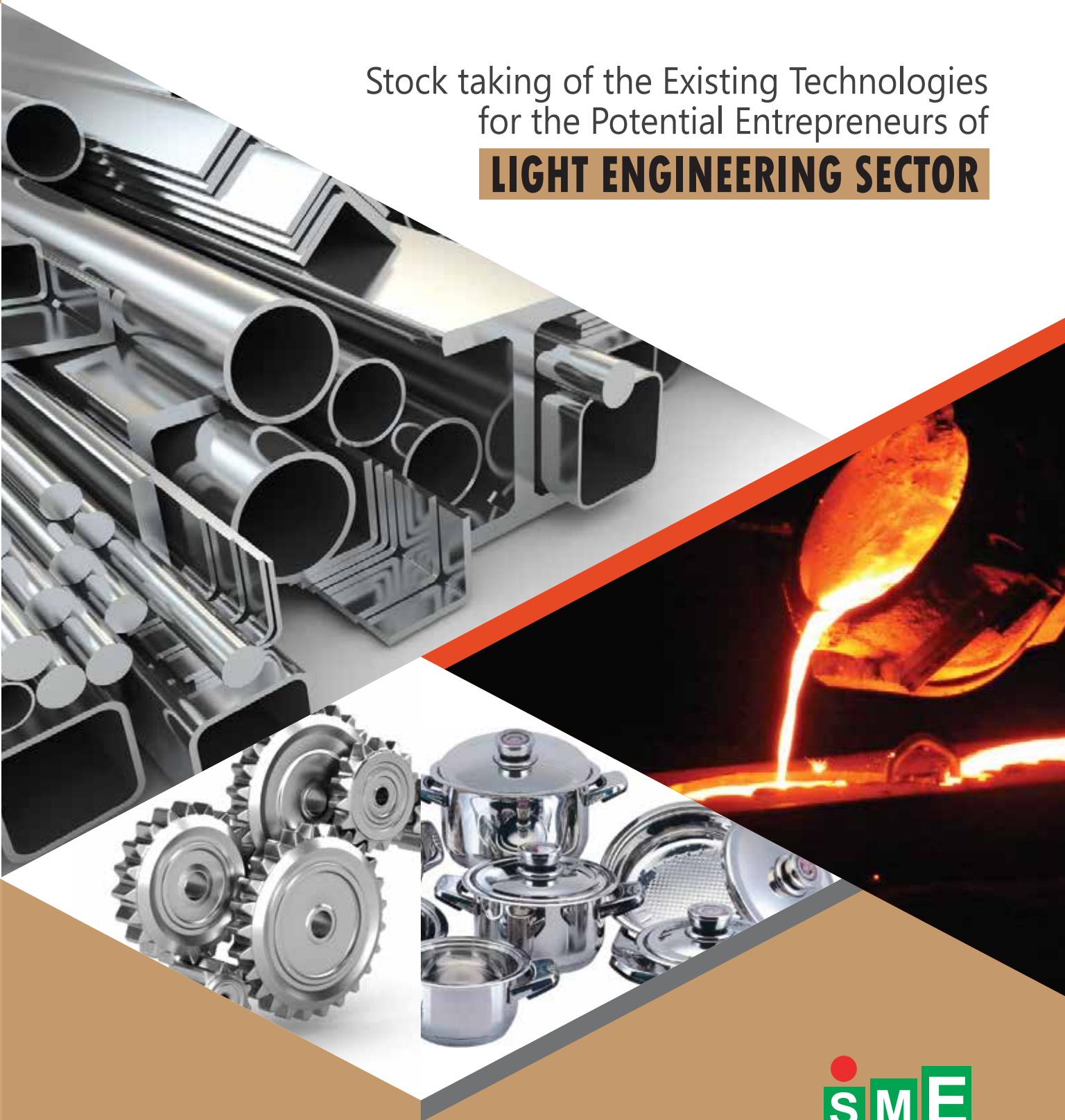


Stock taking of the Existing Technologies
for the Potential Entrepreneurs of

LIGHT ENGINEERING SECTOR



Stock Taking of Existing Technologies for the Potential Entrepreneurs of Light Engineering Sector

April 2018



Small & Medium Enterprise Foundation

Royal Tower, 4 Panthapath, Dhaka-1215, Bangladesh

Phone +8802 8142983, 9142907 Fax: +88028142467

E-mail: info@smef.org.bd, Website: www.smef.org.bd

Stock Taking of Existing Technologies for the Potential Entrepreneurs of Light Engineering Sector

Advisor

Md. Safiqul Islam
Managing Director, SME Foundation.

Editor

SM Shaheen Anwar
Deputy Managing Director, SME Foundation.

Co-editor

Md. Tanvir Faisal
Assistant Manager, SME Foundation and
Manjur Morshed Rakib
Assistant Manager, SME Foundation.

Reviewer

Dr. Nafis Ahmad
Professor
Dept. of Industrial & Production Engineering
Bangladesh University of Engineering and Technology.

Cover Design

Md. Monjurul Haque
Assistant Manager, SME Foundation.

Published by:

Small & Medium Enterprise Foundation
Royal Tower, 4 Panthapath,
Kawran Bazar, Dhaka-1215.
Phone: +880-2-8142983, +880-2-9142907, Fax: +880-2-8142467,
E-mail: info@smef.org.bd; Website: www.smef.org.bd

ISBN: 978-984-34-2970-4

Price: BDT 250.

Foreword

Small and Medium Enterprises (SMEs) play a very crucial role in employment creation and overall economic development of any country. Among the formidable barriers encountered by SMEs access to technology is a prominent one. In a developing country like Bangladesh, SMEs have fallen behind in terms of awareness, adoption and adaptation of updated technologies which prominently describes the productivity enhancement and overall competitiveness of the enterprise.

SME Foundation is working as the apex organization in Bangladesh with the aim of promoting the growth of SMEs of manufacturing and service-oriented field of prioritized sectors of national economy declared by the National Industrial Policy 2016. In order to address the growing demands of technical information about prospective products and their production process from new and existing entrepreneurs, the SME Foundation has taken an initiative to develop sector-wise booklets and information stocks containing most basic technical information to develop any product. As a result, four publications from four priority sectors, i.e. i) Light Engineering Sector; ii) Plastic Sector; iii) Agro-Processing Sector and iv) Leather Sector have been prepared.

The sole purpose of this document is to facilitate entrepreneurs and/or potential investors by providing them with a general understanding of the prospective products, raw materials, required technology, necessary machineries, probable investment costs and broad description of sourcing ideas.

SM Shaheen Anwar
Deputy Managing Director
SME Foundation

Disclaimer

The information presented in this publication provides only a generic collection of ideas on the selected subject. The data were collected from various reliable sources based on certain assumptions and may differ from case to case in real life situations. There is limited warranty on the correctness of the collected data/ information whence the publication has been faithfully reviewed by the expert on relevant subject matter. SME Foundation and its employees do not assume any liabilities resulting from any decision taken based on this document. The prospective users of this document are encouraged to undertake detail investigation, accumulate necessary information and consult professionals/ technical experts prior to taking any decisive action.

Acronym

A	Ampere
APPROX	Approximately
ASM	American Society for Metals.
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
AVG	Average
BCPC	Bangladesh Central Product Classification
BDS	Bangladesh Standard
BEIOA	Bangladesh Engineering Industry Owners' Association
BITAC	Bangladesh Industrial & Technical Assistance Center
BSIC	Bangladesh Standard Industrial Classification
BSTI	Bangladesh Standards and Testing Institution
CAD	Computer Aided Design
DIA	Diameter
FOB	Free on Board
HS	Harmonized System
Hz	Hertz
ISO	International Organization for Standardization
kW	Kilo Watt
LEI	Light Engineering Industry
LEPBPC	Light Engineering Product Business Promotion Council
LES	Light Engineering Sector
MAX	Maximum
MIN	Minimum or Minute
MM	Millimeter
MPA	Megapascal
MS	Mild Steel
NOS	Numbers
OD	Outer Diameter
PCS	Pieces
PSI	Pounds Per Square Inch
RPM	Revolution Per Minute
SME	Small and Medium Enterprise
SMEF	Small and Medium Enterprise Foundation
SS	Stainless Steel

Table of Contents

1. Foreword.....	iii
2. Disclaimer.....	iv
3. Acronym.....	v
4. Introduction: Light Engineering Sector of Bangladesh.....	vii
5. Product-01: Thresher.....	1
6. Product-02: Hand Pump.....	4
7. Product-03: Centrifugal Pump.....	8
8. Product-04: Cylinder Liner.....	12
9. Product-05: Bolt & Nut.....	16
10. Product-06: Engine Hoist.....	21
11. Product-07: Exhaust Silencer (Absorptive).....	24
12. Product-08: Telescopic Prop.....	29
13. Product-09: Wheelbarrow.....	33
14. Product-10: Window Grill.....	36
15. Product-11: Sheet Metal Door.....	39
16. Product-12: Saucepan.....	43
17. Product-13: Display Counter.....	47
18. Product-14: Baking Oven.....	51
19. Product-15: Spiral Mixer.....	55
20. Product-16: Dough Sheeter.....	59
21. Product-17: Hand Sieve.....	62
22. Product-18: Cylinder Trolley.....	66
23. Product-19: Hospital Bed.....	70
24. Product-20: File Cabinet.....	74
25. Product-21: Tweezer.....	78
26. Product-22: Wrench.....	81
27. Product-23: Mold.....	86
28. Product-24: Fish Plate.....	90
29. Product-25: Brake Block.....	93
30. Annex-1: List of Products under Mandatory Certification Marks Scheme.....	i
31. Annex-2: Glossary of Engineering Terminology.....	vi

Introduction: Light Engineering Sector of Bangladesh

The history of mining and metalworking span across cultures, civilizations, millennia and dates to 8700 BC as the oldest archaeological evidence suggests ^[1]. Because of technological advancement and socio-economic transformations in European countries in 18th century manufacturing industries came into being.

The era of engineering industry in Bangladesh was introduced by few Bengali labor force working in non-Bengali firms producing mostly railway spare parts ^[2]. Today the Light Engineering Sector (LES) produces a total 3,815 types of quality machinery, spares and accessories, as well as provides repairing services. Almost 90% of the industries of LES addresses local needs and thus manufacture a significant amount of import substitute products ^[3]. A joint study of International Finance Corporation (IFC), UK Department for International Development (DFID) and Norwegian government finds 0.6 Million people working in 50,000 Micro Enterprises and 10,000 Small and Medium Enterprises (SMEs) ^[4].

The annual turnover of LES is approximately Taka 12,800 Crore and among which Taka 1,600 Crore account for import substitute products. The government of Bangladesh is providing 10% cash incentive on export of LES products ^[5].

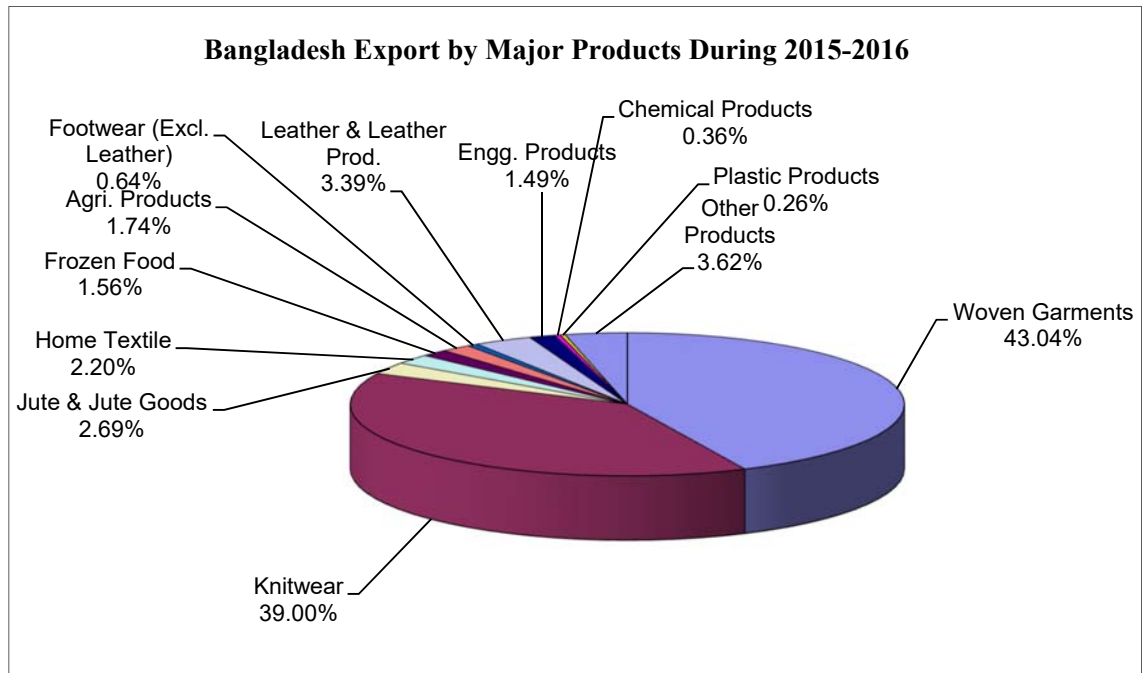


Figure i: Share of plastic products in annual export of Bangladesh during 2015-16 ^[4].

The above figure states the share (1.49%) of engineering products in annual export of Bangladesh during fiscal year 2015-16. The amount is about US Dollar 510 million out of total export of US Dollar 34.24 billion.

The export of engineering products has seen steady increase in recent years. It is evident from available data that it has recovered from a depression during 2008-09 fiscal year to current state.

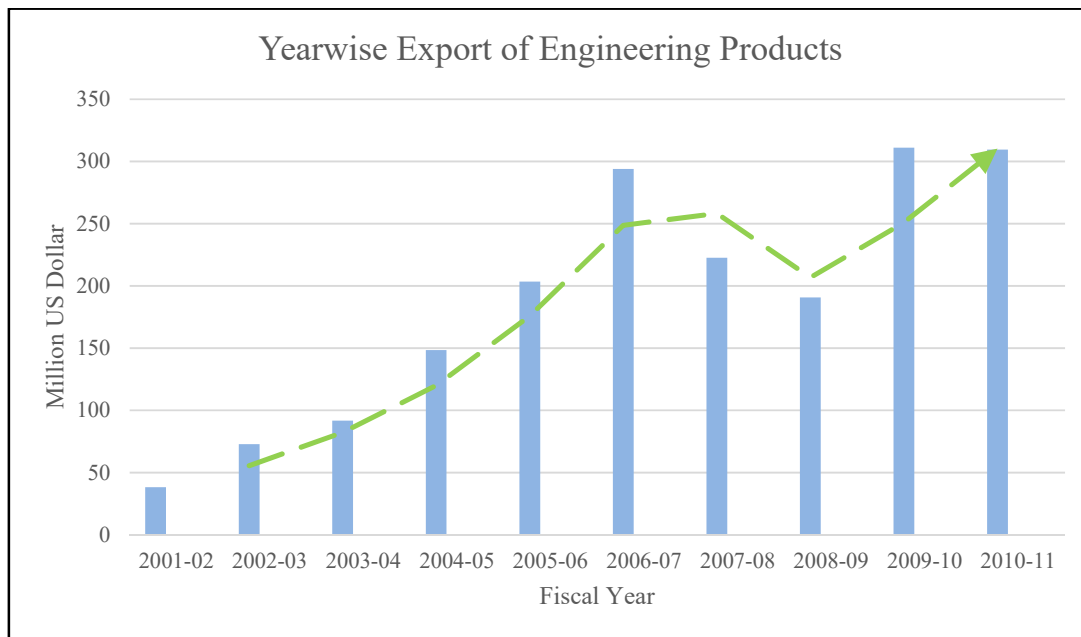


Figure ii: Annual export of engineering products from 2001-02 to 2010-11 ^[6].

References:

1. Hesse, Rayner, W. (2007). 'Jewelrymaking through History: an Encyclopedia'. Greenwood Publishing Group. p. 56.
2. Ahmed, N., Bakht, Z., 'Light Engineering Industry in Bangladesh: A Case Study'. Bangladesh Institute of Development Studies, June 2010.
3. 'An abridged overview of Bangladesh Light Engineering Product Sector', http://www.bpc.org.bd/lepbbc_bridge_overview.php, Dated: 3 April 2018, 11:00am.
4. 'Current Status of Light Engineering Sector in Bangladesh', http://www.bpc.org.bd/lepbbc_current_sector_profile.php, Dated: 3 April 2018, 11:05am.
5. 'Light Engineering Sector', <http://bida.gov.bd/light-engineering-sector>, Dated: 3 April 2018, 11:30am.
6. 'Export Scenario of Light Engineering Product Sector', http://www.bpc.org.bd/lepbbc_export.php, Dated: 3 April 2018, 11:35am.

Stock Taking of Existing Technologies
for the
Potential Entrepreneurs

of

‘Light Engineering Sector’

Product-01: Thresher															
Sub-sector:	Agricultural Machinery & Equipment														
HS-2007:	8433.52.00	BSIC-2009:	2821												
		BCPC-2011:	44129												
Description:	A Threshing Machine or Thresher is a farm equipment that threshes food grains, that is it removes the seeds from the stalks and husks.														
Product:															
Component:	1. Chassis	2. Body/ Shell	3. Threshing Unit												
Raw Materials:	<table border="1"> <tr> <td rowspan="2">Base Raw Material:</td> <td>• MS Rectangular Tube (100mm x 50mm; 3mm thick)</td> <td>• MS Angle (40mm x 40mm; 3mm thick)</td> </tr> <tr> <td>• MS Wire/ Rod (5mm dia.)</td> <td>• MS Sheet (2mm thick)</td> </tr> <tr> <td rowspan="2">Accessories:</td> <td>• Bolt and Nut</td> <td>• Gear and Shaft</td> <td>• Pulley and Belt</td> </tr> <tr> <td>• Bearing and Seal</td> <td>• Wheel and Axle</td> <td></td> </tr> </table>			Base Raw Material:	• MS Rectangular Tube (100mm x 50mm; 3mm thick)	• MS Angle (40mm x 40mm; 3mm thick)	• MS Wire/ Rod (5mm dia.)	• MS Sheet (2mm thick)	Accessories:	• Bolt and Nut	• Gear and Shaft	• Pulley and Belt	• Bearing and Seal	• Wheel and Axle	
Base Raw Material:	• MS Rectangular Tube (100mm x 50mm; 3mm thick)	• MS Angle (40mm x 40mm; 3mm thick)													
	• MS Wire/ Rod (5mm dia.)	• MS Sheet (2mm thick)													
Accessories:	• Bolt and Nut	• Gear and Shaft	• Pulley and Belt												
	• Bearing and Seal	• Wheel and Axle													
Raw Material Supplier:	<ul style="list-style-type: none"> • Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. • Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 														
Machineries, Equipment and Specification:	1. Compound Miter Saw (Circular Saw)														
	<ul style="list-style-type: none"> • Blade: 254 mm O.D.; 25.4 mm Bore; Carbide • Speed: ~ 2,000 rpm • Miter Range: 45 Degree (Left & Right) • Bevel Range: 45 Degree (Left & Right) • Power: ~ 1.8 kW (220V, 1 Phase, 50 Hz) • Dimension (LxWxH): ~ 0.7m x 0.5m x 0.6m • FOB Price: USD 300 – 450 (New) • Gross Weight: ~25 kg 														

2. Hydraulic Shearing Machine



- Front Gauge Length: ~ 1,000 mm
- Back Gauge Length: ~ 500 mm
- Shear Length: ~ 1,000 – 1,200 mm
- Blade Angle: ~ 0 – 5 Degree (Adjustable)
- Sheet Thickness (MS/SS): Max. 5/3 mm
- Stroke Rate: ~ 10 – 25 per minute
- Power: ~ 15 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~2m x 1.2m x 1.5m
- FOB Price: USD 10,000 – 20,000 (New)
- Gross Weight: ~ 5 ton

3. Roll Bending Machine



- Working Length: ~ 1,000 – 1,200 mm
- Sheet Thickness (MS/SS): Max. 5/3 mm
- Bending Diameter: Min. 150 mm
- Roll Size: ~ 100 mm Dia., Solid, 3-piece.
- Power: ~ 12 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWx H): ~2m x 0.8m x 1.1m
- FOB Price: USD 500-1,500 (New)
- Gross Weight: ~ 1.5 ton

4. Wire Bending Machine



- Wire Diameter Range: 2 – 10 mm
- Wire UTS Range: Max. 500 MPa
- Bending Angle: 0 – 180 Degree
- Bending Speed: 72 Degree/Second
- Power: ~ 5 kW (220V, 1 Phase, 50 Hz)
- Dimension (LxWxH): ~ 1m x 0.7m x 1m
- Optional Feature: Cutting
- FOB Price: USD 800 – 1,200 (New)
- Gross Weight: ~ 0.4 ton

