from concept to consumer and beyond.

04 Supply Chain and Distribution

- Raw material suppliers
- Warehouse Operators
- Freight Companies

05 Usage

- Consumers
- Customer Support Teams

06 End of Life

- Recyclers
- Waste Disposal Companies

07 Regulatory and Compliance

- Government Regulatory Agencies
- Environmental NGOs

BILL OF MATERIALS



PARTS OF THE CHAIR



SEAT



BACKREST



FRAME



CHAIR



FASTENERS



HANDREST



BUSH

BILL OF MATERIALS - BOM

Component	Material	Quantity
Chair Frame	Mild Steel - Hollow	1
Armrest - Cushion + Mount	PU foam - ISF + Mild Steel	2
0.75" Screw	Galvanized Steel	4
1.75" Screw	Galvanized Steel	4
0.75" Nut	Galvanized Steel	4
1.25" Nut	Galvanized Steel	4
0.5" Washer	Galvanized Steel	4
1.25" T-Nut	Galvanized Steel	4

BILL OF MATERIALS - BOM

Component	Material	Quantity
Floor Bush	Nylon	4
Seat Base	Plywood - 18x18x1/2"	1
Backrest	Plywood - 14x18x1/2"	1
Seat Cushion	Low Density Polyurethane foam	1
Seat Cushion Substrate	Expanded Polyethylene (EP) Foam	1
Upholstery	Polyester	1
Cling Wrap	Plastic - LDPE	1
Bubble Wrap	Plastic - LDPE	1

MATERIAL CATEGORIES





PLASTICS



Polypropylene



Polyester



EPE

Properties

- **Lightweight**
- **Flexible**
- **Tough**

- **Strong**
- **Resistant**
- **Unabrasive**

- **Lightweight**
- **Rigid**
- **Easy to mould**

- **Great physical resistance against flex and temperature**

Use

- **Backing fiber of the chair**

- **For the upholstery covering the chair**

- **Substrate of the cushion**

- **Integral Skin Foam**
- **Low-Density foam**

Reason

- **Resistance to wear and tear**
- **Durable**

- **Durable**
- **Easy to clean**
- **Dries quickly**

- **Helps cushion maintain its shape**

- **Comfort**
- **Durability**
- **Maintains its shape over a long time but also soft**