5. Multi-Process Welding Machine

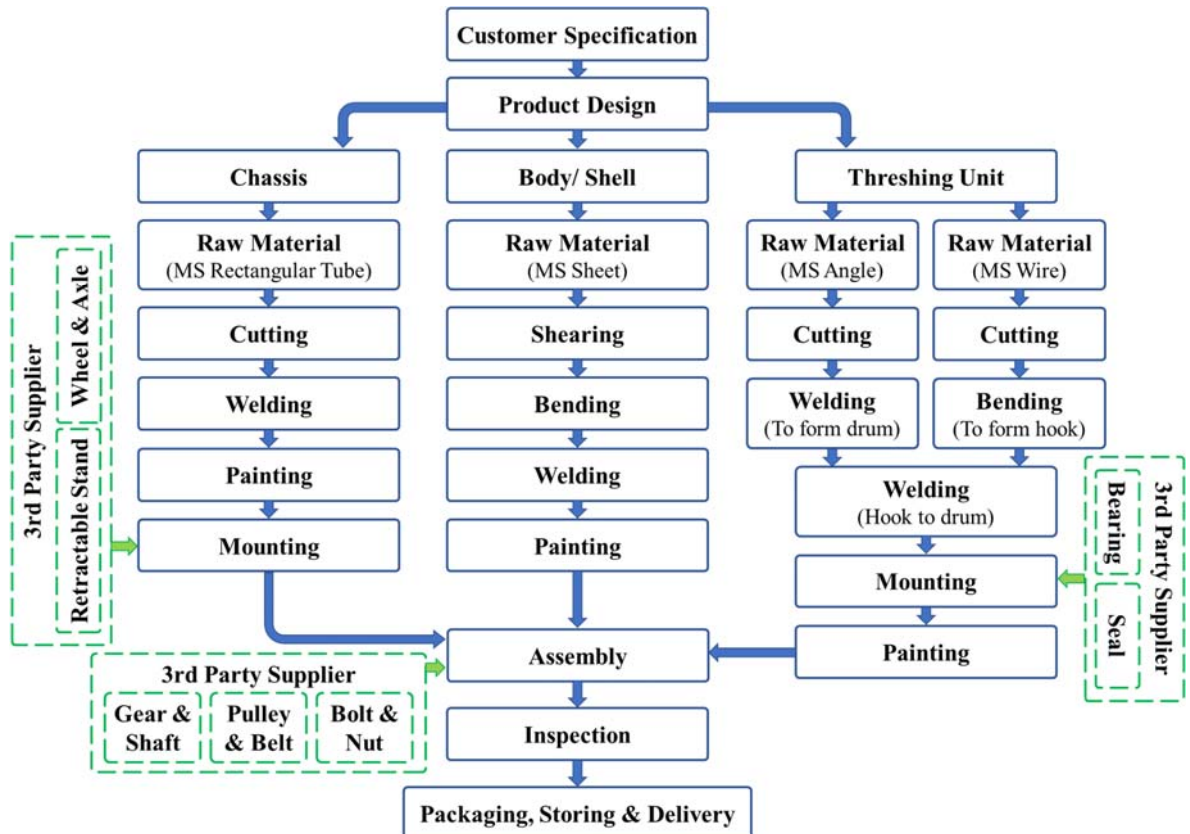


- Process: Stick (MMAW), L-TIG (GTAW)
- Power: ~ 5 kW (220V, 1 Phase, 50 Hz)
- Effective Input Current: ~ 10 – 15 A
- OCV (MMAW/GTAW): 80/15 V DC
- Output Current: 5 – 150 A
- Duty Cycle (40°C, 10 min): Adjustable
- Electrode (MMAW): E6010-13; 1.6- 4mm
- Dimension (LxWxH): 0.2m x 0.4m x 0.5m
- FOB Price: USD 600 – 1,000 (New)
- Gross Weight: ~ 25 kg

Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Production Process Flow Chart:



Bibliography:

- Boljanovic, Vukota, "Metal Shaping Processes", Industrial Press Inc., 2009.
- Banabic, Dorel, "Sheet Metal Forming Processes", Springer-Verlag Berlin Heidelberg, 2010.
- Mielnik, Edward M., "Metalworking Science and Engineering", McGraw-Hill, 1991.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Flood, C.R., "Fabrication Welding and Metal Joining Processes", Butterworth-Heinemann Ltd., 1981.
- John, K. C., "Metal Casting & Joining", Prentice-Hall (India) Pvt. Ltd., 2015.

Product-02: Hand Pump				
Sub-sector:	Agricultural Machinery & Equipment			
HS-2007:	8413.20.00	BSIC-2009:	2813	BCPC-2011: 43220
Description: A Hand Pump is an equipment that lifts water from shallow depths beneath the surface.				
Product:				
Component:	1. Body/ Cylinder	2. Lid & Lever	3. Piston & Piston Rod	
Raw Materials:				
Base Raw Material:	• Pig Iron and Steel Scrap		• Coke (Petroleum/ Metallurgical)	
	• Limestone		• Ferro-alloys (FeSi, FeMn, SiMn)	
Accessories:	• Bolt and Nut	• Valve and Seal	• Inoculant & Nodulant	
	• Sand & Binder	• Sand Additives		
Raw Material Supplier:				
<ul style="list-style-type: none"> • Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. • Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. • Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. • Bangladesh Sand Mining & Merchants Association. Chakdah Building, Munshikhola, Chakdah, Shaympur, Dhaka. Tel: +8802-7445755. Mobile: +8801711-532960. 				
Machineries, Equipment and Specification:				
1. Vibratory Sand Sieve/ Sifter Machine				
		<ul style="list-style-type: none"> • Effective Dia.: ~ 1,000 mm • Screen: 1 – 5 nos.; Mesh: 0.025 – 20 mm • Speed: ~ 1200 rpm • Power: ~ 2 kW (220V, 3 Phase, 50 Hz) • Noise Level: ~ 60 – 70 dB • Dimension (LxWxH): ~1.2m x 1.2m x 2m • FOB Price: USD 3,000 – 5,000 (New) • Gross Weight: ~ 500 kg 		

2. Sand Mixer/ Muller Machine



- Batch Capacity: ~ 500 kg
- Output (180 sec cycle): ~ 10 ton/hr
- Pan Size (Dia. xH): ~ 1.7 m x 0.7 m
- Roller Size (Dia. xW): ~0.6m x0.3m, 2 no.
- Door Size (HxW): ~ 0.5m x0.3m
- Drive Motor: ~ 20 HP
- Power: ~ 20 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWx H): ~2m x 1.8m x 3m
- FOB Price: USD 3,500 – 6,000 (New)
- Gross Weight: ~ 3 ton

3. Cupola Furnace



- Construction: MS Plate. 10 mm thick.
- Lining: 130 mm/ Layer, 3 Layers
- Cupola Inner Dia.: ~ 1 m
- Tuyere Area (1:5): ~0.5m, 8 nos./row, 2 row
- Charging Door Size (LxH): ~ 0.6 m x 0.5 m
- Blast Motor Power: ~ 25 HP
- Blast Volume (1:5): ~ 130 cu.m/min
- Melting Rate: ~ 5 ton/ hr
- Dimension (LxWxH): ~ 12m x 3.5m x 3.5m
- FOB Price: USD 25,000 – 40,000 (New)
- Gross Weight: ~ 30 ton

4. Molding Hand Tool Kit



- Type: Hand Tools
- Tools: Rammer, Vent Wire, Trowel, Slick & Spoon, Lifter, Sprue Pin, Swab, Draw Spike, Bellow, Riddle, etc.
- FOB Price: USD 200 – 800 (New)
- Gross Weight: ~ 15 kg

5. Pattern Making Tool Kit



- Type: Woodworking Hand Tools
- Tools: Measuring Tools, Marking Tools, Cutting Tools, Surfacing Tools, Curving Tools, Finishing Tools, etc.
- FOB Price: USD 100 – 600 (New)
- Gross Weight: ~ 20 kg

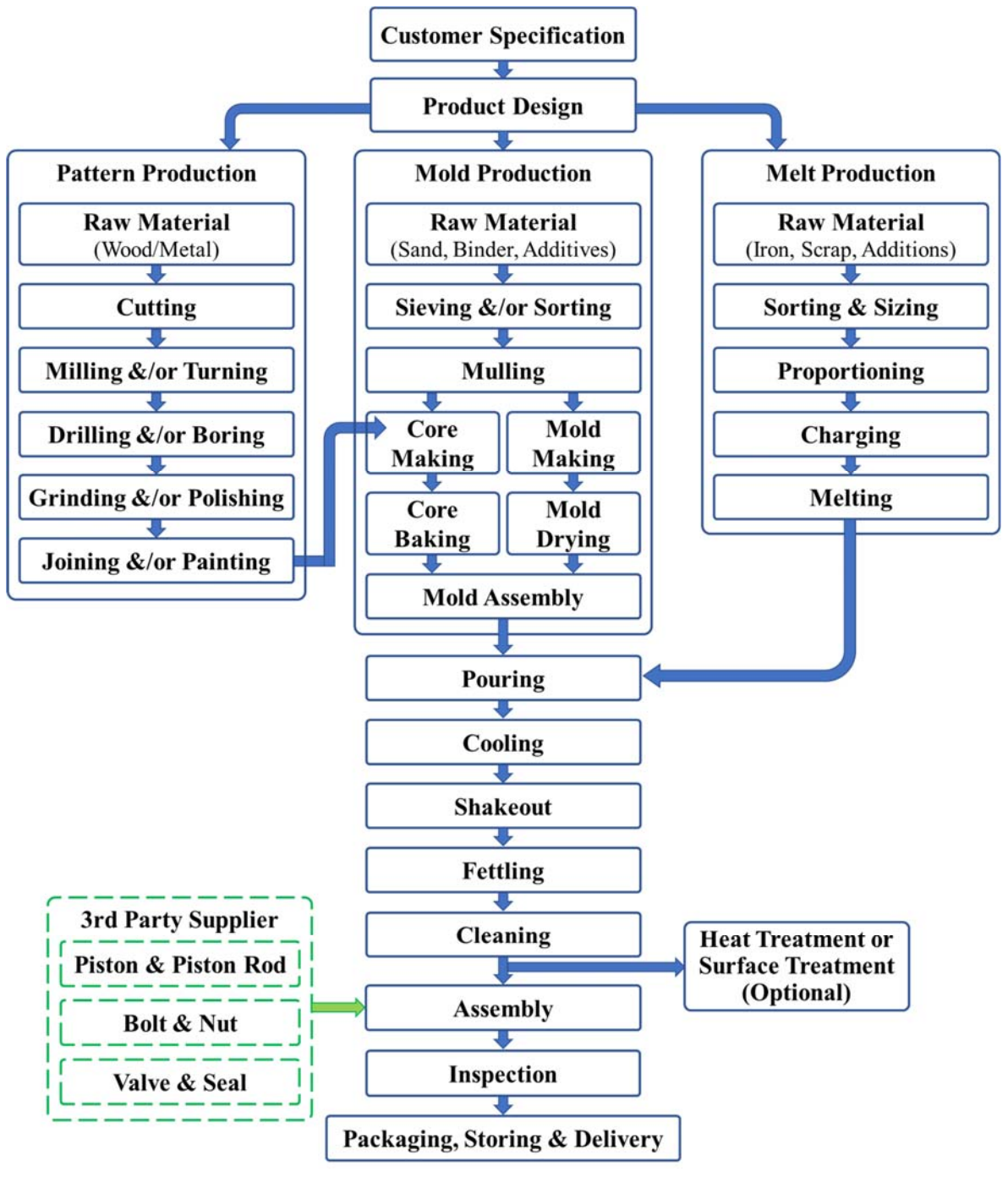
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Campbell, John, "Complete Casting Handbook: Metal Casting Processes, Techniques and Design", 1st Ed., Butterworth-Heinemann, 2011.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- John, K. C., "Metal Casting & Joining", Prentice-Hall (India) Pvt. Ltd., 2015.
- Beeley, Peter, "Foundry Technology", 2nd Ed., Butterworth-Heinemann, 2001.
- Tuttle, Robert B., "Foundry Engineering: The Metallurgy and Design of Castings", Vol. 1, CreateSpace Independent Publishing Platform, 2012.

Production Process Flow Chart:



Product-03: Centrifugal Pump			
Sub-sector:	Agricultural Machinery & Equipment		
HS-2007:	8413.70.00	BSIC-2009:	2813
		BCPC-2011:	43220
Description:	A Centrifugal Pump is an equipment that transports fluid by the conversion of rotational kinetic energy to the hydrodynamic energy of the fluid flow with the help of an engine or motor.		
Product:			
Component:	1. Volute	2. Impeller	3. Housing and Shaft
Raw Materials:			
Base Raw Material:	• Pig Iron and Steel Scrap	• Coke (Petroleum/ Metallurgical)	
	• Limestone	• Ferro-alloys (FeSi, FeMn, SiMn)	
Accessories:	• Bolt and Nut	• Bearing and Seal	• Shaft
	• Sand & Binder	• Sand Additives	• Inoculant & Nodulant
Raw Material Supplier:			
<ul style="list-style-type: none"> • Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. • Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. • Bangladesh Sand Mining & Merchants Association. Chakdah Building, Munshikhola, Chakdah, Shaympur, Dhaka. Tel: +8802-7445755. Mobile: +8801711-532960. 			
Machineries, Equipment and Specification:			
1. Vibratory Sand Sieve/ Sifter Machine			
		<ul style="list-style-type: none"> • Effective Dia.: ~ 1,200 mm • Screen: 5 nos.; Mesh Size: 0.025 – 20 mm • Speed: ~ 1,000 rpm • Power: ~ 2.5 kW (220V, 3 Phase, 50 Hz) • Noise Level: ~ 75 dB • Dimension (LxWxH): ~1.5m x 1.5m x 2.2m • FOB Price: USD 3,500 – 4,000 (New) • Gross Weight: ~ 500 kg 	

2. Sand Mixer/ Muller Machine



- Batch Capacity: ~ 500 kg
- Output (180 sec cycle): ~ 10 ton/hr
- Pan Size (Dia. xH): ~ 1.7 m x 0.7 m
- Roller Size (Dia. xW): ~0.6m x0.3m, 2 no.
- Door Size (HxW): ~ 0.5m x0.3m
- Drive Motor: ~ 20 HP
- Power: ~ 20 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWx H): ~2m x 1.8m x 3m
- FOB Price: USD 3,500 – 6,000 (New)
- Gross Weight: ~ 2.5 ton

3. Cupola Furnace



- Construction: MS Plate. 10 mm thick.
- Lining: 130 mm/ Layer, 3 Layers
- Cupola Inner Dia.: ~ 1 m
- Tuyere Area (1:5): ~ 0.5m, 8 nos./row, 2 row
- Charging Door Size (LxH): ~ 0.6 m x 0.5 m
- Blast Motor Power: ~ 25 HP
- Blast Volume (1:5): ~ 130 cu.m/min
- Melting Rate: ~ 5 ton/ hr
- Dimension (LxWxH): ~ 12m x 3.5m x 3.5m
- FOB Price: USD 25,000 – 40,000 (New)
- Gross Weight: ~ 30 ton

4. Molding Hand Tool Kit



- Type: Hand Tools
- Tools: Rammer, Vent Wire, Trowel, Slick & Spoon, Lifter, Sprue Pin, Swab, Draw Spike, Bellow, Riddle, etc.
- FOB Price: USD 200 – 800 (New)
- Gross Weight: ~ 15 kg

5. Pattern Making Tool Kit



- Type: Woodworking Hand Tools
- Tools: Measuring Tools, Marking Tools, Cutting Tools, Surfacing Tools, Curving Tools, Finishing Tools, etc.
- FOB Price: USD 100 – 600 (New)
- Gross Weight: ~ 20 kg

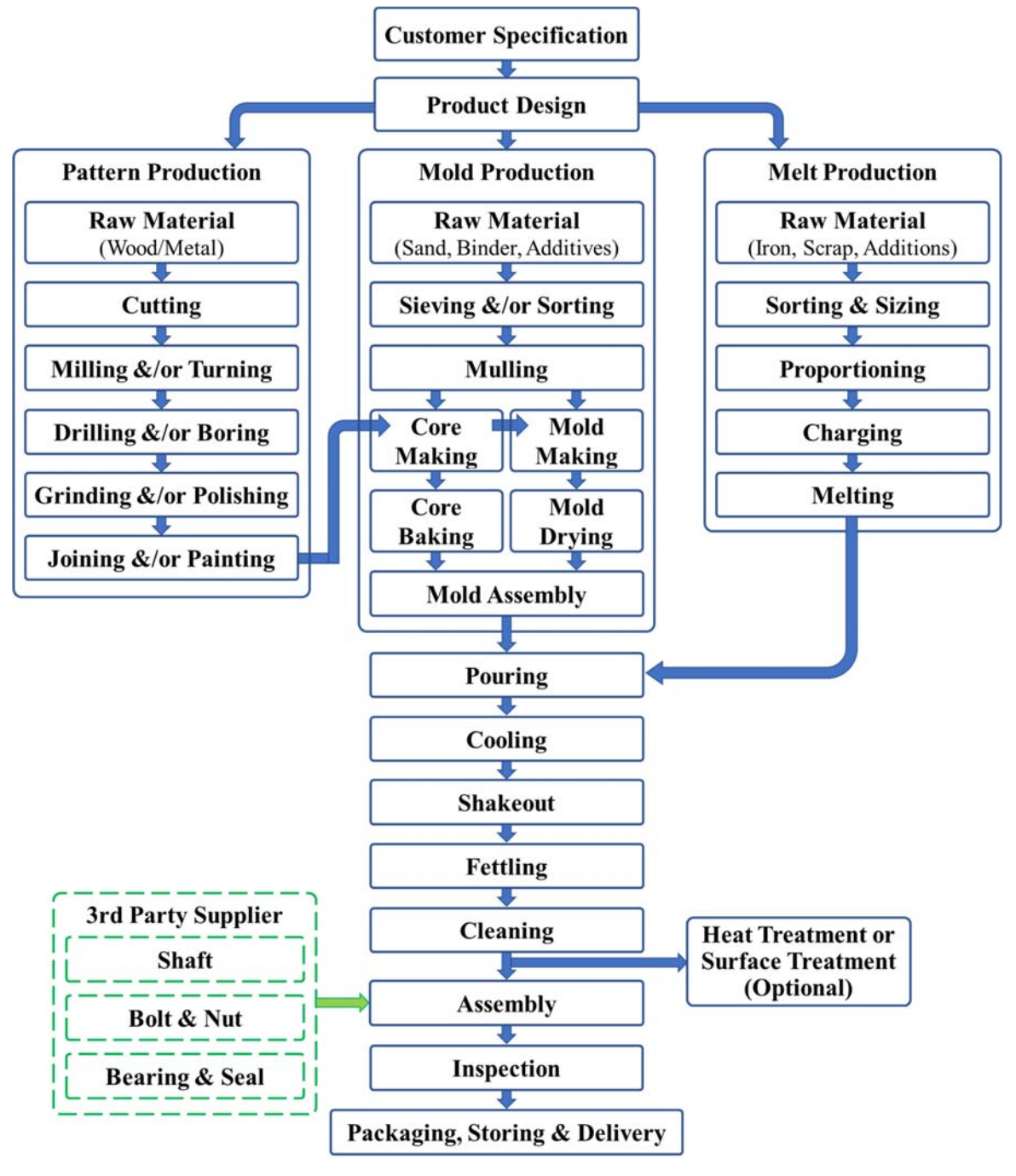
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Campbell, John, "Complete Casting Handbook: Metal Casting Processes, Techniques and Design", 1st Ed., Butterworth-Heinemann, 2011.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Beeley, Peter, "Foundry Technology", 2nd Ed., Butterworth-Heinemann, 2001.
- Tuttle, Robert B., "Foundry Engineering: The Metallurgy and Design of Castings", Vol. 1, CreateSpace Independent Publishing Platform, 2012.