WOOD



Plywood

Properties

- Strong
- Flexible
- Resistant to cracking

Use

- Used for the backrest
- Also in the seat panels

Reason

- Due to the layered structure, provide immense strength

Reason

• Due to the layered structure, provide immense strength

Metal



Mild Steel

Properties

- Strong
- Ductile
- Weldable

Use

- Provide structural strength

Reason

- Supports weight well due to durability

• Supports weight well due to durability



Galv. Steel

Properties

- Lightweight
- Flexible
- Tough

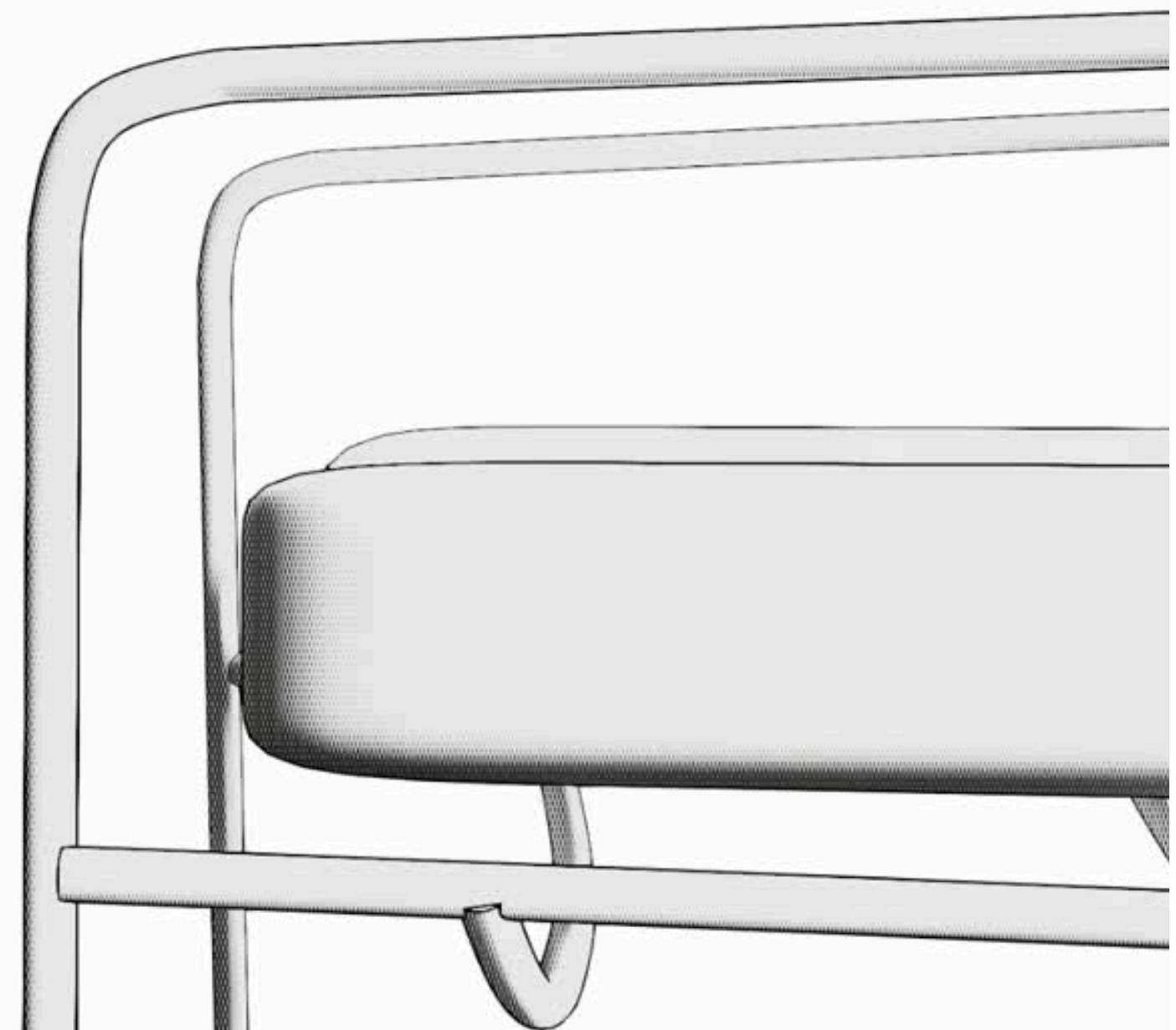
Use

- Used for the fasteners

Reason

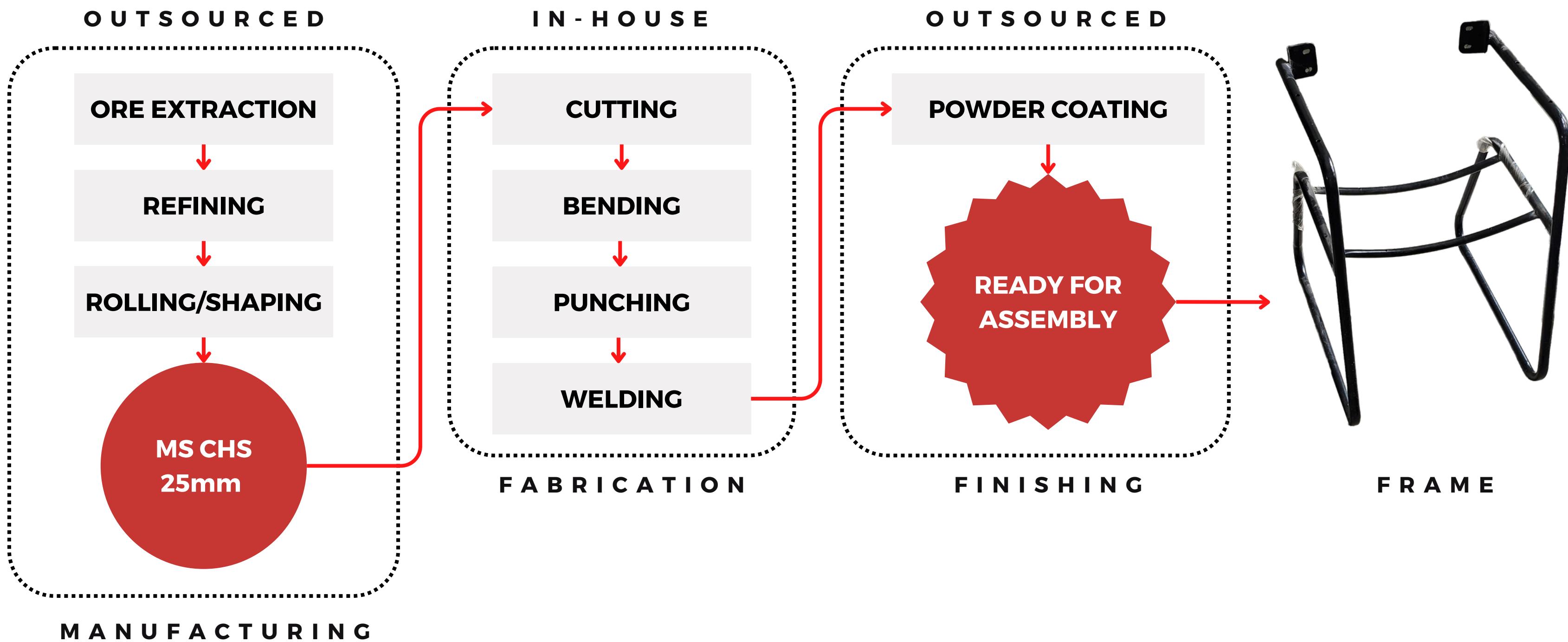
- Corrosion resistant
- Also no effects of humidity

MANUFACTURING



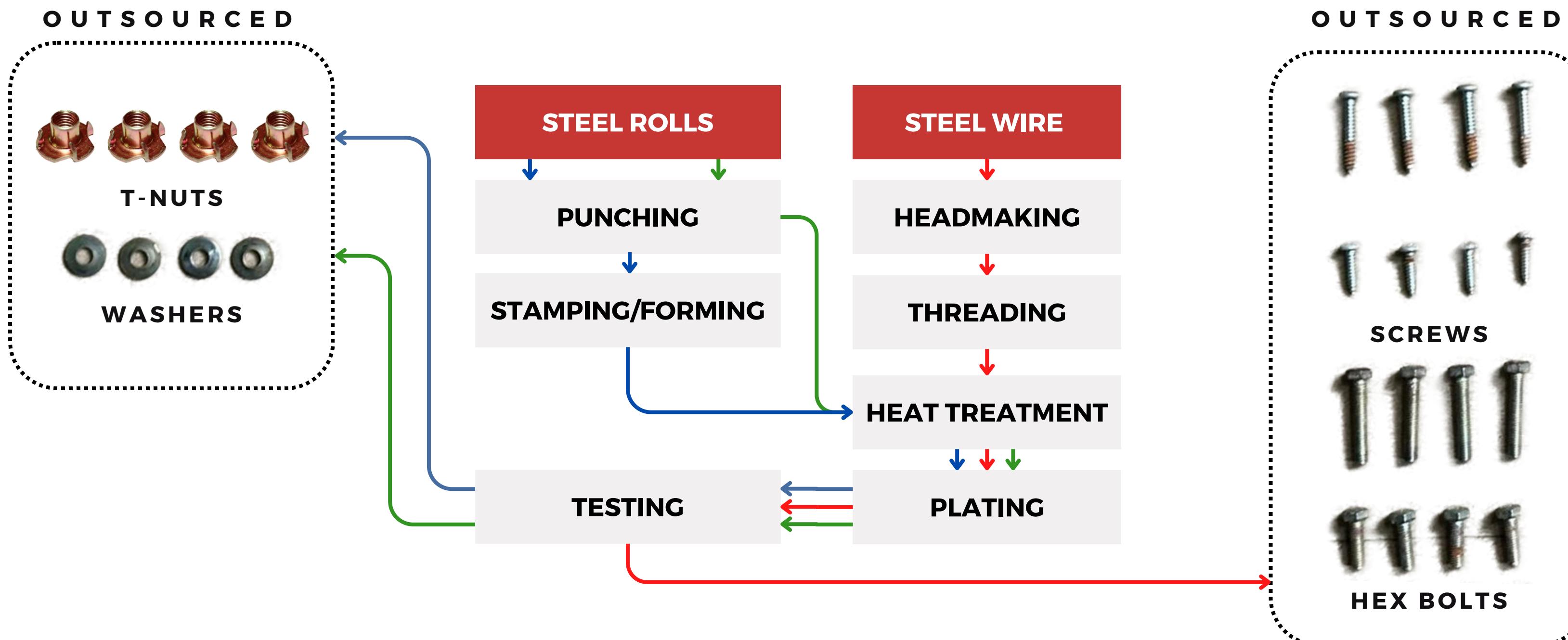
MANUFACTURING

M E T A L C O M P O N E N T S : M I L D S T E E L



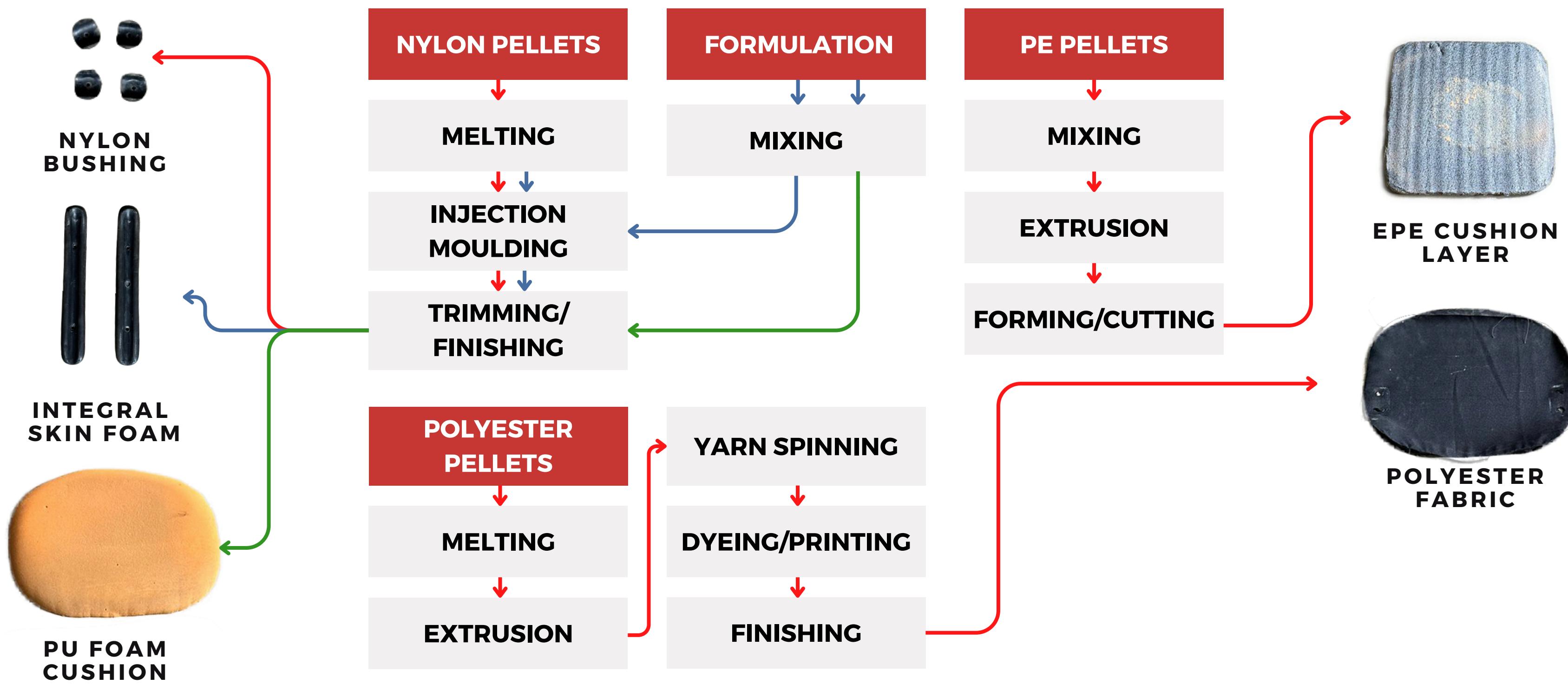
MANUFACTURING

M E T A L C O M P O N E N T S : F A S T E N E R S