Production Process Flow Chart:



Product-04: Cylinder Liner			
Sub-sector:	Automobile Spares & Equipment		
HS-2007:	8409.99.90	BSIC-2009:	2930
		BCPC-2011:	43151
Description:			
A Cylinder Liner is a cylindrical shell within the engine block inside of which combustion of fuel takes place and moves the piston assembly (piston, rings, connecting rod, etc.) up and down.			
Product:			
Component:	1. Collar	2. Shell	3. Groove/ Jacket
Raw Materials:			
Base Raw Material:	• Pig Iron and Steel Scrap	• Coke Powder	
	• Calcium Oxide	• Ferro-alloys (FeSi, FeMn, SiMn)	
Accessories:	• Sand & Binder	• Sand Additives	• Inoculant & Nodulant
Raw Material Supplier:			
<ul style="list-style-type: none"> • Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. • Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. 			
Machineries, Equipment and Specification:			
1. Cupola Furnace			
		<ul style="list-style-type: none"> • Construction: MS Plate. 10 mm thick. • Lining: 130 mm/ Layer, 3 Layers • Cupola Inner Dia.: ~ 1 m • Tuyere Area (1:5): ~ 0.5m, 8 nos./row, 2 row • Charging Door Size (LxH): ~ 0.6 m x 0.5 m • Blast Motor Power: ~ 25 HP • Blast Volume (1:5): ~ 130 cu.m/min • Melting Rate: ~ 5 ton/ hr • Dimension (LxWxH): ~ 12m x 3.5m x 3.5m • FOB Price: USD 25,000 – 40,000 (New) • Gross Weight: ~ 30 ton 	

2. Horizontal Centrifugal Casting Machine



- Casting Outside Dia.: 50 – 300 mm
- Casting Inside Dia.: 40 – 290 mm
- Casting Length: 100 – 400 mm
- Casting Weight: Max. 50 kg
- Tool Weight: Max. 300 kg
- Speed: ~ 2,500 rpm
- Power: ~ 5 kW (400V, 3 Phase, 50 Hz)
- Option: Preheating, Cleaning, Coating, Pouring, Cooling, Extraction, etc.
- Dimension (LxWxH): ~3m x 3m x 2.5m
- FOB Price: USD 15,000 – 40,000 (New)
- Gross Weight: ~ 5 ton

3. CNC Horizontal Lathe Machine



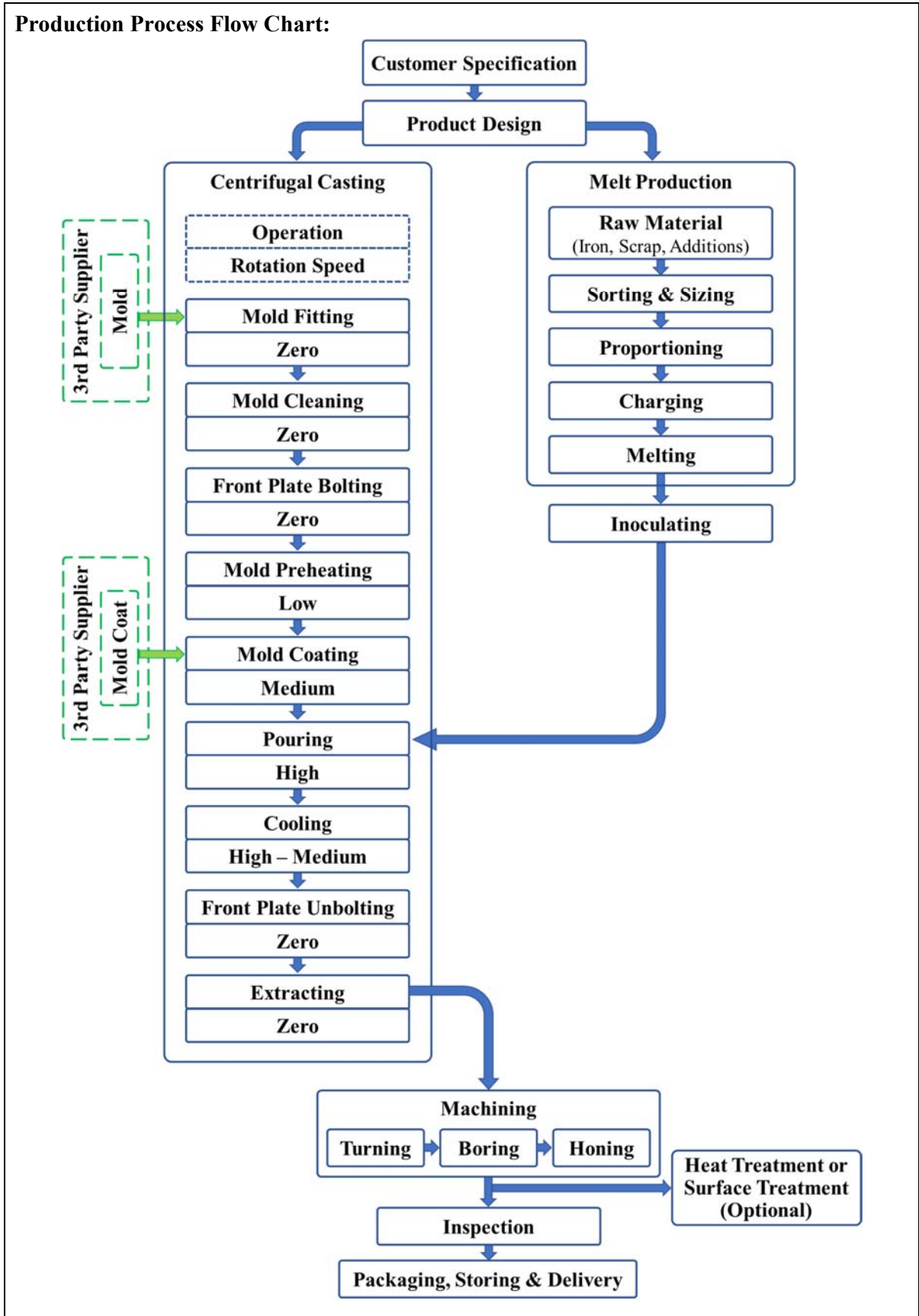
- Swing Over Bed: ~ 550 mm
- Max. Turning Dia.: ~ 350 mm
- Max. Turning Length: ~ 500 mm
- Travel (X, Z): ~ 200mm, ~ 550 mm
- Chuck Size: ~ 8 – 12 in.
- Spindle Speed: ~ 4,000 rpm
- Spindle Bore: ~ 70 mm
- Tool Change Type: Servo
- Tool Stations: 12 nos.
- Speed of Driven Tools: ~ 5,000 rpm
- Power: ~ 20 kW (400V, 3 Phase, 50 Hz)
- Dimensions (LxWxH): ~ 3m x 1.6m x 1.8m
- FOB Price: USD 15,000 – 35,000 (New)
- Gross Weight: ~ 4.5 ton

4. Honing Machine



- Honing Head: 1 nos.
- Max. Honing Depth: ~ 400 mm
- Honing Dia.: 40 – 200 mm
- Honing Spindle Speed: 1 – 400 rpm
- Stroke Spindle Speed: 0 – 40 m/min
- Max. Table Length: 1,500 mm
- Power: ~ 8 kW (400V, 3 Phase, 50 Hz)
- Dimensions (LxWxH): ~ 1.5m x 1m x 2.2m
- FOB Price: USD 5,000 – 12,000 (New)
- Gross Weight: ~ 1.5 ton

Production Process Flow Chart:









Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Campbell, John, "Complete Casting Handbook: Metal Casting Processes, Techniques and Design", 1st Ed., Butterworth-Heinemann, 2011.
- Beeley, Peter, "Foundry Technology", 2nd Ed., Butterworth-Heinemann, 2001.
- Tuttle, Robert B., "Foundry Engineering: The Metallurgy and Design of Castings", Vol. 1, CreateSpace Independent Publishing Platform, 2012.

Product-05: Bolt & Nut			
Sub-sector:	Automobile Spares & Equipment		
HS-2007:	7318.15.00	BSIC-2009:	2599
		BCPC-2011:	42944
Description:			
A Bolt is usually a cylindrical shaft fastener with external male thread and hexagonal head. While a Nut is also a fastener with threaded hole and used in conjunction with bolt.			
Product:			
Component:	1. Head	2. Shank	3. Thread
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> Annealed High Strength Medium Carbon Steel Wire Rod (Dia. 10mm and Dia. 15mm) 		
Accessories:	<ul style="list-style-type: none"> Phosphating Solution 	<ul style="list-style-type: none"> Sulphuric Acid Solution 	
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Metal Wire and Wire-nails Merchant's Association. 12, Imamgonj, Jumman Bepari Plaza, Dhaka. Tel: +8802-7318256, +8802-7310796. Mobile: +8801711-523-105. Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. 			
Machineries, Equipment and Specification:			
1. De-Scaling Tank/ Plant			
		<ul style="list-style-type: none"> Construction: FRP. 10 mm thick. Tank Size (LxWxD): ~ 10m x 2m x 3.5m Agitation Media: Compressed Dry Air Air Consumption: ~ 2 m³/hr (5 bar) Pump Capacity: ~ 500 l/min Power: ~ 5 kW (380V, 3 Phase) Dimension (LxWxH): ~ 11m x 2.5m x 4m FOB Price: USD 10,000 – 12,000 (New) Gross Weight: ~ 5 ton 	

2. Rinsing Tank/ Plant	
	<ul style="list-style-type: none"> • Construction: FRP. 10 mm thick. • Tank Size (LxWxH): ~ 10m x 2m x 3.5m • Agitation Media: Compressed Dry Air • Air Consumption: ~ 2 m³/hr (5 bar) • Pump Capacity: ~ 500 l/min • Power: ~ 5 kW (380V, 3 Phase) • Dimension (LxWxH): ~ 11m x 2.5m x 4m • FOB Price: USD 10,000 – 12,000 (New) • Gross Weight: ~ 5 ton
3. Phosphating Tank/ Plant	
	<ul style="list-style-type: none"> • Construction: FRP. 10 mm thick. • Tank Size (LxWxH): ~ 10m x 2m x 3.5m • Agitation Media: Compressed Dry Air • Air Consumption: ~ 2 m³/hr (5 bar) • Pump Capacity: ~ 500 l/min • Power: ~ 5 kW (380V, 3 Phase) • Dimension (LxWxH): ~ 11m x 2.5m x 4m • FOB Price: USD 10,000 – 12,000 (New) • Gross Weight: ~ 5 ton
4. De-coiler Machine	
	<ul style="list-style-type: none"> • Wire Thickness: 10 – 15 mm • Wire Coil Inner Dia.: ~ 450 – 530 mm • Wire Coil Outer Dia.: ~ 1,200 mm • Wire Coil Weight: Max. 5 ton • Expansion System: Hydraulic • Power: ~ 10 kW (380V, 3 Phase, 50 Hz) • Dimensions (LxWxH): ~ 1.5m x 1m x 2.2m • FOB Price: USD 4,500 – 8,000 (New) • Gross Weight: ~ 1.5 ton
5. Straightening and Cutting Machine	
	<ul style="list-style-type: none"> • Straightening Dia.: 4 – 15 mm (500 MPa) • Straightening Rolls: 8 pcs • Straightening Speed: ~ 75 m/min • Cut-to-Length: ~ 50 – 500 mm • Cutter Type” Rotary Shear • Power: ~ 12 kW (380V, 3 Phase, 50 Hz) • Dimensions (LxWxH): ~ 3m x 1m x 1.5m • FOB Price: USD 2,000 – 5,000 (New) • Gross Weight: ~ 0.8 ton

6. Cold Forging Machine/ Progressive Header Machine



- Forging Station: 5 nos.
- Forging Force: ~ 550 ton
- Wire Size: Min. Dia. 8 mm x Length 50 mm
- Normal Bolt Size: 24 – 30 mm
- Shank Length of Blank: 100 – 350 mm
- Forming Speed: ~ 25 – 45 pcs/min
- Power: ~ 120 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 10m x 4.5m x 5m
- FOB Price: USD 50,000 – 85,000 (New)
- Gross Weight: ~ 150 ton

7. Threading Machine



- Diameter of Thread: ~ 10 – 38 mm
- Length of Thread: Max. 150 mm
- Length of Thread Rod: Max. 300 mm
- Forming Speed: ~ 25- 35 pcs/min
- Threading Die Size: 0.48m x 0.55m x 0.06m
- Power: ~ 75 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 5m x 2.5m x 3m
- FOB Price: USD 25,000 – 35,000 (New)
- Gross Weight: ~ 23 ton

8. Nut Forming Machine



- Forging Station: 6 nos.
- Across Flats of Nut: 14 – 22 mm
- Suitable Hex Nut: M8-M14
- Cut-off Dia.: Max. 20 mm
- Cut-off Length: Max. 15 mm
- Dies Pitch: ~ 80 mm
- Forging Force: ~ 130 ton
- Forming Speed: 60 – 120 pcs/min
- Power: ~ 35 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 4m x 2.5m x 1.5m
- FOB Price: USD 20,000 – 35,000 (New)
- Gross Weight: ~ 15 ton

9. Heat Treatment Furnace



- Heating System: Modulating Gas Burner
- Conveyor Type: Stainless Steel Wire Mesh
- Conveyor Width: ~ 2 m
- Chamber Size (Lx H): ~ 15m x 2m
- Operating Temperature: ~ 1,200 °C
- Output: ~ 500 kg/hr
- Power: ~ 12 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 16m x 3.5m x 5m
- FOB Price: USD 20,000 – 45,000 (New)
- Gross Weight: ~ 8 ton

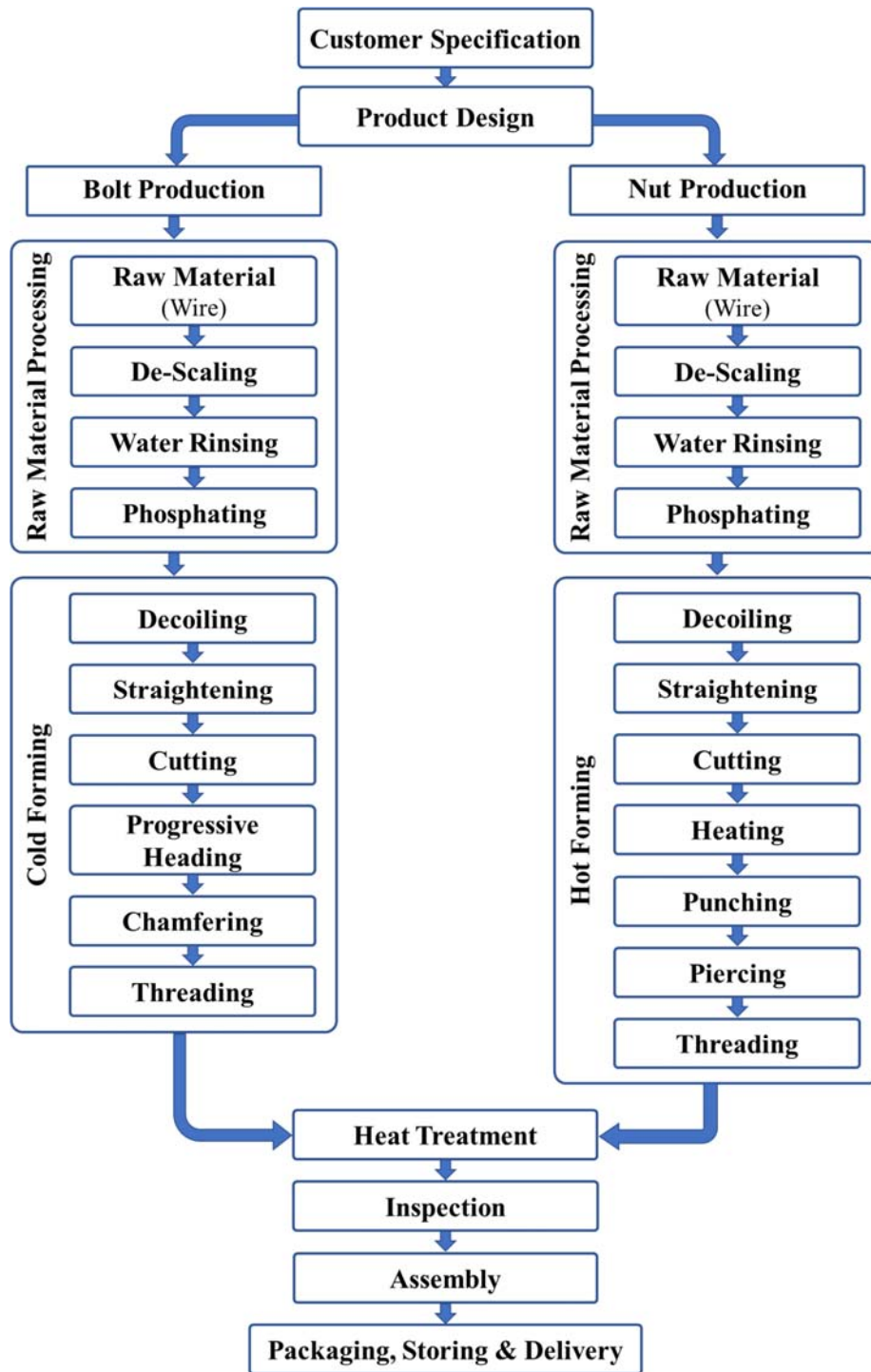
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Boljanovic, Vukota, "Metal Shaping Processes", Industrial Press Inc., 2009.

Production Process Flow Chart:



Product-06: Engine Hoist			
Sub-sector:	Automobile Spares & Equipment		
HS-2007:	8425.42.00	BSIC-2009:	2816
		BCPC-2011:	43510
Description:			
An Engine hoist is a hydraulic lifting equipment used to safely lift, lower and transport automobile car engines and/or other items.			
Product:			
Component:	1. Frame	2. Extendable Legs	3. Boom
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Square Tube (50mm x 50mm; 2.5mm thick) 	<ul style="list-style-type: none"> MS Square Tube (45mm x 45mm; 2.5mm thick) 	
Accessories:	<ul style="list-style-type: none"> Chain and Hook Hydraulic Jack with Handle (8-ton capacity) 	<ul style="list-style-type: none"> Bolt, Nut and R-Pin 	<ul style="list-style-type: none"> Swivel Wheel Set
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 			
Machineries, Equipment and Specification:			
1. Compound Miter Saw (Circular Saw)			
		<ul style="list-style-type: none"> Blade: 254 mm O.D.; 25.4 mm Bore; Carbide Speed: ~ 2,500 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Miter Detent Stops: 5 Degree (All Axis) Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.8m x 0.5m x 0.4m FOB Price: USD 350 – 500 (New) Gross Weight: ~22 kg 	

2. Manual Metal Arc (MMA) Welding Machine



- Effective Input Current: ~ 10 – 20 A
- No Load Voltage: 48 V DC
- Output Current: 60 – 250 A
- Duty Cycle (40°C, 10 min): Adjustable
- Acceptable Electrode: E6010-13; 2- 4mm
- Power: ~ 5 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 0.5m x0.3m x0.4m
- FOB Price: USD 600 – 1,000 (New)
- Gross Weight: ~ 25 kg

3. Pillar Drill Machine



- Drilling Depth: ~ 250 mm
- Chuck Capacity: 13 mm
- Spindle Taper: MT2 / MT3 / MT4
- Spindle Speed: 90 – 2,500 (8 Steps)
- Feed Range: ~ 0.5 mm/rev
- Table Size (LxW): 200mm x 200mm
- Power: ~ 2.5 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 0.3m x 0.8m x 1m
- FOB Price: USD 200 – 350 (New)
- Gross Weight: ~ 50 kg

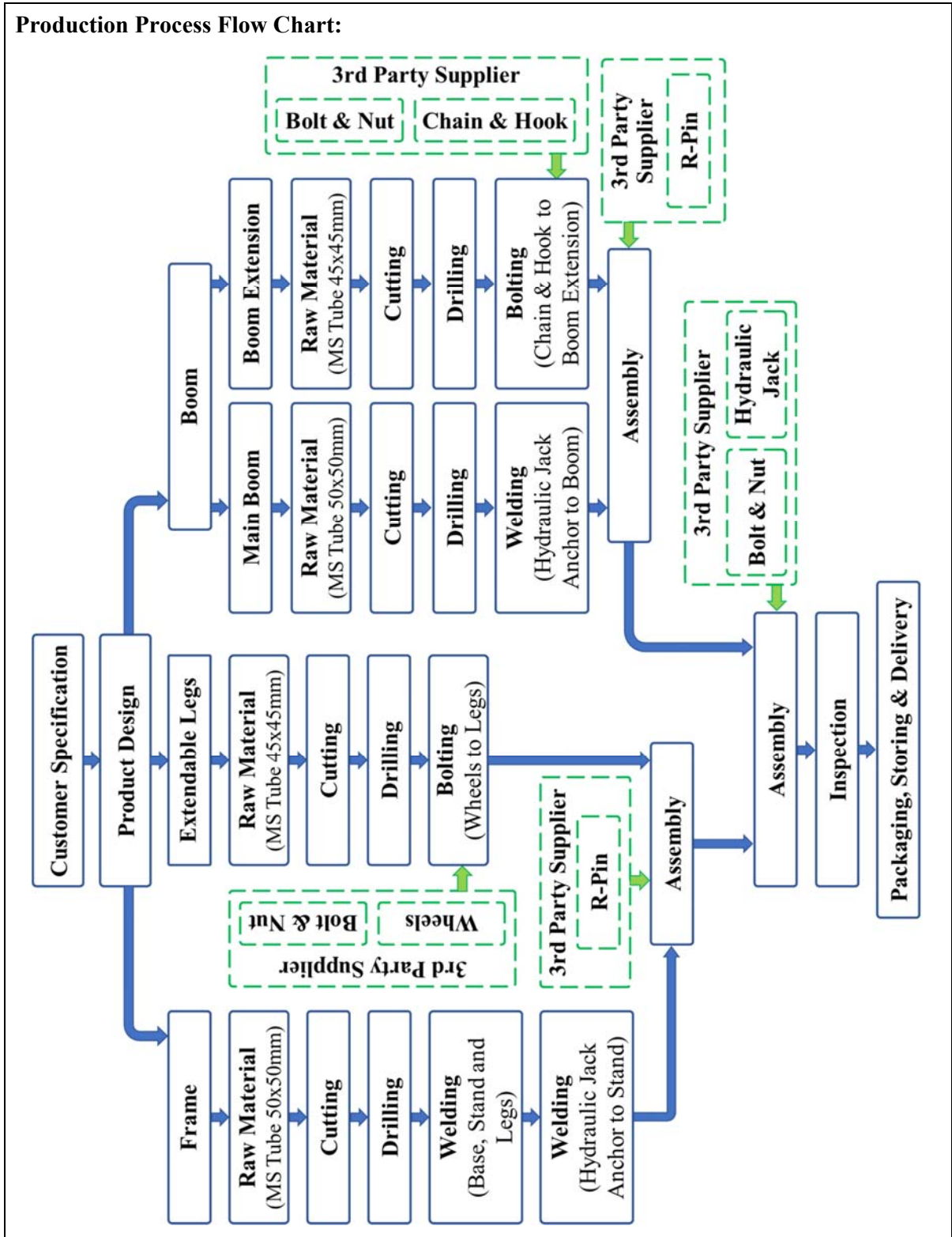
Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Boljanovic, Vukota, "Metal Shaping Processes", Industrial Press Inc., 2009.

Production Process Flow Chart:



Product-07: Exhaust Silencer (Absorptive)

Sub-sector: Automobile Spares & Equipment

HS-2007: 8708.92.00 **BSIC-2009:** 2930 **BCPC-2011:** 49129

Description:
A Silencer/ Muffler is a component of the exhaust system of a vehicle which is used to reduce the sound of engine detonations. It is of two types: i) absorptive/dissipative and ii) reactive/reflective.



Component: 1. Shell 2. End Caps 3. Tube 4. Packing

Raw Materials:

Base Raw Material:	<ul style="list-style-type: none"> SS Sheet (18 Gauge/ 1.25 mm) 	<ul style="list-style-type: none"> SS Round Tube (18 Gauge, 50mm O.D.) 	
Accessories:	<ul style="list-style-type: none"> Steel Wool 	<ul style="list-style-type: none"> Glass Wool 	<ul style="list-style-type: none"> Steel Wire (22 gauge)

Raw Material Supplier:

- Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677.
- Ansha Insulation Museum. Shop: C-5 (2nd Floor), Jabin Tower, 234-235, 236C Nawabpur Road, Dhaka-1100. Mobile: +8801725-265-554, +8801816-255-324.

Machineries, Equipment and Specification:

1. Double Head Decoiler - Coiler Machine

	<ul style="list-style-type: none"> Stations: 2 nos. (1 Decoiler, 1 Coiler) Sheet Thickness: 0.5 – 2 mm Sheet Coil Inner Dia.: ~ 500 mm Sheet Coil Outer Dia.: ~ 1,500 mm Sheet Coil Weight: Max. 5 ton Expansion System: Hydraulic Power: ~ 8 kW (380V, 3 Phase) Dimensions (LxWxH): ~ 1.5m x 1m x 2.2m FOB Price: USD 8,000 – 10,000 (New) Gross Weight: ~ 2 ton
--	---

2. Mechanical/ Hydraulic Punch Press



- Nominal Force: 100 ton
- Stroke Length: 60 – 100 mm
- Stroke Rate: ~ 50 strokes/min
- Die Height: Max. 300 mm
- Workable Area: ~ 550 mm x 800 mm
- Ram Size: ~ 350 mm x 450 mm
- Ram Hole Size: Dia. 50 mm, Depth 100 mm
- Bed Hole Size: Dia. 200 mm, Depth 100 mm
- Power: ~ 10 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2m x 1.5m x 2.5m
- FOB Price: USD 15,000 – 20,000 (New)
- Gross Weight: ~ 6 ton

3. Hydraulic Sheet Shearing Machine



- Back Gauge Length: ~ 600 mm
- Shear Length: Max. 1,300 mm
- Blade Angle Adjustment: 0.5 – 3 Degrees
- Blade Gap Adjustment: 5 – 20 mm, Manual
- Shearing Thickness (SS): Max. 4.5 mm
- Power: ~ 8 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2m x 1.5m x 1.6m
- FOB Price: USD 12,000 – 15,000 (New)
- Gross Weight: ~ 3 ton

4. Shell Forming and Lock Seaming Machine



- Muffler Shape: Round/ Oval/ Rectangle
- Material Thickness:
 - Carbon Steel: 0.8 – 2 mm
 - Stainless Steel: 0.8 – 1.5 mm
- Shell Cross Section:
 - Round: Dia. 90 – 400 mm
 - Oval: Max. 300 mm x 400 mm
 - Rectangular: Max. 300 mm x 400 mm
- Shell Body Length: 250 – 1000 mm
- Shell Layer: Single/ Double
- Seam Rollforming Stations: Max. 9 nos.
- Profile Height: Max. 20 mm
- Seam Forming Speed: ~ 15 m/min
- Power: ~ 15 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 5m x 3m x 3m
- FOB Price: USD 20,000 – 35,000 (New)
- Gross Weight: ~ 5 ton

5. Horizontal Shell Double Flanging Machine



- No. of Forming Station: 2 nos.
- Shell Body Length: 250 – 1000 mm
- Shell Cross Section:
 - Round: Dia. 90 – 400 mm
 - Oval: Max. 300 mm x 400 mm
 - Rectangular: Max. 300 mm x 400 mm
- Shell Layer: Single/ Double
- Shell Material Thickness:
 - Carbon Steel: 0.8 – 2 mm
 - Stainless Steel: 0.8 – 1.5 mm
- Flanging Method: Rotary Rolling/Oscillation
- Power: ~ 12 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3m x 2.5m x 2.5m
- FOB Price: USD 12,000 – 18,000 (New)
- Gross Weight: ~ 3 ton

6. Band Saw Machine



- Blade Size (LxW): ~ 2,500 mm x 20 mm
- Blade Thickness: 0.75 mm
- Blade Speed: 80/130/180/230 rpm
- Cutting Range (@ 90 Degree):
 - Circular: Max. Dia. 180 mm
 - Rectangular: Max. 180 mm x 300 mm
- Cutting Range (@ 45 Degree):
 - Circular: Max. Dia. 125 mm
 - Rectangular: Max. 120 mm x 150 mm
- Power: ~ 5 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 1.8m x 0.8m x 1.5m
- FOB Price: USD 3,000 – 5,000 (New)
- Gross Weight: ~ 0.8 ton

7. Tube Perforating/ Louvering Machine



- Tube Dia.: 20 – 100 mm
- Tube Length: 100 – 700 mm
- Tube Wall Thickness: 0.5 – 3 mm
- Hole Size: Dia. 2 – 8 mm
- Punching Speed: 2,000 – 6,000 Holes/min
- Punch Stroke Length: 6 mm
- Perforating Zones: Max. 5 nos.
- No. of Punch in Punch Head: Max. 8 nos.
- Power: ~ 8 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 1.5m x 0.8m x 1.3m
- FOB Price: USD 12,000 – 18,000 (New)
- Gross Weight: ~ 1.5 ton

8. Vertical Double End Flanging/ Spinning Machine



- No. of Forming Station: 2 nos.
- Shell Body Length: 250 – 1000 mm
- Shell Layer: Single/ Double
- Shell Material Thickness:
 - Carbon Steel: 0.8 – 2 mm
 - Stainless Steel: 0.8 – 1.5 mm
- End Cap Material Thickness: Max. 2 mm
- Flanging Method: Rotary Rolling
- Inlet/Outlet Pipe Extension: Max. 100 mm
- Power: ~ 10 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3m x 2m x 3.5m
- FOB Price: USD 10,000 – 15,000 (New)
- Gross Weight: ~ 3 ton

9. Double Station Ridge Locking Machine



- No. of Forming Station: 2 nos.
- Shell Body Length: 200 – 800 mm
- Tube Material Thickness:
 - Carbon Steel: 0.8 – 2 mm
 - Stainless Steel: 0.8 – 1.5 mm
- Forming Method: Expanding Mandrel
- Inlet/Outlet Pipe Extension: Max. 100 mm
- Power: ~ 6 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2m x 2m x 3m
- FOB Price: USD 8,000 – 12,000 (New)
- Gross Weight: ~ 2 ton

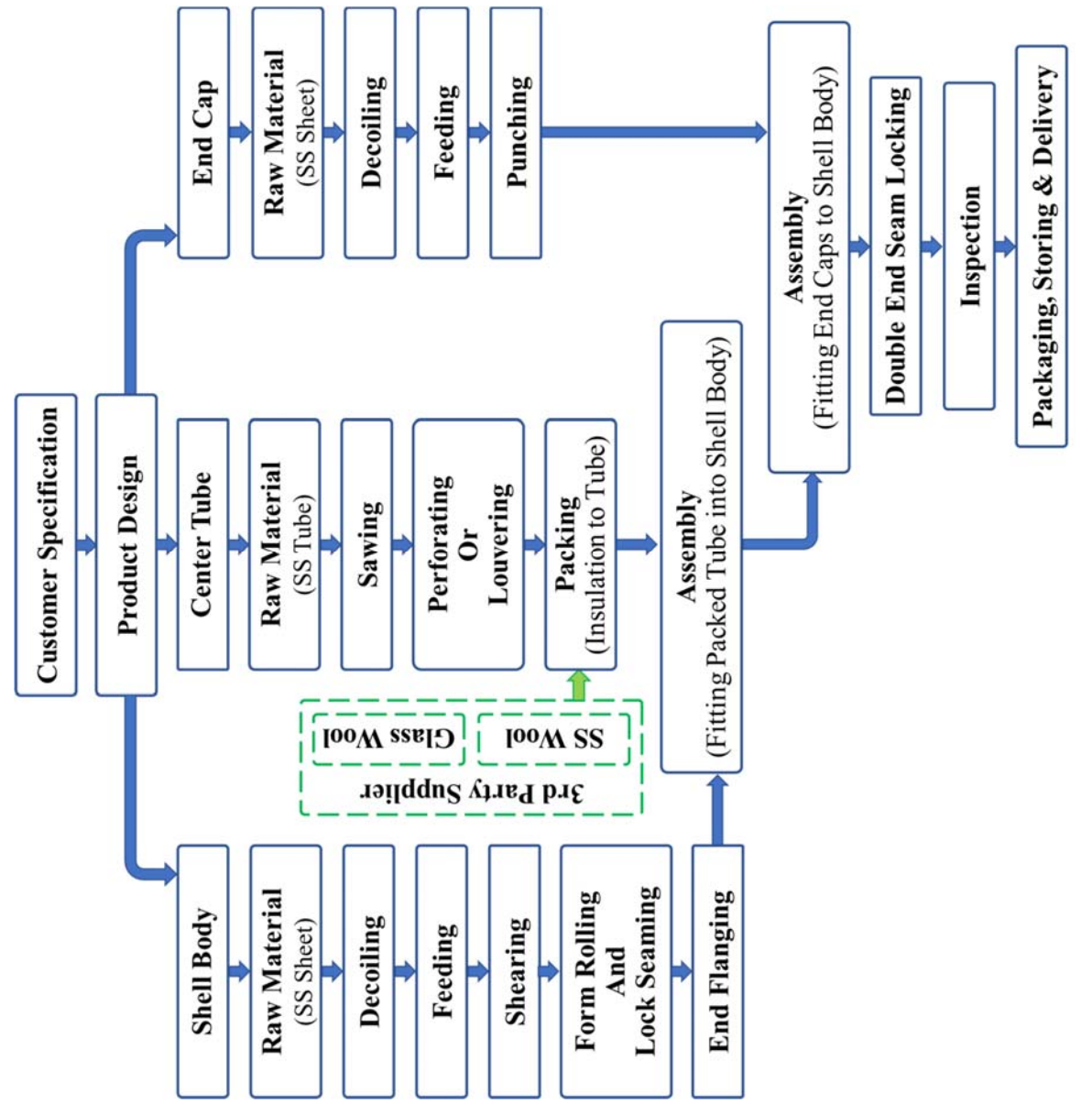
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Boljanovic, Vukota, "Metal Shaping Processes", Industrial Press Inc., 2009.

Production Process Flow Chart:



Product-08: Telescopic Prop			
Sub-sector:	Construction Equipment & Accessories		
HS-2007:	7308.40.00	BSIC-2009:	2511
		BCPC-2011:	42190
Description:			
A Telescopic Prop is a type of adjustable scaffolding/ shuttering member used to support all kind of formwork like slabs, beams, walls and columns.			
Product:			
Component:	1. Outer Tube with Base Plate	2. Inner Tube with Top Support	3. Locking Mechanism (Prop Nut & G-Pin)
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Tube (Galvanized) (60mm O.D.; 3 mm thickness) and (50mm O.D.; 3 mm thickness) 	<ul style="list-style-type: none"> MS Strip (5mm thickness) 	
Accessories:	<ul style="list-style-type: none"> Prop Nut with Handle 	<ul style="list-style-type: none"> G-Pin 	
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 			
Machineries, Equipment and Specification:			
1. Hydraulic Plate Shearing Machine			
		<ul style="list-style-type: none"> Back Gauge Length: ~ 600 mm Shear Length: Max. 2,500 mm Blade Angle Adjustment: 0.5 – 1.5 Degrees Blade Gap Adjustment: 5 – 10 mm, Manual Shearing Thickness (MS): Max. 8 mm Stroke Rate: 20 – 45 per min. Power: ~ 15 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 3m x 2m x 2m FOB Price: USD 15,000 – 18,000 (New) Gross Weight: ~ 5 ton 	

2. Band Saw Machine



- Blade Size (LxW): ~ 2,500 mm x 20 mm
- Blade Thickness: 0.75 mm
- Blade Speed: 100/150/200/250 rpm
- Cutting Range (@ 90 Degree):
 - Circular: Max. Dia. 180 mm
 - Rectangular: Max. 180 mm x 300 mm
- Power: ~ 10 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2.5m x 1.5m x 2m
- FOB Price: USD 3,000 – 5,000 (New)
- Gross Weight: ~ 1.5 ton

3. Horizontal Multi-Spindle Drilling Machine



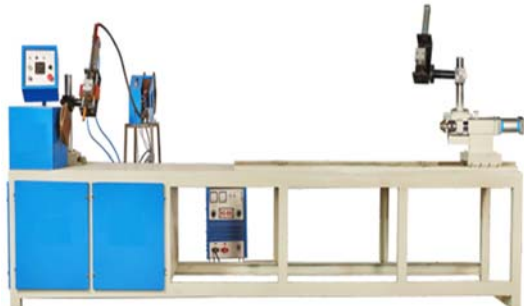
- No. of Spindle: 5 – 15 nos.
- No. of Drill per Spindle: 1 nos.
- Spindle Center-Center Distance: 100 mm
- Spindle Rotation Speed: 200 – 3,000 rpm
- Spindle Travel: Max. 200 mm
- Drilling Dia.: 20 – 40 mm
- Carriage Travel Speed: 50 m/min
- Power: ~ 12 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3m x 1.5m x 2m
- FOB Price: USD 8,000 – 12,000 (New)
- Gross Weight: ~ 2 ton

4. Plate Air-Bending Press Brake



- Nominal Force: 600 ton
- Allowable Plate Thickness: Max. 10 mm
- Working Length: 3,000 mm
- Usable Open Height: 475 mm
- Depth of Throat: 400 mm
- Working Speed: 9 mm/sec.
- Rapid Speed: 120 mm/sec.
- Power: ~ 50 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3.1m x 2.5m x 3m
- FOB Price: USD 25,000 – 30,000 (New)
- Gross Weight: ~ 35 ton

5. Jack Welding Machine



- Welding Method: Arc Welding (MIG)
- Welding Current: 200 – 300 A
- Rotation Speed: 2 – 10 rpm
- Welding Gun Travel: Max. 100 mm
- Welding Gun Swing: 0 – 60 mm
- Welding Gun Lifting Stage: 0 – 5 nos.
- Work-piece Dia.: 40 – 300 mm
- Work-piece Length: 300 – 2,500 mm
- Power: ~ 8 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2.8m x 1m x 1.8m
- FOB Price: USD 5,000 – 10,000 (New)
- Gross Weight: ~ 1.2 ton

6. Dip Paint Line



- No. of Dip Tanks: 3 – 5 nos.
- Stages of Dipping: De-scaling, Rinsing, Dip Painting, Dripping, Drying, etc.
- Tank Size (LxWxD): 5m x 2.5m x 3m
- Conveyor Type: Overhead crane
- Crane Load Capacity: Max. 3 ton
- Crane Speed: 0.5 – 2 m/min.
- Power: ~ 10 kW
- Dimension (LxWxH): 15m x 6m x 7m
- FOB Price: USD 25,000 – 30,000 (New)
- Gross Weight: ~ 15 ton

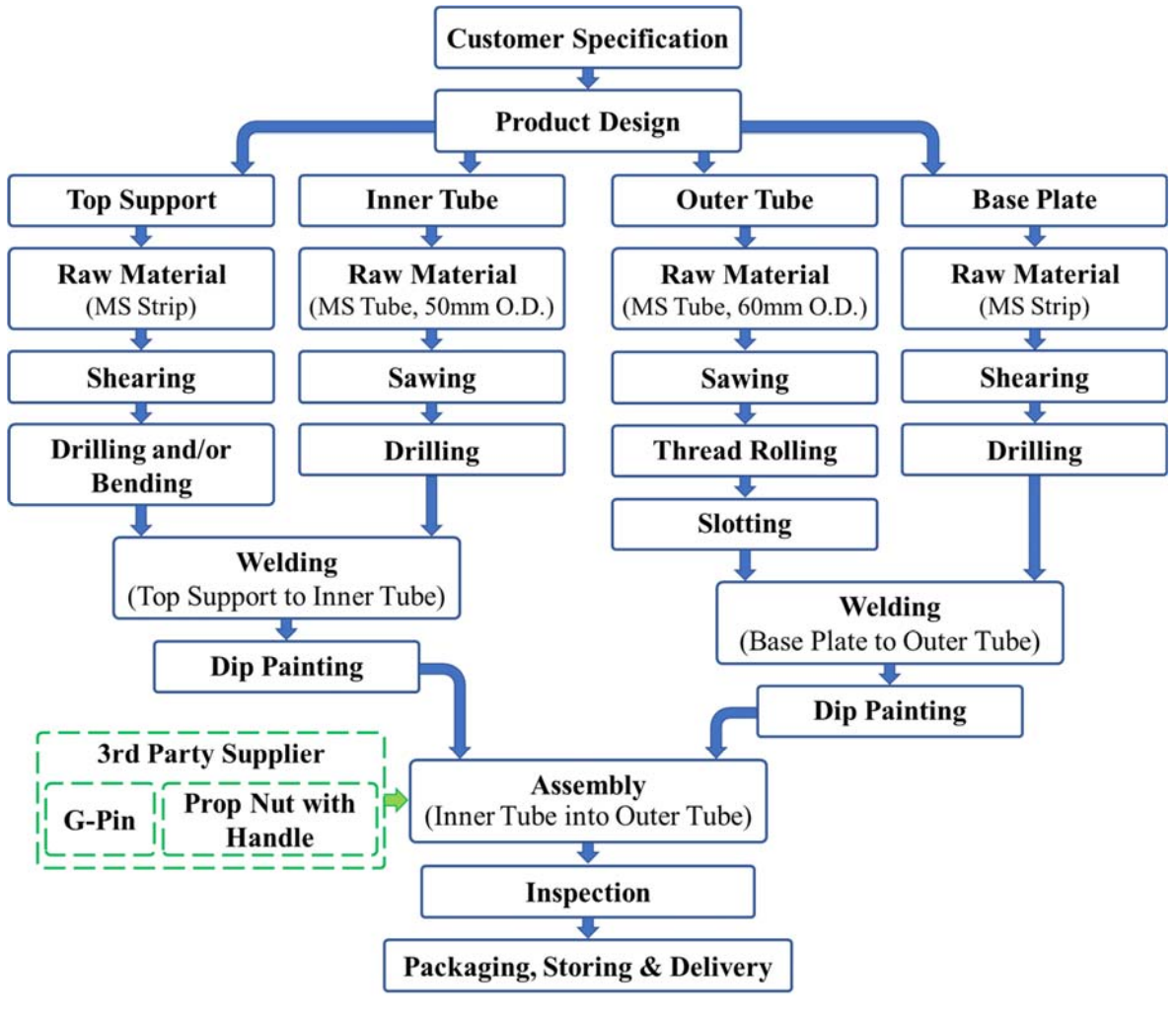
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Flood, C.R., "Fabrication Welding and Metal Joining Processes", Butterworth-Heinemann Ltd., 1981.