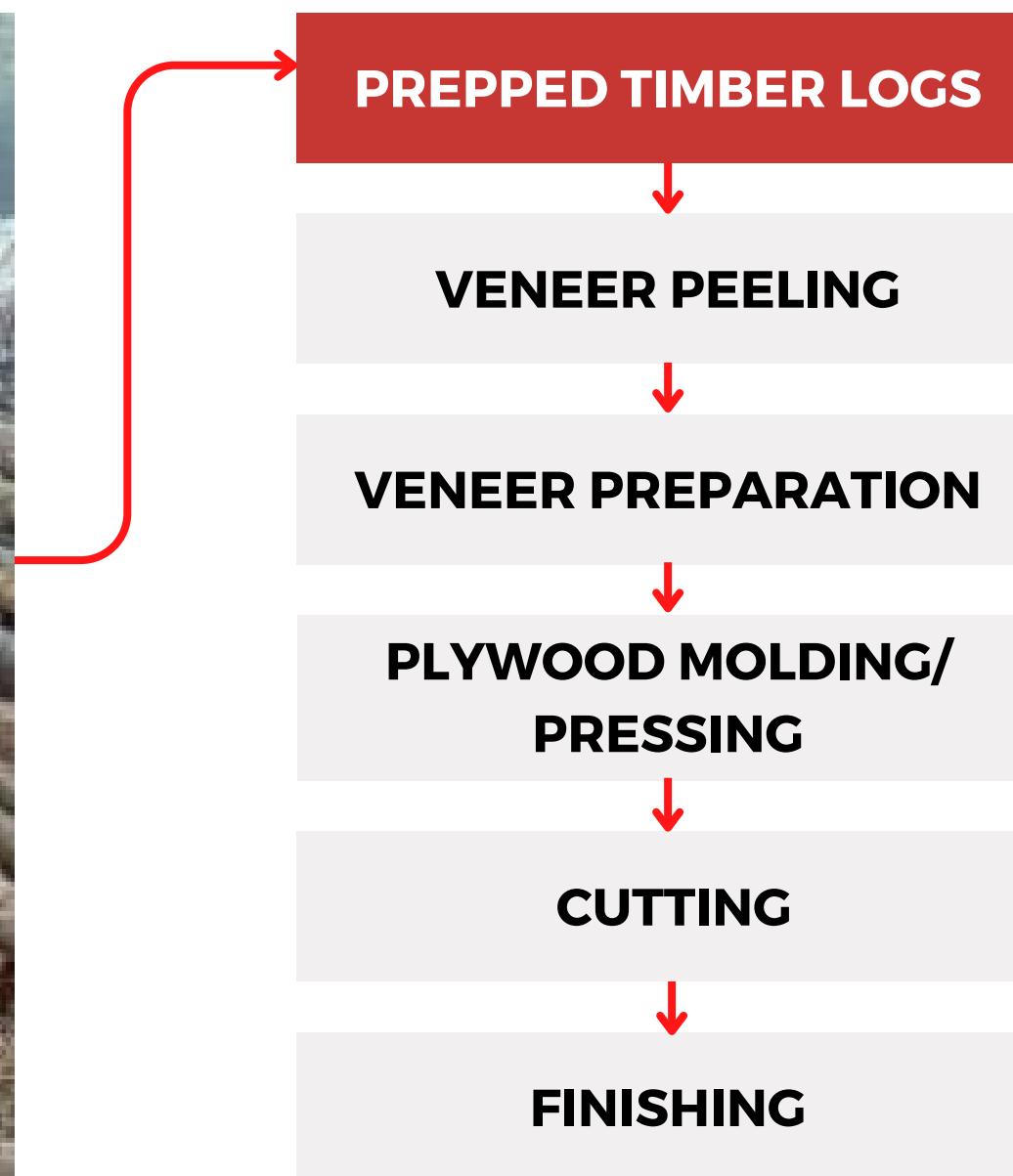
MANUFACTURING

PLASTIC COMPONENTS

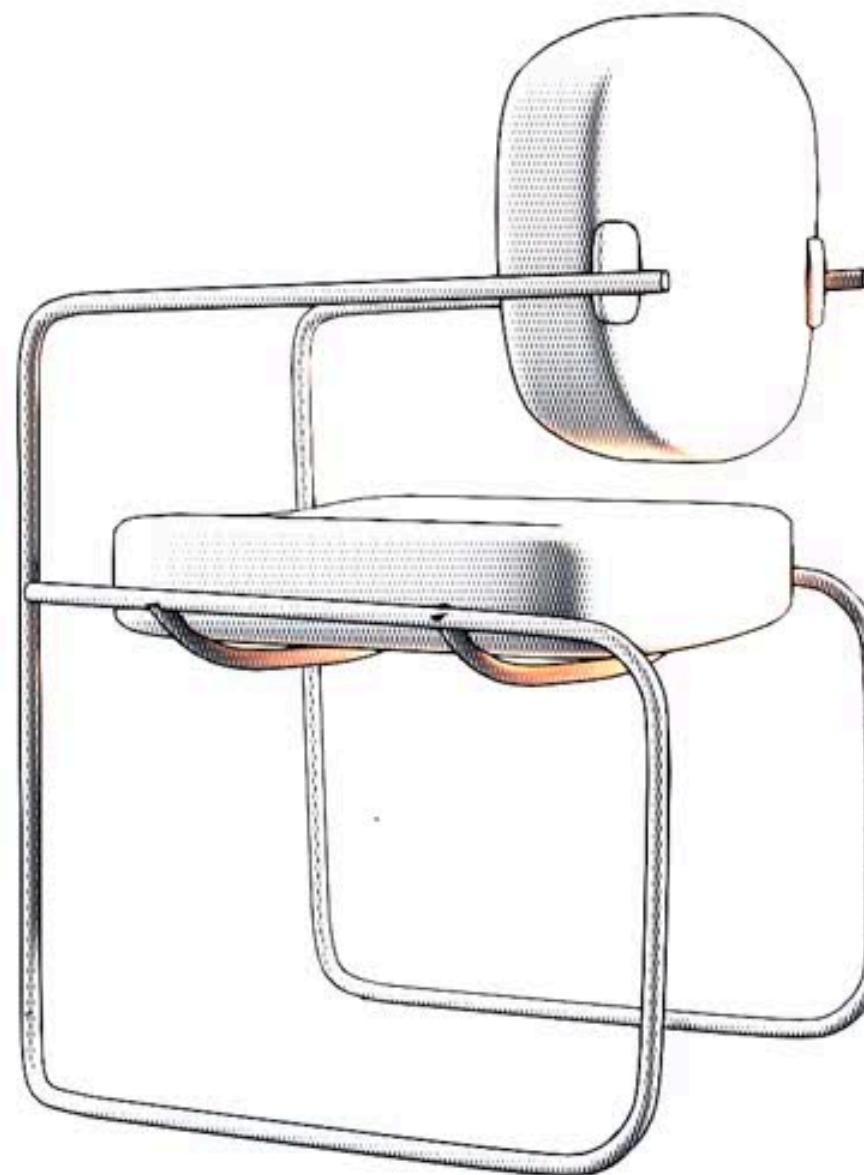


MANUFACTURING

WOOD COMPONENTS : PLYWOOD



END OF LIFE CYCLE



END OF LIFE CYCLE

O P T I O N S A V A I L A B L E

Repair

- Usually the first choice.
- Possible at low cost, often by changing parts.



Refurbish

- In house refurbishing the returned chair
- Prolongs the life of the chair and reduces waste,