Production Process Flow Chart:



Product-09: Wheelbarrow			
Sub-sector:	Construction Equipment & Accessories		
HS-2007:	8716.80.00	BSIC-2009:	2821
		BCPC-2011:	49232
Description:	A wheelbarrow is a small hand-propelled cart with wheel at front and supporting legs and handles at rear, used typically for carrying loads in building work or gardening.		
Product:			
Component:	1. Frame (With Leg and Handle)	2. Bucket/ Pan	3. Wheel & Axle
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Tube (25mm O.D.; 1 mm thickness) 	<ul style="list-style-type: none"> MS Angle (25 x 25mm, 3mm thickness) 	
	<ul style="list-style-type: none"> MS Sheet (2mm thickness) 		
Accessories:	<ul style="list-style-type: none"> Bearing 	<ul style="list-style-type: none"> Wheel & Axle 	<ul style="list-style-type: none"> Bolts & Nuts
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 			
Machineries, Equipment and Specification:			
1. Compound Miter Saw			
		<ul style="list-style-type: none"> Blade: 254 mm O.D.; 25.4 mm Bore Speed: ~ 1,800 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.8m x 0.5m x 0.7m FOB Price: USD 250 – 400 (New) Gross Weight: ~20 kg 	

2. Sheet Shearing Machine



- Back Gauge Length: ~ 600 mm
- Shear Length: Max. 1,200 mm
- Blade Angle Adjustment: 0.5 – 1.5 Degrees
- Blade Gap Adjustment: 5 – 10 mm, Manual
- Shearing Thickness (MS): Max. 3 mm
- Power: ~ 8 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 2m x 1m x 1.3m
- FOB Price: USD 10,000 – 12,000 (New)
- Gross Weight: ~ 1.5 ton

3. Multi-Process Welding Machine



- Process: Stick (MMAW), L-TIG (GTAW)
- Power: ~ 8 kW (220V, 1 Phase, 50 Hz)
- Effective Input Current: ~ 10 – 15 A
- OCV (MMAW/GTAW): 70/20 V DC
- Output Current: 5 – 150 A
- Duty Cycle (40°C, 10 min): Adjustable
- Electrode (MMAW): E6010-13; 1.6- 4mm
- Dimension (LxWxH): 0.2m x 0.4m x 0.5m
- FOB Price: USD 350 –800 (New)
- Gross Weight: ~ 22 kg

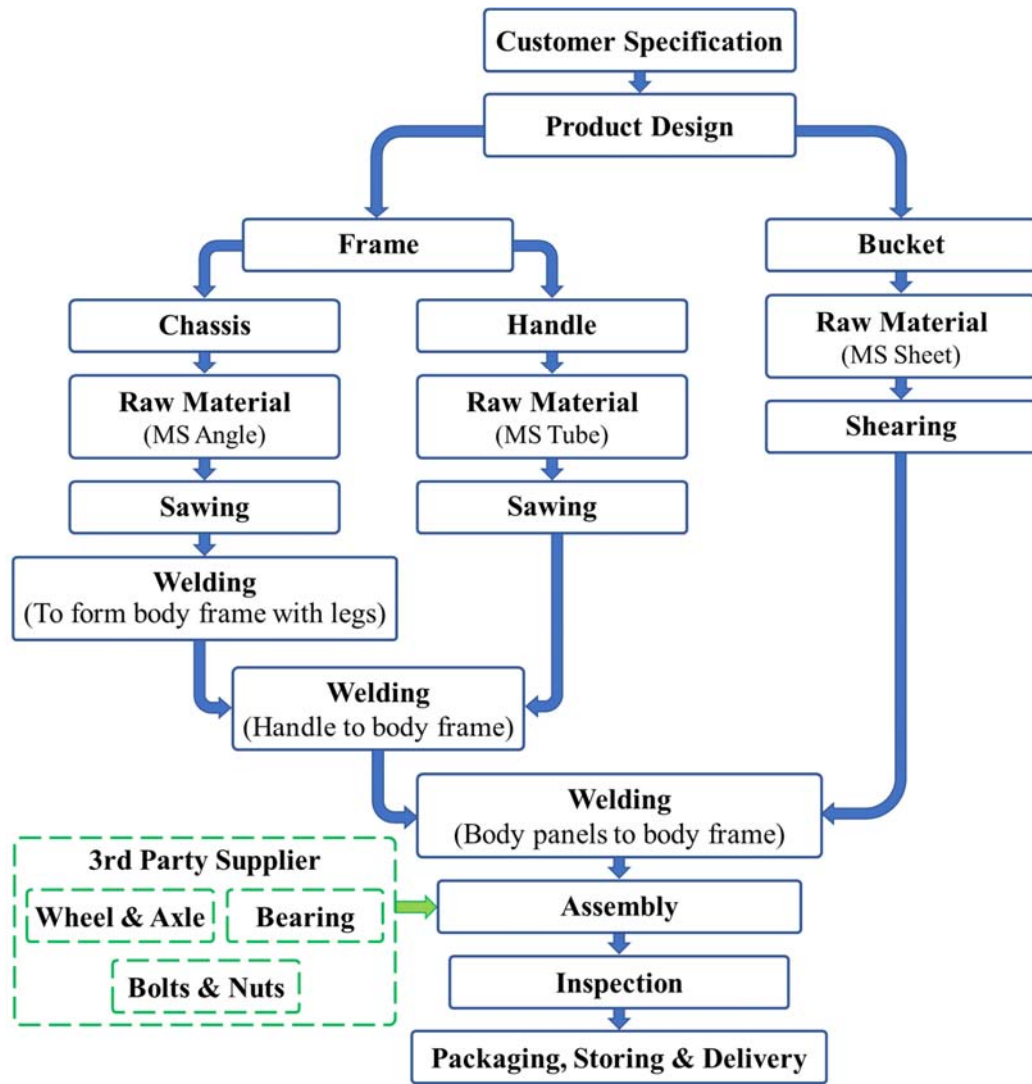
Machineries Supplier:

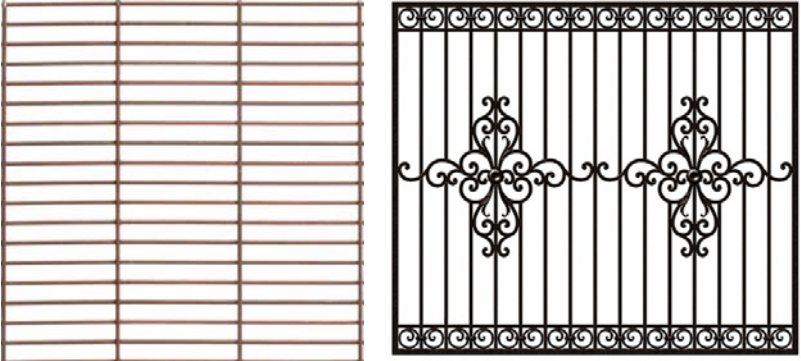

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Flood, C.R., "Fabrication Welding and Metal Joining Processes", Butterworth-Heinemann Ltd., 1981.

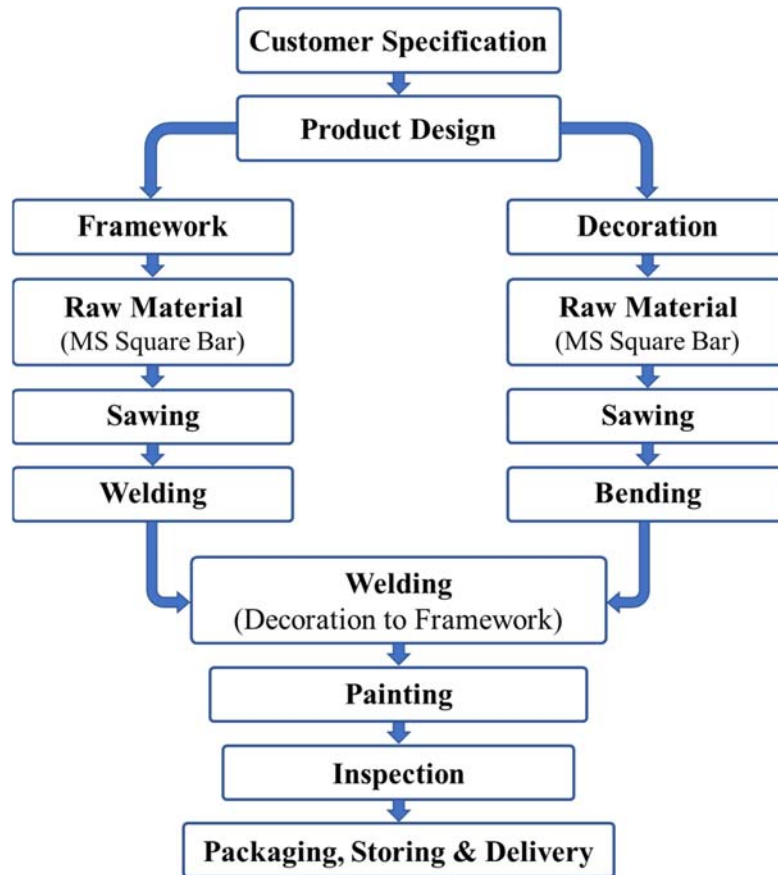
Production Process Flow Chart:





Product-10: Window Grill			
Sub-sector:	Construction Equipment & Accessories		
HS-2007:	7314.20.00	BSIC-2009:	2599
		BCPC-2011:	42943
Description:	A Window Grill is a grating of metal, wood, stone, or other material used as a screen, divider, barrier, or as a purely decorative element fitted to a window either inside or outside.		
Product:			
Component:	1. Framework	2. Decoration	
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Square Bar (10 x 10 mm) 		
Accessories:	<ul style="list-style-type: none"> None 		
Raw Material Supplier:	<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 		
Machineries, Equipment and Specification:			
1. Compound Miter Saw			
	<ul style="list-style-type: none"> Blade: 254 mm O.D.; 25.4 mm Bore Speed: ~ 1,800 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.8m x 0.5m x 0.7m FOB Price: USD 250 – 400 (New) Gross Weight: ~20 kg 		

2. Bar or Wire Bending Machine	
	<ul style="list-style-type: none"> • Bar Thickness Range: 2 – 10 mm • Bar UTS Range: Max. 750 MPa • Bending Angle: 0 – 180 Degree • Bending Speed: 72 Degree/Second • Power: ~ 5 kW (220V, 1 Phase, 50 Hz) • Dimension (LxWxH): ~ 1m x 1m x 0.8m • Optional Feature: Cutting • FOB Price: USD 800 – 1,500 (New) • Gross Weight: ~ 500 kg
3. Manual Metal Arc (MMA) Welding Machine	
	<ul style="list-style-type: none"> • Effective Input Current: ~ 10 – 20 A • No Load Voltage: 56 V DC • Output Current: 60 – 250 A • Duty Cycle (40oC, 10 min): Adjustable • Electrode: 2.5 – 5 mm • Power: ~ 5 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 0.5m x0.3m x0.4m • FOB Price: USD 500 – 1,200 (New) • Gross Weight: ~ 30 kg
4. Angle Grinder	
	<ul style="list-style-type: none"> • No Load Speed: ~ 11,000 rpm • Spindle Thread: M14 • Disk Dia.: 115 mm • Rubber Backing Pad Dia.: 115 mm • Power: 900 W (220V, 1 Phase, 50 Hz) • Dimension (LxWxH): ~ 0.3m x 0.1m x 0.2m • FOB Price: USD
Machineries Supplier: <ul style="list-style-type: none"> • Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085. • China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370. • Machine & Tools International. Mobile: +8801743-270839, +8801759-401381. 	
Bibliography: <ul style="list-style-type: none"> • Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977. • Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015. • Flood, C.R., "Fabrication Welding and Metal Joining Processes", Butterworth-Heinemann Ltd., 1981. 	

Production Process Flow Chart:



Product-11: Sheet Metal Door			
Sub-sector:	Construction Equipment & Accessories		
HS-2007:	7308.30.00	BSIC-2009:	2511
		BCPC-2011:	42120
Description:			
A Sheet Metal Door is a hinged hollow door made out of metal sheets as skin and has a hollow core of light filler materials such as honeycomb, EPS foam, etc. with or without stiffeners.			
Product:			
Component:	1. Door Frame		2. Door Panel and Stiffener
	3. Door Core		4. Locking Mechanism
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> SS Sheet (2 mm thickness, 14 gauge) 	<ul style="list-style-type: none"> Honeycomb Core (Density: 15 kg/m³, Cell Size:25 mm) 	
Accessories:	<ul style="list-style-type: none"> Locking Mechanism and Screw 	<ul style="list-style-type: none"> Hinge and Hinge Reinforcement 	
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Ansha Insulation Museum. Shop: C-5 (2nd Floor), Jabin Tower, 234-235, 236C Nawabpur Road, Dhaka-1100. Mobile: +8801725-265-554, +8801816-255-324. 			
Machineries, Equipment and Specification:			
1. Sheet Shearing Machine			
		<ul style="list-style-type: none"> Back Gauge Length: ~ 500 mm Shear Length: Max. 2,500 mm Blade Angle Adjustment: 0.5 – 2 Degrees Blade Gap Adjustment: 5 – 10 mm, Manual Shearing Thickness (SS): Max. 6 mm Power: ~ 10 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 3m x 1.5m x 2m FOB Price: USD 12,000 – 15,000 (New) Gross Weight: ~ 6 ton 	

2. Stamping or Embossing Press Machine



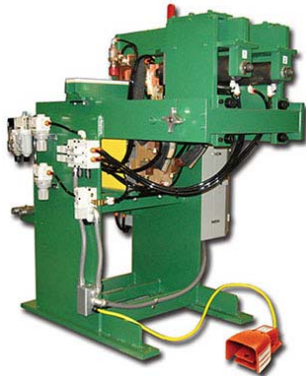
- Nominal Force: 2,500 ton
- Cushion Force: 35 ton
- Die Opening Height: Max. 600 mm
- Slide Stroke: Max. 500 mm
- Slide Descend/ Return Speed: ~ 150 mm/sec
- Slide Working Speed: 5 – 10 mm/sec
- Working Table Size: 2,500 mm x 1,500 mm
- Power: ~ 50 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 3.5m x 3m x 3.5m
- FOB Price: USD 35,000 – 50,000 (New)
- Gross Weight: ~ 50 ton

3. Sheet Bending Press Brake Machine



- Bending Length: Max. 3,000 mm
- Nominal Force: 300 ton
- Throat Depth: ~ 400 mm
- Beam Stroke: ~ 350 mm
- Daylight: ~ 550 mm
- Beam Descend/ Return Speed: ~ 180 mm/sec
- Beam Bending Speed: ~ 0 – 10 mm/sec
- Power: ~ 35 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 4m x 2m x 3.5m
- FOB Price: USD 25,000 – 40,000 (New)
- Gross Weight: ~ 15 ton

4. Butt-Upset Welding Machine



- Output Voltage: ~ 15 VDC
- Welding Current: Max. 20,000 A
- Holding Pressure: Max. 100 MPa
- Stroke: Max. 100 mm
- Throat Size (LxD): 225 mm x 500 mm
- Cooling Water Consumption: ~ 8 l/min
- Power: 50 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 1m x 1.5m x 1.5m
- FOB Price: USD 2,000 – 3,500 (New)
- Gross Weight: ~ 0.6 ton

5. Travelling Arm Automatic Spot Welding Machine



- Output Voltage: ~ 15 VDC
- Welding Current: Max. 50,000 A
- Holding Pressure: Max. 10 MPa
- Welding Table Size: 1,000 mm x 2,500 mm
- Table Height Adjustment: 0 – 200 mm
- Crank-Arm Travel: Max. 1,500 mm
- Crank-Arm Rotation: Max. 180 Degrees
- Cooling Water Consumption: ~ 10 l/min
- Power: 75 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 3m x 2m x 2m
- FOB Price: USD 5,000 – 8,000 (New)
- Gross Weight: ~ 1.5 ton

6. Longitudinal Seam Welding Machine



- Output Voltage: ~ 12 VDC
- Welding Current: Max. 30,000 A
- Holding Pressure: Max. 100 MPa
- Welding Table Size: 1,000 mm x 2,500 mm
- Stroke: Max. 100 mm
- Cooling Water Consumption: ~ 8 l/min
- Power: 50 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 3m x 2m x 1.5m
- FOB Price: USD 3,000 – 5,000 (New)
- Gross Weight: ~ 1.5 ton

7. Powder Coating System (Pre-Treatment, Coating, Curing, Conveyor Line)

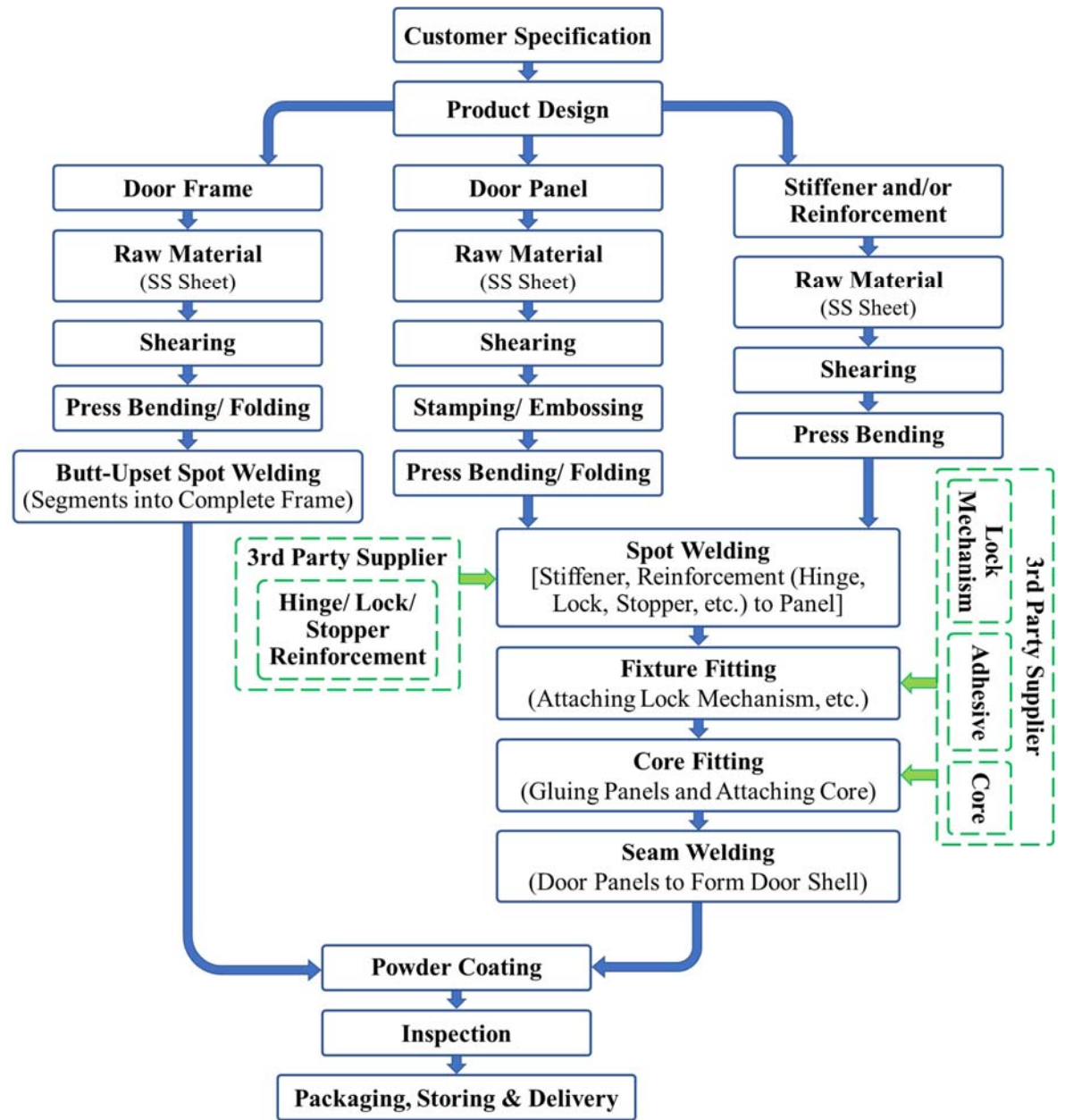


- Part Opening Size: 1.5 m x 3 m
- Coating Rated CFM: 10,000
- No. of Gun: Max. 8 nos./rack/side
- No. of Rack (2 sided): 1 – 3 nos./station
- Filter: 8 nos. (Length: 48 in.)
- Air Consumption (@100 psi): 25 SCFM
- Oven Heating Method: Infrared
- Conveyor Speed: Max. 5 m/ min
- Recovery Method: Cyclone and Electrostatic
- Power: 30 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 20m x 3m x 3.5m
- FOB Price: USD 30,000 – 50,000
- Gross Weight: ~ 12 ton

Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.




Production Process Flow Chart:






Bibliography:

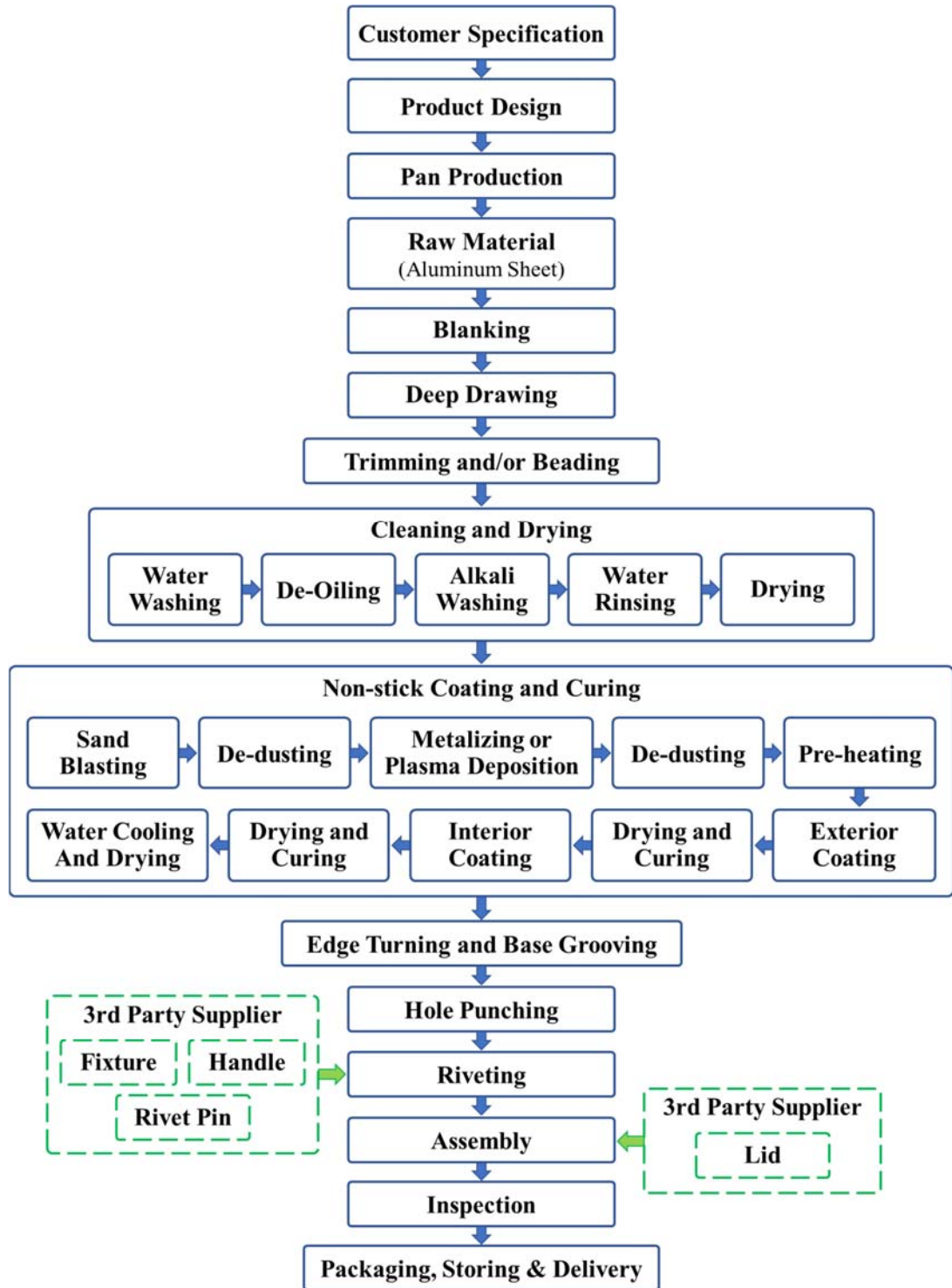
- Rowe, Geoffrey W., “Principles of Industrial Metalworking Processes”, Crane Russak & Co., 1977.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Flood, C.R., “Fabrication Welding and Metal Joining Processes”, Butterworth-Heinemann Ltd., 1981.

Product-12: Saucepan					
Sub-sector:	Cookware				
HS-2007:	7615.10.00	BSIC-2009:	2599	BCPC-2011:	42912
Description: A Saucepan is a pot or vessel used for cooking with typically round base, vertical sides of comparable height to its diameter and handle and lid.					
Product:					
Component:	1. Pan	2. Handle	3. Lid		
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> Aluminum Sheet (5 mm thickness, 6 gauge) 				
Accessories:	<ul style="list-style-type: none"> Alkali Wash Agent 	<ul style="list-style-type: none"> De-oil Agent 	<ul style="list-style-type: none"> Metalizing Agent 		
	<ul style="list-style-type: none"> Non-stick Coating (Primer, Base Coat, Clear Coat) 				
	<ul style="list-style-type: none"> Handle and Fixture 	<ul style="list-style-type: none"> Rivet Pins 	<ul style="list-style-type: none"> Lid 		
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Aluminium Manufacturers' Association. Mahtab Center, 177, Shahed Syed Nazrul Islam Sarani, Dhaka-1000. Tel: +8802- 9335213, Mobile: +8801199-850937. Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. 					
Machineries, Equipment and Specification:					
1. Punch Press/ Deep Drawing Machine					
			<ul style="list-style-type: none"> Nominal Force: 200 ton Cushion Force: 15 ton Die Opening Height: Max. 400 mm Slide Stroke: Max. 250 mm Cushion Stroke: Max.100 mm Slide Descend/ Return Speed: ~ 100 mm/sec Slide Working Speed: 5 – 50 mm/sec Working Table Size: 1,000 mm x 700 mm Power: ~ 40 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): ~ 2m x 2.5m x 3.5m FOB Price: USD 35,000 – 50,000 (New) Gross Weight: ~ 20 ton 		

2. Trimming Machine	
	<ul style="list-style-type: none"> • Operation Stage: Trimming, Beading, Ribbing, Curling, Flanging, etc. • Workpiece Dia.: 50 – 400 mm • Workpiece Height: 50 – 300 mm • Workpiece Material Thickness: Max. 5 mm • Power: ~ 10 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): ~ 2.5m x 1m x 1.5m • FOB Price: USD 8,000 – 12,000 (New) • Gross Weight: ~ 2 ton
3. Washing and Drying Line	
	<ul style="list-style-type: none"> • Operation Stage: Water Washing, De-oiling, Alkali Washing, Drying, etc. • Transport Type: Wire Mesh Conveyor • Chamber Size (LxWxH): 18m x 2m x 1.5m • Water Consumption: 1,000 – 2,500 l/ hr • Alkali Tank Temperature: Max. 70°C • Heating Method: Electricity • Dryer Temperature: Max. 120°C • Power: ~ 100 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): ~ 18.5m x 2.2m x 3m • FOB Price: USD 50,000 – 80,000 (New) • Gross Weight: ~ 12 ton
4. Non-stick Coating Line	
	<ul style="list-style-type: none"> • Operation Stage: Sand Blasting, Metalizing, De-dusting, Pre-heating, Coating (Exterior & Interior), Curing, Cooling. • Transport Type: Rotating Spindle Conveyor • Workpiece Dia.: Max. 400mm • Workpiece Height: Max. 250mm • Blasting Abrasive: Aluminum Oxide • Metalizing Coating: SS Plasma Deposition • De-dusting Method: Air Wash (Air Jet) • Heating Method: Gas Burner (LPG, Natural) • Power: ~ 200 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 20m x 15m x 3.5m • FOB Price: USD 1,00,000 – 1,50,000 (New) • Gross Weight: ~ 20 ton



5. Turning and Grooving Machine	
	<ul style="list-style-type: none"> • Operation Stage: Edge Turning, Base Grooving. • Workpiece Dia.: Max. 300 mm • Workpiece Height: Max. 400 mm • Work Station: 2 (Edging: 1, Grooving: 1) • Cutting Tool: Diamond, Carbide, etc. • Power: ~ 8 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 1.5m x 1m x 1.8m • FOB Price: USD 6,000 – 8,000 (New) • Gross Weight: ~ 0.8 ton
6. Hole Punching Machine	
	<ul style="list-style-type: none"> • Workpiece Dia.: 60 – 300 mm • Workpiece Height: Max. 250 mm • Workpiece Material Thickness: Max. 5 mm • Hole Dia.: 2 – 10 mm • Hole-to-Hole Distance: 5 – 50 mm • Blanking Pressure: Max. 3 ton • Power: 5 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): ~ 1m x 1m x 1.5m • FOB Price: USD 3,000 – 5,000 • Gross Weight: ~ 0.3 ton
7. Riveting Machine	
	<ul style="list-style-type: none"> • Workpiece Material Thickness: Max. 5 mm • Riveting Method: Spin/ Orbital • Riveting Capacity: Max. 6 mm • Throat Depth: Max. 150 mm • Shut Length: Max. 175 mm • Stroke Distance: Max. 100 mm • Axial Force: Max. 1.2 ton • Power: 5 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): ~ 0.3m x 0.6m x 1.5m • FOB Price: USD 2,000 – 3,000 • Gross Weight: ~ 0.6 ton
Machineries Supplier: <ul style="list-style-type: none"> • Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085. • China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370. • Machine & Tools International. Mobile: +8801743-270839, +8801759-401381. • United Trading Company. Mobile: +8801689-995162, +8801715-295798. 	

Production Process Flow Chart:



Bibliography:

- Banabic, Dorel, “Sheet Metal Forming Processes”, Springer-Verlag Berlin Heidelberg, 2010.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.

Product-13: Display Counter					
Sub-sector:	Food Processing				
HS-2007:	8418.50.90	BSIC-2009:	2819	BCPC-2011:	43913
Description:	A Bakery Display Counter is an enclosed case refrigerated/ non-refrigerated showcasing product within on multiple adjustable/ fixed shelves, through a clear straight or curved glass.				
Product:					
Component:	1. Frame	2. Body Panel	3. Shelves (Wire/Sheet)	4. Door/Hatch	
	5. Front Glass (Curved/Straight)		6. Feature (Refrigeration/Light/Tray, etc.)		
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> SS Rectangular Tube (50mm x 40mm; 2mm thick) 		<ul style="list-style-type: none"> SS Sheet (20 gauge/ 1 mm thick) 		
	<ul style="list-style-type: none"> SS Wire/ Rod (5mm dia.) 		<ul style="list-style-type: none"> Aluminum Profiles (50x20 mm) 		
Accessories:	<ul style="list-style-type: none"> Tempered Glass 	<ul style="list-style-type: none"> Drill, Rivet & Gun 	<ul style="list-style-type: none"> Door Fixture 		
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 					
Machineries, Equipment and Specification:					
1. Compound Miter Saw Machine (Circular Saw)					
			<ul style="list-style-type: none"> Blade: 305 mm O.D.; 25.4 mm Bore; Carbide No Load Speed: ~ 3,500 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Power: ~ 1.7 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.7m x 0.5m x 0.6m FOB Price: USD 200 – 300 (New) Gross Weight: ~18 kg 		

2. Tube/ Profile Bending Machine	
	<ul style="list-style-type: none"> • Acceptable Shape: Round/Square Tube/Profile, Channel, Angle • Shaft Dia.: 50/40 mm • Roll Dia.: 152/162 mm • No. of Roll: 3 nos. • Bending Speed: 3.3 m/min • Adjustment Range: 120 mm • Hydraulic Pump Capacity: 2 kW • Power: ~ 3 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 0.8m x 1m x 1.6m • FOB Price: USD 3,000 – 5,000 (New) • Gross Weight: ~ 0.6 ton
3. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 5 kW (220V, 1 Phase, 50 Hz) • Effective Input Current: ~ 10 – 30 A • OCV (MMAW/GTAW): 80/15 V DC • Output Current: 25 – 200 A • Duty Cycle (40°C, 10 min): 70% • Electrode: E6010-13; 0.8- 2 mm • Dimension (LxWxH): 0.3m x 0.5m x 0.5m • FOB Price: USD 1,000 – 2,000 (New) • Gross Weight: ~ 25 kg
4. Hydraulic Shearing Machine	
	<ul style="list-style-type: none"> • Front Gauge Length: ~ 1,000 mm • Back Gauge Length: ~ 500 mm • Shear Length: ~ 2,000 mm • Blade Angle: ~ 0 – 3 Degree (Adjustable) • Sheet Thickness (MS/SS): Max. 6/4 mm • Stroke Rate: ~ 10 – 25 per minute • Power: ~ 20 kW (380V, 3 Phase) • Dimension (LxWxH): ~2.2m x 1.5m x 2m • FOB Price: USD 12,000-15,000 (New) • Gross Weight: ~ 8 ton

5. Sheet Bending Press Brake Machine



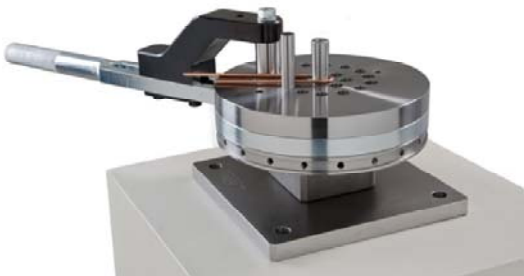
- Bending Length: 2,500 mm
- Nominal Force: 200 ton
- Throat Depth: ~ 450 mm
- Beam Stroke: ~ 300 mm
- Daylight: ~ 500 mm
- Beam Descend/ Return Speed: ~ 150 mm/sec
- Beam Bending Speed: ~ 0 – 10 mm/sec
- Power: ~ 20 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3m x 1.8m x 3m
- FOB Price: USD 20,000 – 35,000 (New)
- Gross Weight: ~ 12 ton

6. Bench Drill/ Mill Machine



- Drilling Depth: ~ 200 mm
- Chuck Capacity: 13 mm
- Spindle Taper: MT2 / MT3 / MT4/ R8
- Spindle Speed: 90 – 2,000 (8 Steps)
- Feed Range: ~ 0.5 mm/rev
- Table Size (LxW): 200mm x 700mm
- Table Travel (X, Y axis): 500 mm, 150 mm
- Power: ~ 2 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 0.8m x 0.4m x 1m
- FOB Price: USD 1,500 – 3,000 (New)
- Gross Weight: ~ 200 kg

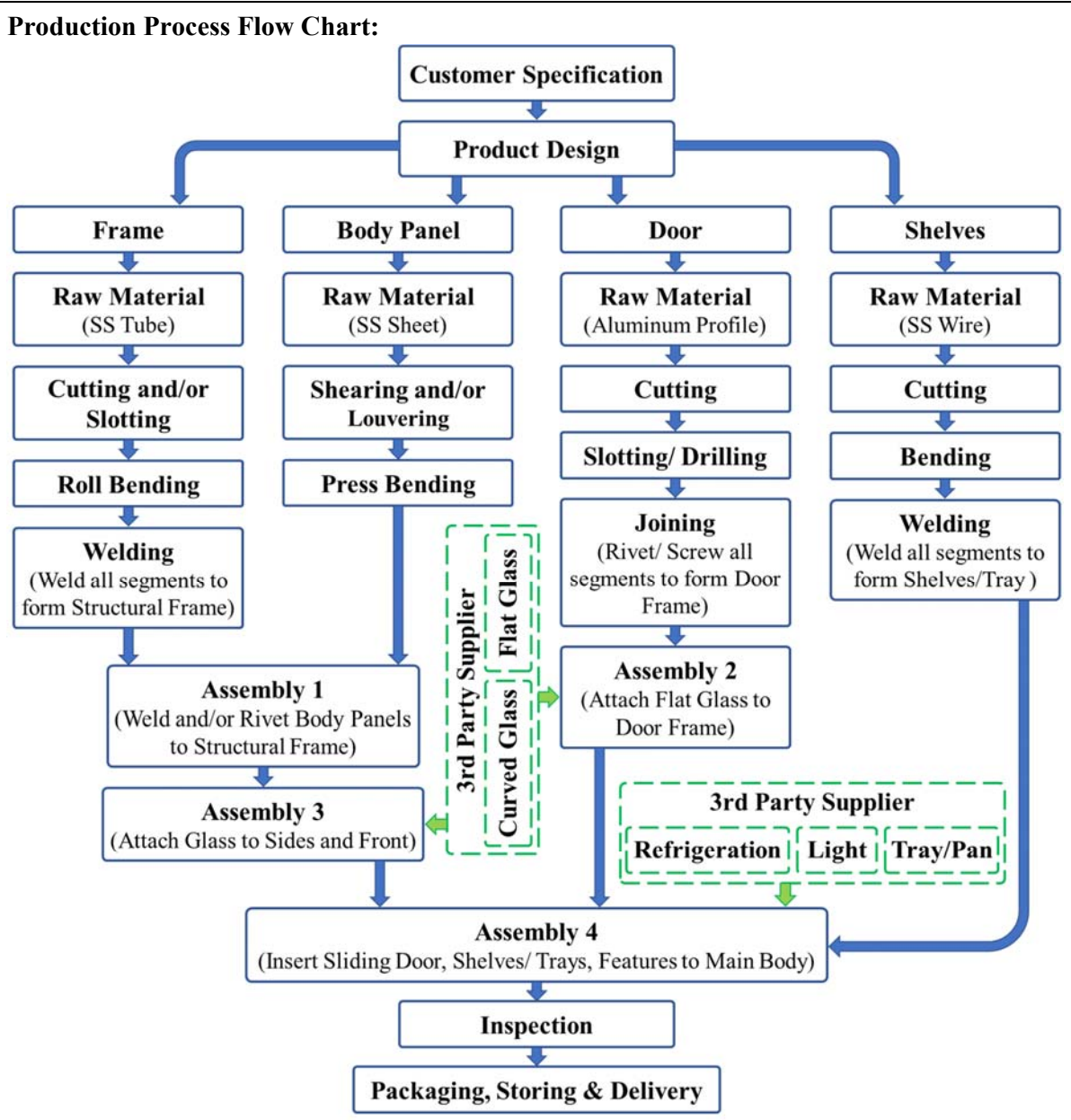
7. Manual Wire Bender



- Wire Dia. (MS): Max. 10 mm
- Radius Capacity: Min. 10 mm, Max. 50 mm
- Center Pin Hole Dia.: 20 mm
- Operating Leverage: 400 mm
- Dimension (LxWxH): ~ 0.6m x 0.6m x 1.5m
- FOB Price: USD 500 – 1,500
- Gross Weight: ~ 10 kg



Machineries Supplier:




- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.



Bibliography:

- Banabic, Dorel, “Sheet Metal Forming Processes”, Springer-Verlag Berlin Heidelberg, 2010.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.

Product-14: Baking Oven			
Sub-sector:	Food Processing		
HS-2007:	8417.20.00	BSIC-2009:	2825
		BCPC-2011:	44515
Description: A Bakery Display Counter is an enclosed case refrigerated/ non-refrigerated showcasing product within on multiple adjustable/ fixed shelves, through a clear straight or curved glass.			
Product:			
Component:	1. Frame	2. Body Panel	3. Heating Mechanism
	4. Conveyor Mechanism		
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Rectangular Tube (50mm x 40mm; 2mm thick) 	<ul style="list-style-type: none"> MS Sheet (20 gauge/ 1 mm thick) 	
	<ul style="list-style-type: none"> MS Round Pipe (Galvanized) (2 mm thick, 20 mm dia.) 		
Accessories:	<ul style="list-style-type: none"> Insulation 	<ul style="list-style-type: none"> Burner and Motor 	<ul style="list-style-type: none"> Pipe Bends/ Elbows
	<ul style="list-style-type: none"> Valves & Switches 	<ul style="list-style-type: none"> Exhaust Unit 	<ul style="list-style-type: none"> Temperature Controller
	<ul style="list-style-type: none"> SS Wire Mesh/ Slats 	<ul style="list-style-type: none"> Motor Controller 	<ul style="list-style-type: none"> Conveyor Roller/Track
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 			
Machineries, Equipment and Specification:			
1. Band Saw Machine			
		<ul style="list-style-type: none"> Blade Size (LxW): ~ 2,000 mm x 25 mm Blade Thickness: 0.8 mm Blade Speed: 80/120/200/240 rpm Cutting Range (@ 90 Degree): <ul style="list-style-type: none"> o Circular: Max. Dia. 200 mm o Rectangular: Max. 200 mm x 400 mm Power: ~ 12 kW (400V, 3 Phase, 50 Hz) Dimension (WxDxH): 3m x 1.8m x 2m FOB Price: USD 5,000 – 8,000 (New) Gross Weight: ~ 2.5 ton 	

2. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 5 kW (220V, 1 Phase, 50 Hz) • Effective Input Current: ~ 10 – 30 A • OCV (MMAW/GTAW): 60/24 V DC • Output Current: 25 – 230 A • Duty Cycle (40°C, 10 min): 50% • Dimension (LxWxH): 0.4m x0.3m x0.5m • FOB Price: USD 1,000 – 1,500 (New) • Gross Weight: ~ 20 kg
3. Hydraulic Shearing Machine	
	<ul style="list-style-type: none"> • Front Gauge Length: ~ 500 mm • Back Gauge Length: ~ 500 mm • Shear Length: ~ 2,500 mm • Blade Angle: ~ 0 – 3 Degree (Adjustable) • Sheet Thickness (MS/SS): Max. 5/3 mm • Stroke Rate: ~ 5 – 20 per minute • Power: ~ 15 kW (380V, 3 Phase) • Dimension (WxDxH): ~2.8m x 1.5m x 2m • FOB Price: USD 15,000-18,000 (New) • Gross Weight: ~ 5 ton
4. Sheet Bending Press Brake Machine	
	<ul style="list-style-type: none"> • Bending Length: 3,000 mm • Nominal Force: 250 ton • Throat Depth: ~ 400 mm • Beam Stroke: ~ 250 mm • Daylight: ~ 450 mm • Beam Descend/ Return Speed: ~ 150 mm/sec • Beam Bending Speed: ~ 0 – 15 mm/sec • Power: ~ 18 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 3.2m x 2 m x 3m • FOB Price: USD 25,000 – 35,000 (New) • Gross Weight: ~ 10 ton
5. Pneumatic Rivet Machine	
	<ul style="list-style-type: none"> • Working Range (MS): Max. 4 mm Dia. • Compressed Air: 1 liter @ Max. 100 psi • Traction Power: 2,700 N • Stroke: 25 mm • Dimension (LxWxH): ~ 0.4m x 0.1m x 0.3m • FOB Price: USD 300 – 1,000 (New) • Gross Weight: ~ 1.6 kg