Recycle

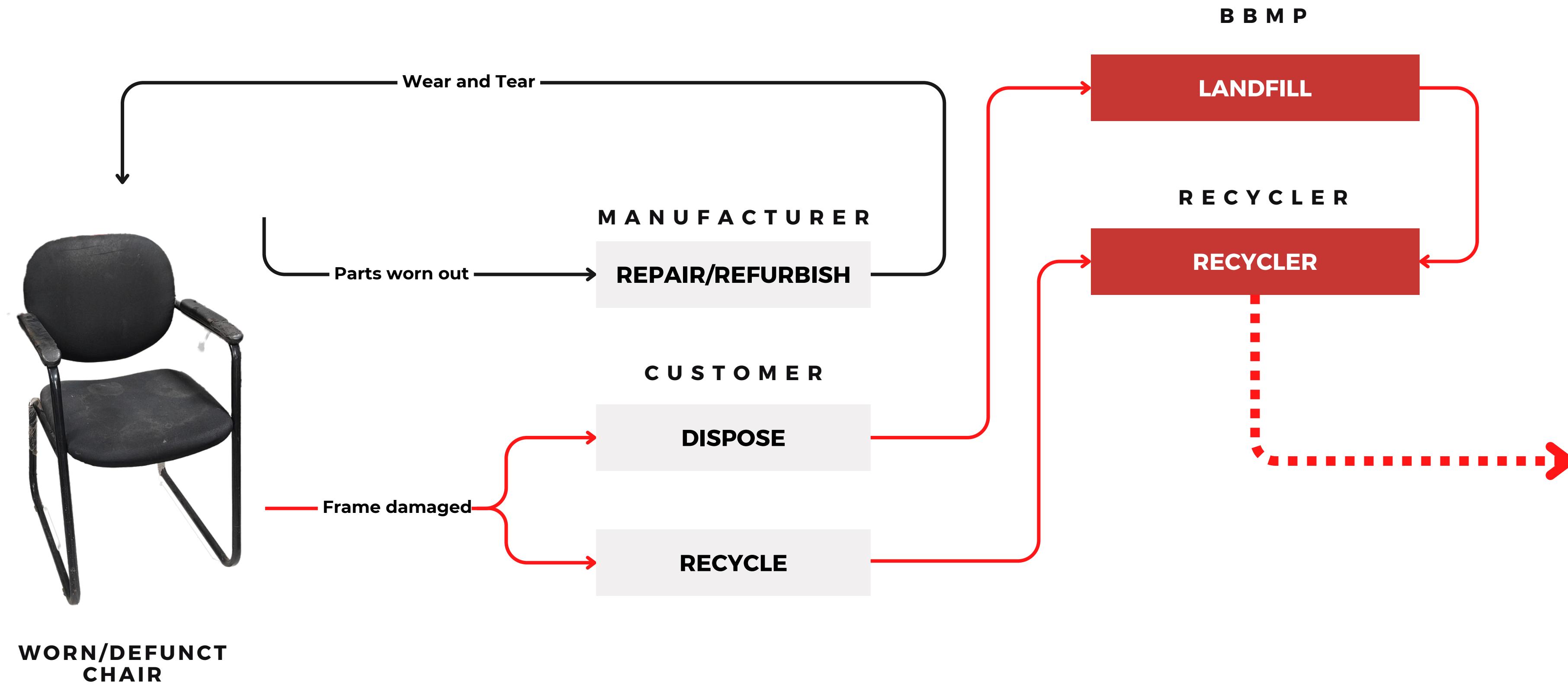
- Facility not provided by the manufacturer.
- Left as an option to consumer.



Images are representative

END OF LIFE CYCLE

O B S E R V E D P R O C E D U R E



END OF LIFE CYCLE

O B S E R V E D P R O C E D U R E

- SSP ENTERPRISES does not have their own recycling centres
- Authorized collection centers recycle worn-out chairs for both the government and the company
- Chairs that are not sent to the collection centres end up in a dump yard



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Recycling / Consulting / Engineers / Contractors / Sourcing / Projects

END OF LIFE CYCLE

O B S E R V E D P R O C E D U R E



- The recycling firms in Bangalore often collect the salvagable parts of the scrap from the landfills
- The steel frames will be collected, shredded into smaller pieces, melted in a furnace, purified to remove impurities, and then cast into new products or raw materials for manufacturing.
- foam can be used in carpet underlay, padding, or other cushioning products
- Depending on the type, the fabric can be recycled into new textile products or repurposed for other uses
- The shredded plastic will be melted and molded into new plastic products.



INFERENCES

FROM SSP ENTERPRISES

- All parts are outsourced to facilitate **rapid production**, reducing assembly time to **1.5 hours** per chair.
- Components are standardised parts, and **sourced locally**, primarily from vendors located in Mysore Road 10km away, with lead times ranging from **2 hours** (for foam, fabric, fasteners) to **1 week** (for plywood).
- The chair is priced at **₹1600**.
- SSP Enterprises focuses on **B2B and B2G** clients, especially through **government tenders**.
- Chairs are made on order only, due to space restrictions of having a unit in the city.



MR. NATESH
Incharge - Assembly



INFERENCES

FROM SSP ENTERPRISES