6. Powder Coating Machine (Pre-Treatment, Coating, Curing, Conveyor Line)



- Part Opening Size: Max. 1.5 m x 2 m
- Coating Rated CFM: 8,000
- No. of Gun: Max. 6 nos./rack/side
- No. of Rack (2 sided): 1 – 3 nos./station
- Filter: 8 nos. (Length: 48 in.)
- Air Consumption (@100 psi): 20 SCFM
- Oven Heating Method: Infrared
- Conveyor Speed: Max. 5 m/ min
- Recovery Method: Cyclone and Electrostatic
- Power: 25 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 12m x 2.5m x 3.5m
- FOB Price: USD 20,000 – 35,000
- Gross Weight: ~ 8 ton

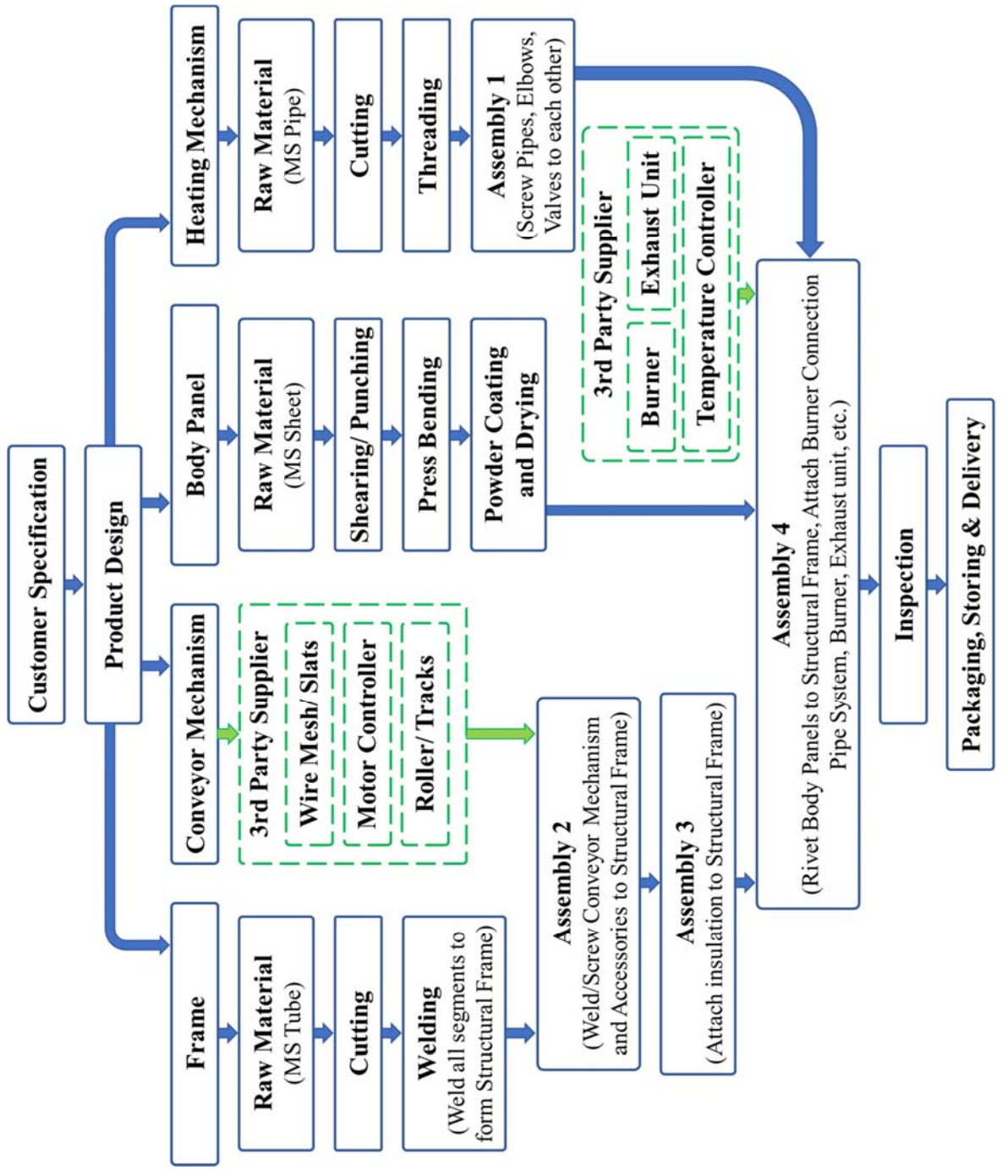
Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.





Bibliography:

- Boljanovic, Vukota, "Sheet Metal Forming Processes and Die Design", Industrial Press Inc., 2004.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.

Production Process Flow Chart:



Product-15: Spiral Mixer					
Sub-sector:	Food Processing				
HS-2007:	8438.20.00	BSIC-2009:	2825	BCPC-2011:	44516
Description:	A Spiral Mixer is a mixing equipment that mixes ingredients and prepares dough for food, chemical, ceramic, etc. industries.				
Product:					
Component:	1. Frame	2. Body Panel	3. Mixing Tub		
	4. Stirrer	5. Shield	6. Motor and Drive Mechanism		
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> MS Sheet (20 gauge/ 1 mm thick) 	<ul style="list-style-type: none"> SS Sheet (10 gauge/ 2.6 mm thick) 			
	<ul style="list-style-type: none"> MS Angle (40mm x 40mm; 3mm thick) 	<ul style="list-style-type: none"> SS Rod/ Wire (5 mm dia.) and (25 mm dia.) 			
Accessories:	<ul style="list-style-type: none"> Nut & Bolt 	<ul style="list-style-type: none"> Rubber Cork 	<ul style="list-style-type: none"> Gear, Pulley, Belt 		
	<ul style="list-style-type: none"> Motor 	<ul style="list-style-type: none"> Motor Controller 			
Raw Material Supplier:	<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. 				
Machineries, Equipment and Specification:					
1. Compound Miter Saw Machine (Circular Saw)					
		<ul style="list-style-type: none"> Blade: 254 mm O.D.; 25.4 mm Bore; Carbide No Load Speed: ~ 4,800 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Power: ~ 1.8 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.5m x 0.5m x 0.6m FOB Price: USD 250 – 400 (New) Gross Weight: ~ 15 kg 			

2. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 3 kW (220V, 1 Phase, 50 Hz) • Effective Input Current: ~ 10 – 30 A • OCV (MMAW/GTAW): 60/24 V DC • Output Current: 25 – 230 A • Duty Cycle (40°C, 10 min): 70 % • Dimension (LxWxH): 0.6m x0.3m x0.5m • FOB Price: USD 1,500 – 3,500 (New) • Gross Weight: ~ 25 kg
3. Hydraulic Shearing Machine	
	<ul style="list-style-type: none"> • Front Gauge Length: ~ 500 mm • Back Gauge Length: ~ 500 mm • Shear Length: ~ 2,000 mm • Blade Angle: ~ 0 – 3 Degree (Adjustable) • Sheet Thickness (MS/SS): Max. 5/3 mm • Stroke Rate: ~ 10 – 25 per minute • Power: ~ 12 kW (380V, 3 Phase) • Dimension (WxDxH): ~2.2m x 1.8m x 2m • FOB Price: USD 12,000-18,000 (New) • Gross Weight: ~ 5 ton
4. Sheet Bending Press Brake Machine	
	<ul style="list-style-type: none"> • Bending Length: 1,200 mm • Nominal Force: 200 ton • Throat Depth: ~ 200 mm • Beam Stroke: ~ 175 mm • Daylight: ~ 280 mm • Beam Descend/ Return Speed: ~ 100 mm/sec • Beam Bending Speed: ~ 0 – 10 mm/sec • Power: ~ 8 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 1.4m x 1.3m x 2m • FOB Price: USD 15,000 – 25,000 (New) • Gross Weight: ~ 4 ton
5. Roll Bending Machine	
	<ul style="list-style-type: none"> • Useful Roll Length: 1,020 mm • Material Thickness: Max. 2.5 mm • Roll Dia.: 130 mm • No. of Roll: 3/4 nos. • Bending Speed: 4.5 m/min • Power: ~ 2 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 1.8m x 0.6m x 1.2m • FOB Price: USD 10,000 – 12,000 (New) • Gross Weight: ~ 1.5 ton

6. Rod Bending Machine



- Bar Thickness Range: 2 – 10 mm
- Bar UTS Range: Max. 750 MPa
- Bending Angle: 0 – 180 Degree
- Bending Speed: 72 Degree/Second
- Power: ~ 5 kW (220V, 1 Phase, 50 Hz)
- Dimension (LxWxH): ~ 1m x 1m x 0.8m
- Optional Feature: Cutting
- FOB Price: USD 800 – 1,500 (New)
- Gross Weight: ~ 500 kg

7. Powder Coating Machine (Pre-Treatment, Coating, Curing)



- Part Opening Size: Max. 1.3 m x 1.5 m
- Coating Rated CFM: 6,000
- No. of Gun: 1 nos.
- Filter: 3 nos. (Length: 36 in.)
- Air Consumption (@100 psi): 12 SCFM
- Oven Heating Method: Infrared
- Power: ~ 6 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 1.5m x 2m x 2.5m
- FOB Price: USD 12,000 – 15,000
- Gross Weight: ~ 2 ton

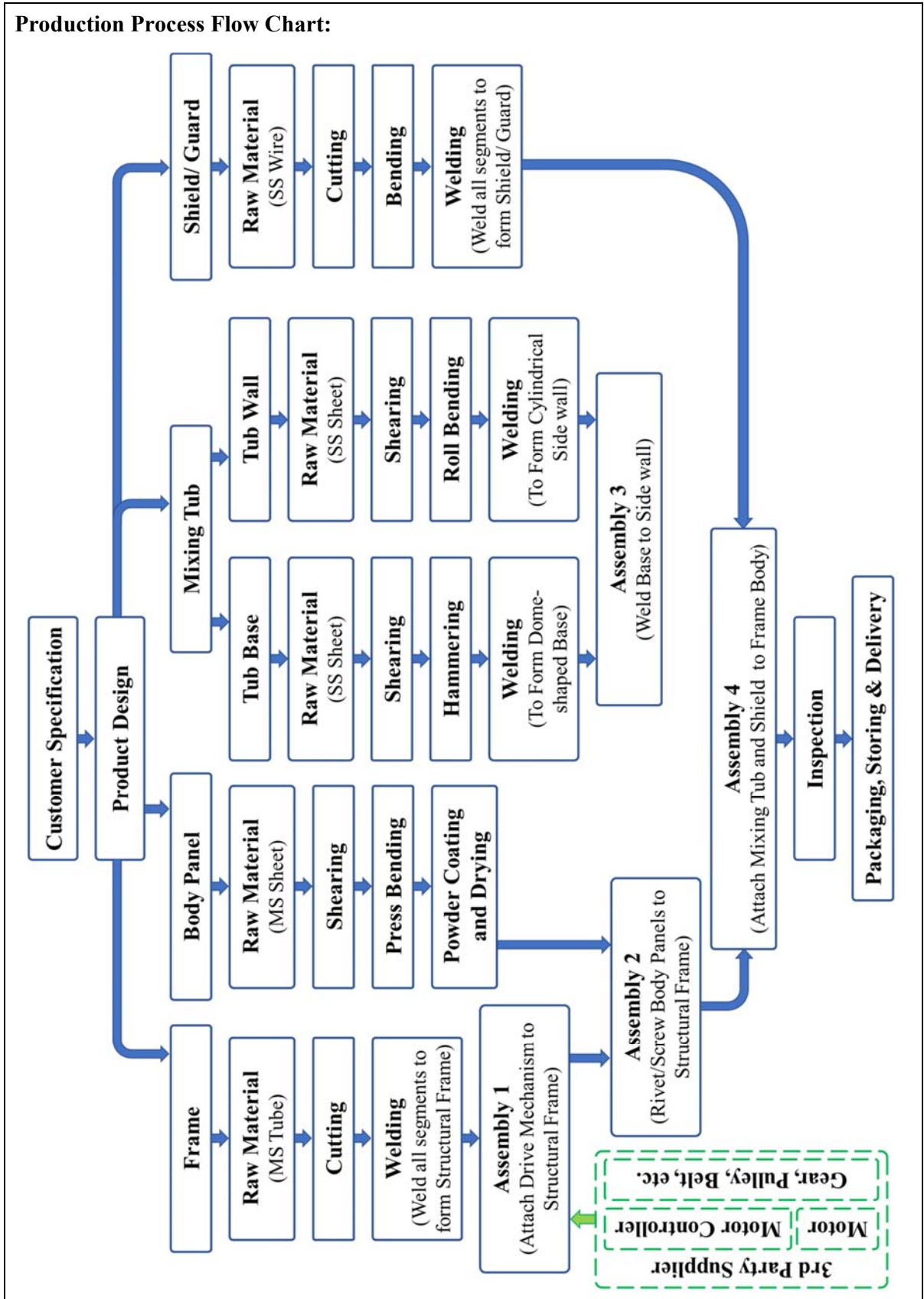
Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants’ Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.

Bibliography:

- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Rowe, Geoffrey W., “Principles of Industrial Metalworking Processes”, Crane Russak & Co., 1977.

Production Process Flow Chart:



Product-16: Dough Sheeter

Sub-sector: Food Processing

HS-2007: 8438.10.00 **BSIC-2009:** 2825 **BCPC-2011:** 44516

Description:
A dough sheeter is an equipment that rolls out pieces of dough into a smooth continuous sheet of desired uniform thickness consistently.



Component: 1. Frame 2. Body Panel 3. Rolling Mechanism

Raw Materials:


Base Raw Material:	• SS Tube (40mm x 40mm; 1.5mm thick)	• SS Sheet (20 gauge/ 1 mm thick)	
	• SS Bar (40mm x 40mm; 3mm thick)	• SS Rod/ Wire (5 mm dia.) and (25 mm dia.)	
Accessories:	• Nut & Bolt	• Rubber Cork	• Gear, Pulley, Belt
	• Motor	• Motor Controller	• Bearing





Raw Material Supplier:

- Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677.

Machineries, Equipment and Specification:

1. Compound Miter Saw Machine (Circular Saw)

	<ul style="list-style-type: none"> • Blade: 254 mm O.D.; 25.4 mm Bore; Carbide • No Load Speed: ~ 4,000 rpm • Miter Range: 45 Degree (Left & Right) • Bevel Range: 45 Degree (Left & Right) • Optional: Dust/Chips Collector • Power: ~ 1.8 kW (220V, 1 Phase, 50 Hz) • Dimension (LxWxH): ~ 0.8m x 0.6m x 0.5m • FOB Price: USD 300 – 450 (New) • Gross Weight: ~ 30 kg
---	---

2. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 3 kW (220V, 1 Phase, 50 Hz) • Effective Input Current: ~ 10 – 30 A • OCV (MMAW/GTAW): 80/30 V DC • Output Current: 20 – 210 A • Duty Cycle (40°C, 10 min): Adjustable • Dimension (LxWxH): 0.6m x0.3m x0.5m • FOB Price: USD 800 – 2,000 (New) • Gross Weight: ~ 22 kg
3. Hydraulic Shearing Machine	
	<ul style="list-style-type: none"> • Front Gauge Length: ~ 300 mm • Back Gauge Length: ~ 500 mm • Shear Length: ~ 1,500 mm • Blade Angle: ~ 0 – 3 Degree (Adjustable) • Sheet Thickness (MS/SS): Max. 5/3 mm • Stroke Rate: ~ 10 – 25 per minute • Power: ~ 8 kW (380V, 3 Phase) • Dimension (WxDxH): ~1.6m x 1m x 1.3m • FOB Price: USD 8,000-10,000 (New) • Gross Weight: ~ 2.5 ton
4. Sheet Bending Press Brake Machine	
	<ul style="list-style-type: none"> • Bending Length: 1,000 mm • Nominal Force: 120 ton • Throat Depth: ~ 200 mm • Beam Stroke: ~ 150 mm • Daylight: ~ 250 mm • Beam Descend/ Return Speed: ~ 90 mm/sec • Beam Bending Speed: ~ 0 – 8 mm/sec • Power: ~ 12 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 1.2m x 1.5m x 2.2m • FOB Price: USD 12,000 – 20,000 (New) • Gross Weight: ~ 4 ton
5. CNC Lathe Machine (CNC Horizontal Turning Center)	
	<ul style="list-style-type: none"> • No. of Axis: 3 (X, Z, C) • Swing Over Bed: ~ 600 mm • Max. Turning Dia.: ~ 430 mm • Max. Turning Length: ~ 600 mm • Chuck Size: ~ 8 – 12 in. • Spindle Power: ~ 25 kW (6,000 rpm) • Bar Capacity/ Spindle Bore: ~ 75 mm • Tool Stations: 8 nos. • Dimensions (LxWxH): ~ 2.5m x 2m x 2m • FOB Price: USD 50,000 – 80,000 (New) • Gross Weight: ~ 10 ton

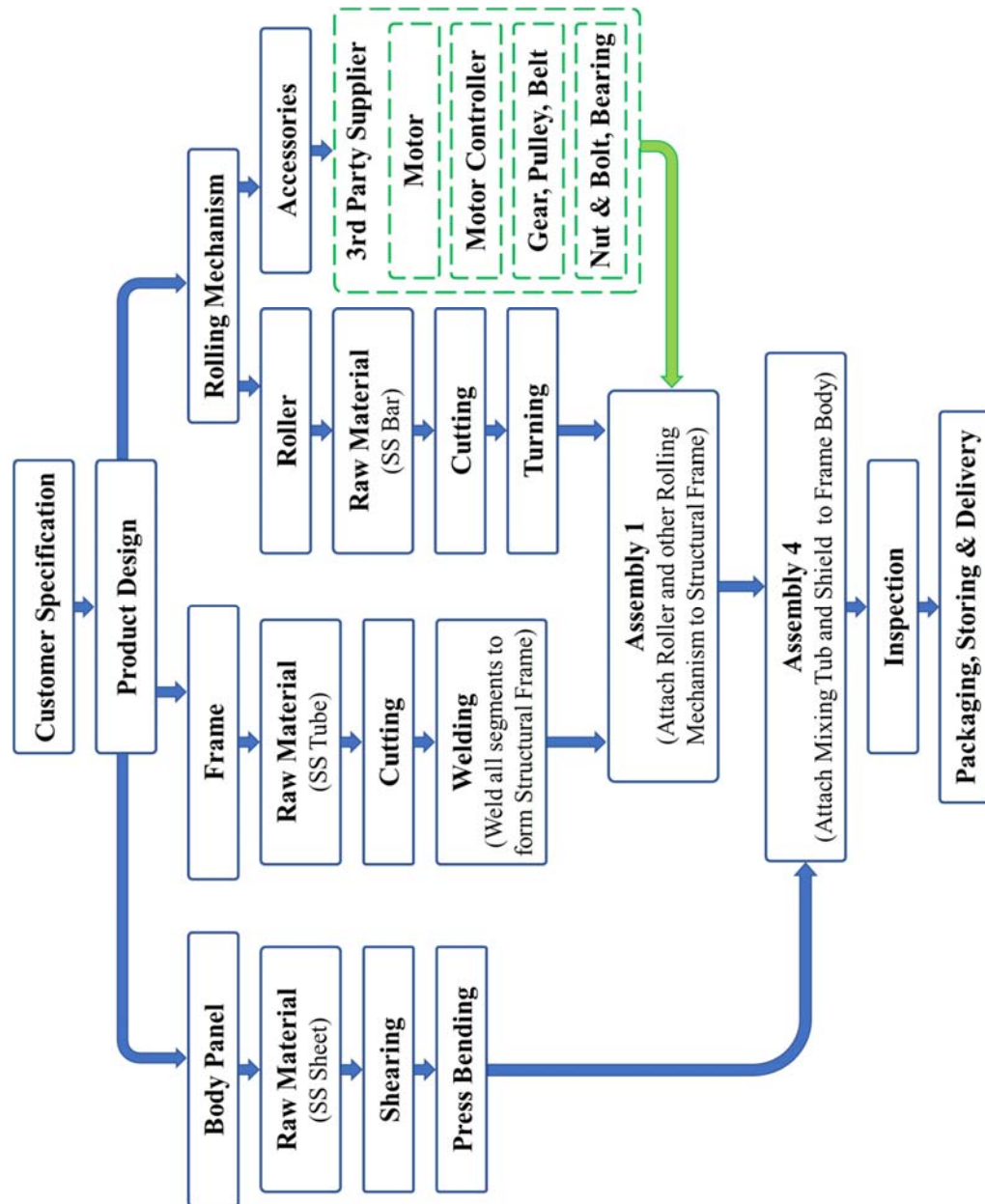
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.





Bibliography:

- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.

Production Process Flow Chart:



Product-17: Hand Sieve					
Sub-sector:	Food Processing				
HS-2007:	9604.00.90	BSIC-2009:	3290	BCPC-2011:	38999
Description: A Sieve or Sifter or Riddle is a device consisting of a wire or plastic mesh held in a frame used for straining solids from liquids, for separating coarser from finer particles, or for reducing soft solids to a pulp.					
Product:					
Component:	1. Frame	2. Mesh	3. Hook		
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> SS Sheet (20 gauge/ 1 mm thick) 		<ul style="list-style-type: none"> SS Wire (3 mm dia.) 		
	<ul style="list-style-type: none"> SS Mesh (40/50 Mesh) 				
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. Hydraulic Shearing Machine (Straight Shear)					
			<ul style="list-style-type: none"> Front Gauge Length: ~ 500 mm Back Gauge Length: ~ 400 mm Shear Length: ~ 1,000 mm Blade Angle: ~ 0 – 3 Degree (Adjustable) Sheet Thickness (MS/SS): Max. 5/3 mm Stroke Rate: ~ 5 – 15 per minute Power: ~ 1.5 kW (380V, 3 Phase) Dimension (WxDxH): ~1.2m x 0.8m x 1.3m FOB Price: USD 10,000-12,000 (New) Gross Weight: ~ 2 ton 		

2. Hydraulic Shearing Machine (Circular Shear)	
	<ul style="list-style-type: none"> Accepted Sheet Thickness: 2 mm (700 MPa) Circular Blank Dia.: 80 – 1,000 mm Jaw Capacity (Knife/Guide): 350/750 mm External Flanging (Dia. x H): 130 x 20 mm Internal Flanging (Dia. x H): 600 x 20 mm Working Speed: 30 m/min Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (WxDxH): 2.4m x 0.8m x 1.5m FOB Price: USD 8,000 – 12,000 (New) Gross Weight: ~ 0.5 ton
3. Roll Bending Machine	
	<ul style="list-style-type: none"> Useful Roll Length: 1,000 mm Material Thickness (SS): Max. 3 mm Roll Dia.: 150 mm No. of Roll: 3/4 nos. Bending Speed: 5 m/min Power: ~ 3 kW (400V, 3 Phase, 50 Hz) Dimension (WxDxH): 2m x 1m x 1.5m FOB Price: USD 12,000 – 15,000 (New) Gross Weight: ~ 2 ton
4. Swaging/ Beading Machine	
	<ul style="list-style-type: none"> Material Thickness (SS): Max. 2.5 mm Operation Stage: Trimming, Beading, Seaming, Ribbing, Curling, Flanging, etc. Throat Depth: ~ 280 mm Cylinder Length: ~ 200 mm Cylinder Speed: 10 - 50 rpm Power: ~ 2 kW (220V, 3 Phase, 50 Hz) Dimension (LxWxH): ~ 1.4m x 0.5m x 1.2m FOB Price: USD 3,000 – 8,000 (New) Gross Weight: ~ 0.3 ton
5. Hole Punching Machine	
	<ul style="list-style-type: none"> Material Thickness (SS): Max. 16 mm Throat Depth: ~ 110 mm Punch Hole Dia.: Max. 27 mm Punching Time: 8 sec. Punching Force: 40 ton Hydraulic Pump Output: 1.5 l/min. (700 bar) Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.5m x 0.1m x 0.4m FOB Price: USD 500 – 1,000 (New) Gross Weight: ~ 20 kg

6. Wire Bending Machine



- Wire Dia. (SS): Max. 8 mm
- Radius Capacity: Min. 5 mm, Max. 50 mm
- Center Pin Hole Dia.: 20 mm
- Operating Leverage: 350 mm
- Dimension (LxWxH): ~ 0.5m x 0.6m x 1.5m
- FOB Price: USD 500 – 1,200
- Gross Weight: ~ 12 kg

7. Riveting Machine



- Workpiece Material Thickness: Max. 5 mm
- Riveting Method: Spin/ Orbital
- Riveting Capacity: Max. 6 mm dia.
- Throat Depth: Max. 450 mm
- Shut Length: Max. 175 mm
- Stroke Distance: Max. 120 mm
- Axial Force: Max. 4 ton
- Power: 3 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 1.1m x 0.7m x 2m
- FOB Price: USD 2,500 – 3,500
- Gross Weight: ~ 0.4 ton

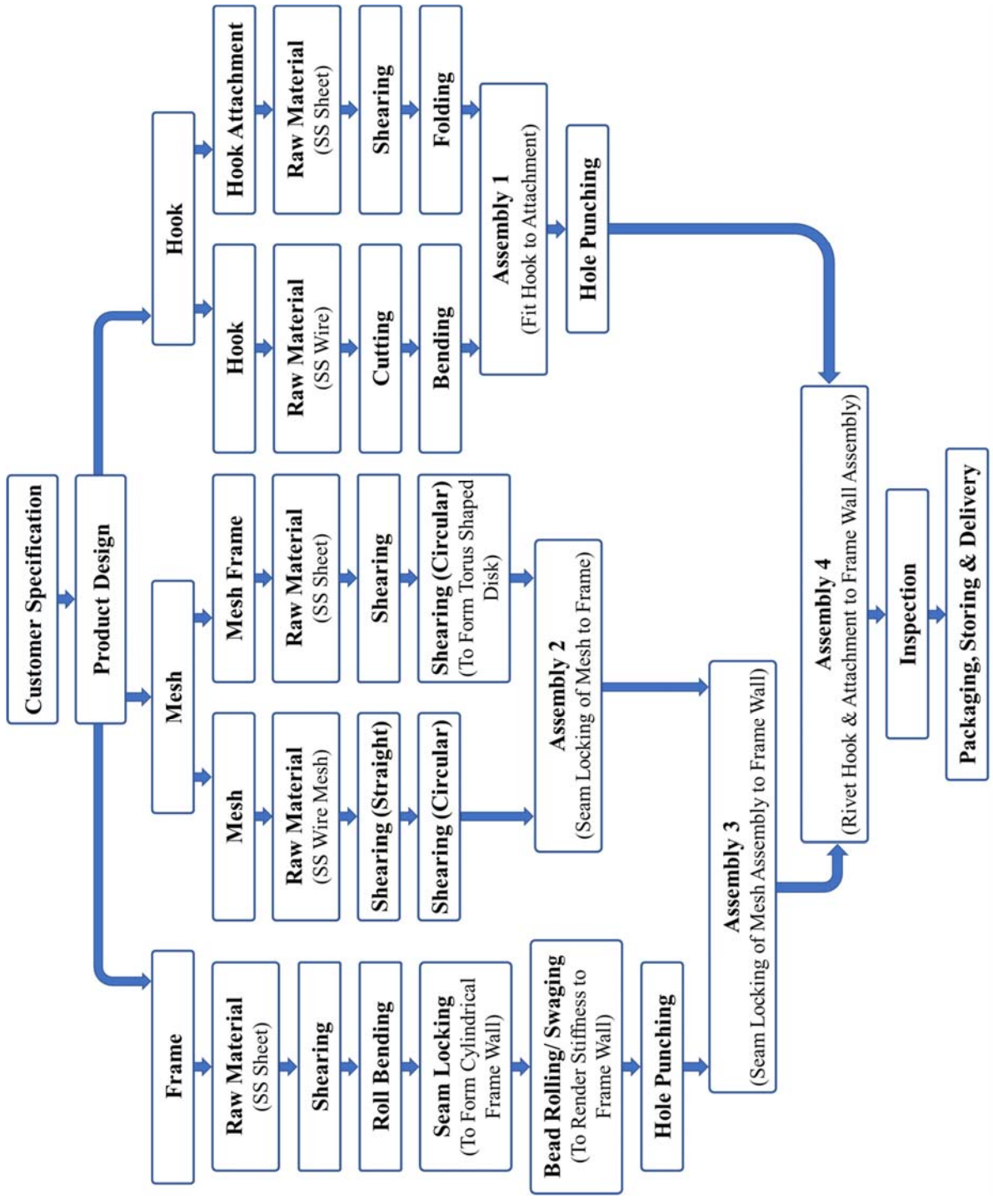
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.





Bibliography:

- Banabic, Dorel, "Sheet Metal Forming Processes", Springer-Verlag Berlin Heidelberg, 2010.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Rowe, Geoffrey W., "Principles of Industrial Metalworking Processes", Crane Russak & Co., 1977.

Production Process Flow Chart:



Product-18: Cylinder Trolley			
Sub-sector:	Furniture (Medical)		
HS-2007:	8427.90.00	BSIC-2009:	2816
		BCPC-2011:	43530
Description:			
It is an L-shaped hand truck/ trolley that has handle at top end and wheels at the base with a toe plate on which the item to be moved is placed.			
Product:			
Component:	1. Body	2. Transport Mechanism	3. Base Plate
Raw Materials:			
Base Raw Material:	<ul style="list-style-type: none"> MS Round Tube (O.D.: 25mm, Thickness: 2 mm) 	<ul style="list-style-type: none"> MS Plate (Thickness: 3mm) 	
	<ul style="list-style-type: none"> MS Flat Strip (Width: 25mm, Thickness: 2 mm) 		
Accessories:	<ul style="list-style-type: none"> Wheel & Axle 	<ul style="list-style-type: none"> Nut & Bolt, Bearing 	
Raw Material Supplier:			
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 			
Machineries, Equipment and Specification:			
1. Compound Miter Saw Machine (Circular Saw)			
		<ul style="list-style-type: none"> Blade: 254 mm O.D.; 25.4 mm Bore; Carbide Speed: ~ 3,000 rpm Miter Range: 45 Degree (Left & Right) Bevel Range: 45 Degree (Left & Right) Power: ~ 2 kW (220V, 1 Phase, 50 Hz) Dimension (LxWxH): ~ 0.8m x 0.6m x 0.6m FOB Price: USD 400 – 800 (New) Gross Weight: ~23 kg 	

2. CNC Tube Bending Machine	
	<ul style="list-style-type: none"> • Tube Dia.: Max. 40 mm • Tube Wall Thickness: 2 mm (700 MPa) • Bending Radius: 100 – 250 mm • Bending Angle: Max. 190 Degrees • Bending Speed: 35 Degrees/sec. • Feed Speed: 1,000 mm/sec. • Oil Tank Capacity: 120 l (140 bar) • Power: ~ 12 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 5m x 1.5m x 1.4m • FOB Price: USD 25,000 – 45,000 (New) • Gross Weight: ~ 3.5 ton
3. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 3 kW (380V, 3 Phase, 50 Hz) • Effective Input Current: ~ 10 – 30 A • OCV (MMAW/GTAW): 65/10 V DC • Output Current: 30 – 650 A • Duty Cycle (40°C, 10 min): Adjustable • Dimension (LxWxH): 0.8m x 0.7m x 1.5m • FOB Price: USD 1,500 – 4,000 (New) • Gross Weight: ~ 70 kg
4. Hydraulic Sheet/Plate Shearing Machine	
	<ul style="list-style-type: none"> • Back Gauge Length: ~ 500 mm • Shear Length: Max. 1,000 mm • Blade Angle Adjustment: 0.5 – 3 Degrees • Blade Gap Adjustment: 5 – 20 mm, Manual • Shearing Thickness (SS): Max. 4 mm • Power: ~ 5 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 1.2m x 1m x 1.8m • FOB Price: USD 18,000 – 25,000 (New) • Gross Weight: ~ 5 ton
5. Manual Strip Bending Machine	
	<ul style="list-style-type: none"> • Strip Thickness (SS): Max. 5 mm • Radius Capacity: Min. 5 mm, Max. 50 mm • Center Pin Hole Dia.: 25 mm • Operating Leverage: 500 mm • Dimension (LxWxH): ~ 0.6m x 0.5m x 1.5m • FOB Price: USD 800 – 1,500 • Gross Weight: ~ 10 kg

6. Powder Coating Machine (Pre-Treatment, Coating, Curing, Conveyor Line)



- Part Opening Size: Max. 1.3 m x 1.5 m
- Coating Rated CFM: 6,000
- No. of Gun: 1 nos.
- Filter: 3 nos. (Length: 36 in.)
- Air Consumption (@100 psi): 12 SCFM
- Oven Heating Method: Infrared
- Power: ~ 6 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 1.5m x 2m x 2.5m
- FOB Price: USD 12,000 – 15,000
- Gross Weight: ~ 2 ton

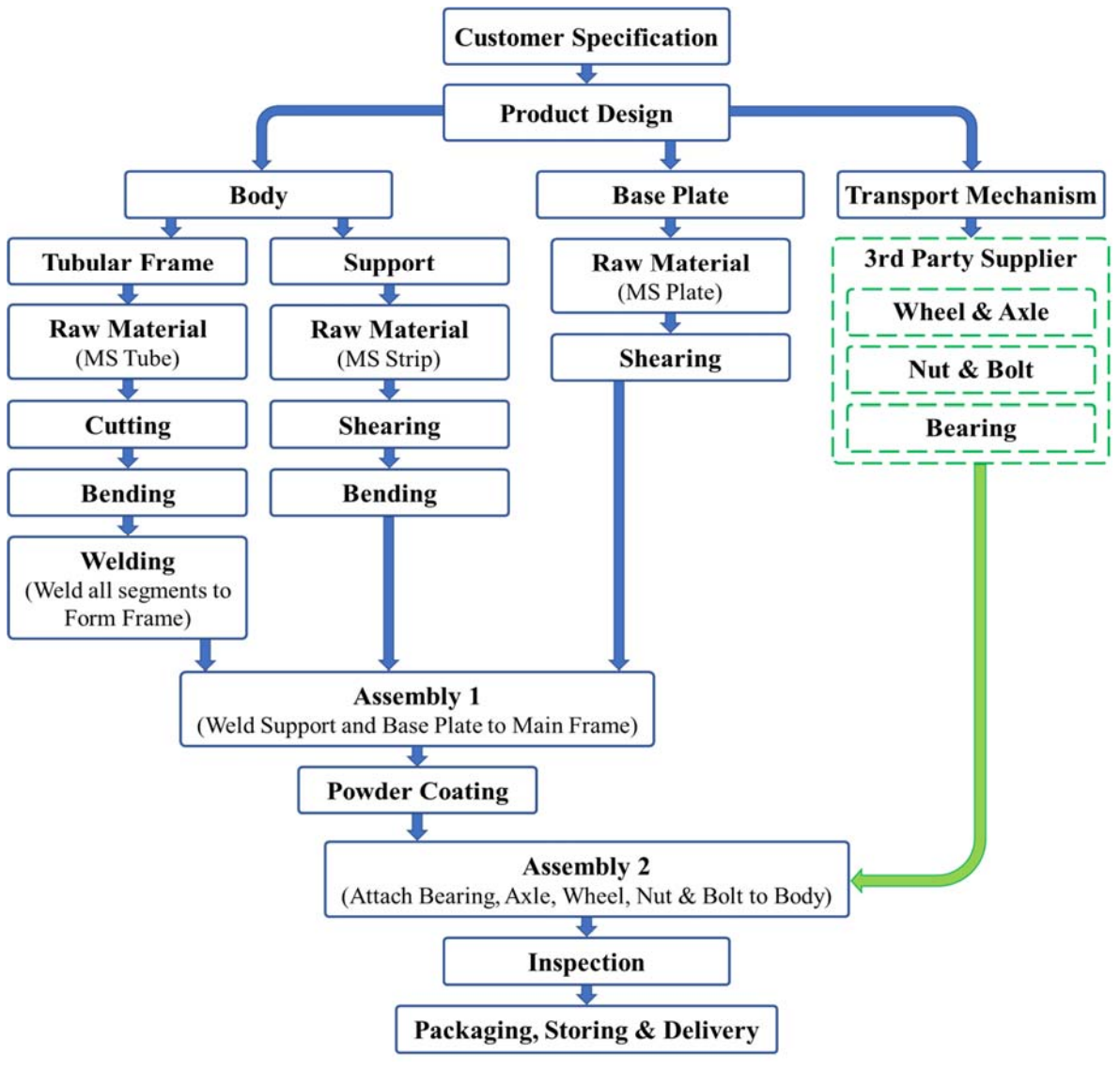
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.





Bibliography:

- Banabic, Dorel, "Sheet Metal Forming Processes", Springer-Verlag Berlin Heidelberg, 2010.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Beddoes, J., Bibby, M., "Principles of Metal Manufacturing Processes", Butterworth-Heinemann, 1999.

Production Process Flow Chart:



Product-19: Hospital Bed					
Sub-sector:	Furniture (Medical)				
HS-2007:	9402.90.10	BSIC-2009:	3250	BCPC-2011:	48180
Description:					
A Hospital Bed or Hospital Cot or Fowler Bed is an ergonomically designed multi-section bed used for comfort and well-being of hospitalized patients and convenience of healthcare workers.					
Product:					
Component:	1. Structural Frame	2. Multi-section Bed	3. Guardrails and Panels		
	4. Wheels/Castors	5. Attachments	6. Cranking Mechanism		
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> MS Rectangular Tube (80mm x 40mm; 2mm thick) 		<ul style="list-style-type: none"> SS Round Tube (O.D.: 25 mm; Thickness: 2 mm) 		
	<ul style="list-style-type: none"> MS Sheet (Thickness: 1.5 mm/ 16 gauge) 				
Accessories:	<ul style="list-style-type: none"> Wheel/ Castor 	<ul style="list-style-type: none"> Nut & Bolt, Bearing 	<ul style="list-style-type: none"> Springs 		
	<ul style="list-style-type: none"> Motor/ Actuator and Controller 	<ul style="list-style-type: none"> Guide Screw, Roller, Fastener 			
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. Miter Band Saw Machine					
		<ul style="list-style-type: none"> Blade Size (LxW): ~ 5,000 mm x 34 mm Blade Thickness: 0.8 mm Blade Speed: 100 – 300 rpm Cutting Range (@ 90 Degree): <ul style="list-style-type: none"> ○ Circular: Max. Dia. 400 mm ○ Rectangular: Max. 400 mm x 1,000 mm Power: ~ 8 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 2.5m x 2.2m x 1.6m FOB Price: USD 15,000 – 18,000 (New) Gross Weight: ~ 2 ton 			

2. Multi-Head Drill Machine	
	<ul style="list-style-type: none"> • No. of Spindle: 1 – 5 nos. (1 Drill/ Spindle) • Spindle Center-Center Distance: Min.100 mm • Spindle Rotation Speed: 200 – 3,000 rpm • Spindle Travel: Max. 200 mm • Drilling Dia.: 5 – 40 mm • Carriage Travel Speed: 50 m/min • Power: ~ 8 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 2.8m x 1.2m x 2m • FOB Price: USD 8,000 – 10,000 (New) • Gross Weight: ~ 2 ton
3. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 5 kW (400V, 3 Phase, 50 Hz) • Effective Input Current: ~ 10 – 40 A • OCV (MMAW/GTAW): 86/27 V DC • Output Current: 20 – 500 A • Duty Cycle (40°C, 10 min): Adjustable • Dimension (LxWxH): 0.6m x0.3m x1m • FOB Price: USD 1,500 – 3,000 (New) • Gross Weight: ~ 60 kg
4. Hydraulic Sheet Shearing Machine	
	<ul style="list-style-type: none"> • Back Gauge Length: ~ 500 mm • Shear Length: Max. 2,500 mm • Blade Angle Adjustment: 0.5 – 2.5 Degrees • Blade Gap Adjustment: 5 – 20 mm, Manual • Stroke Rate: 15 nos./min • Shearing Thickness (SS): Max. 4 mm • Power: ~ 10 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 3m x 1.6m x 2m • FOB Price: USD 18,000 – 20,000 (New) • Gross Weight: ~ 5.5 ton
5. CNC Turret Punch Press Machine	
	<ul style="list-style-type: none"> • Punch Force: ~ 50 ton • Capacity (Thickness, X, Y): 6mm, 1.2m, 2m • Velocity (X & Y, A): 70 m/min, 100 rpm • Punch Stroke Rate: ~ 300 – 700 nos./min • Stroke Distance: Max. 40 mm • Motor Power: ~ 15 kW • Oil Capacity: 300 liters • Options: Clamping, Laser/ Plasma Cutter, etc. • Dimension (LxWxH): ~ 4.2m x 4m x 2.2m • FOB Price: USD 35,000 – 80,000 • Gross Weight: ~ 10 ton

6. Sheet Bending Press Brake Machine



- Bending Length: Max. 2,500 mm
- Nominal Force: 150 ton
- Throat Depth: ~ 400 mm
- Beam Stroke: ~ 250 mm
- Daylight: ~ 430 mm
- Beam Descend/Return Speed: ~ 200 mm/min
- Beam Bending Speed: ~ 0 – 20 mm/min
- Power: ~ 35 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): 3m x 1.6m x 2.5m
- FOB Price: USD 30,000 – 50,000 (New)
- Gross Weight: ~ 8 ton

7. Powder Coating Machine (Pre-Treatment, Coating, Curing, Conveyor Line)



- Part Opening Size: Max. 1.3 m x 1.5 m
- Coating Rated CFM: 6,000
- No. of Gun: 1 nos.
- Filter: 3 nos. (Length: 36 in.)
- Air Consumption (@100 psi): 12 SCFM
- Oven Heating Method: Infrared
- Power: ~ 6 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 1.5m x 2m x 2.5m
- FOB Price: USD 12,000 – 15,000
- Gross Weight: ~ 2 ton

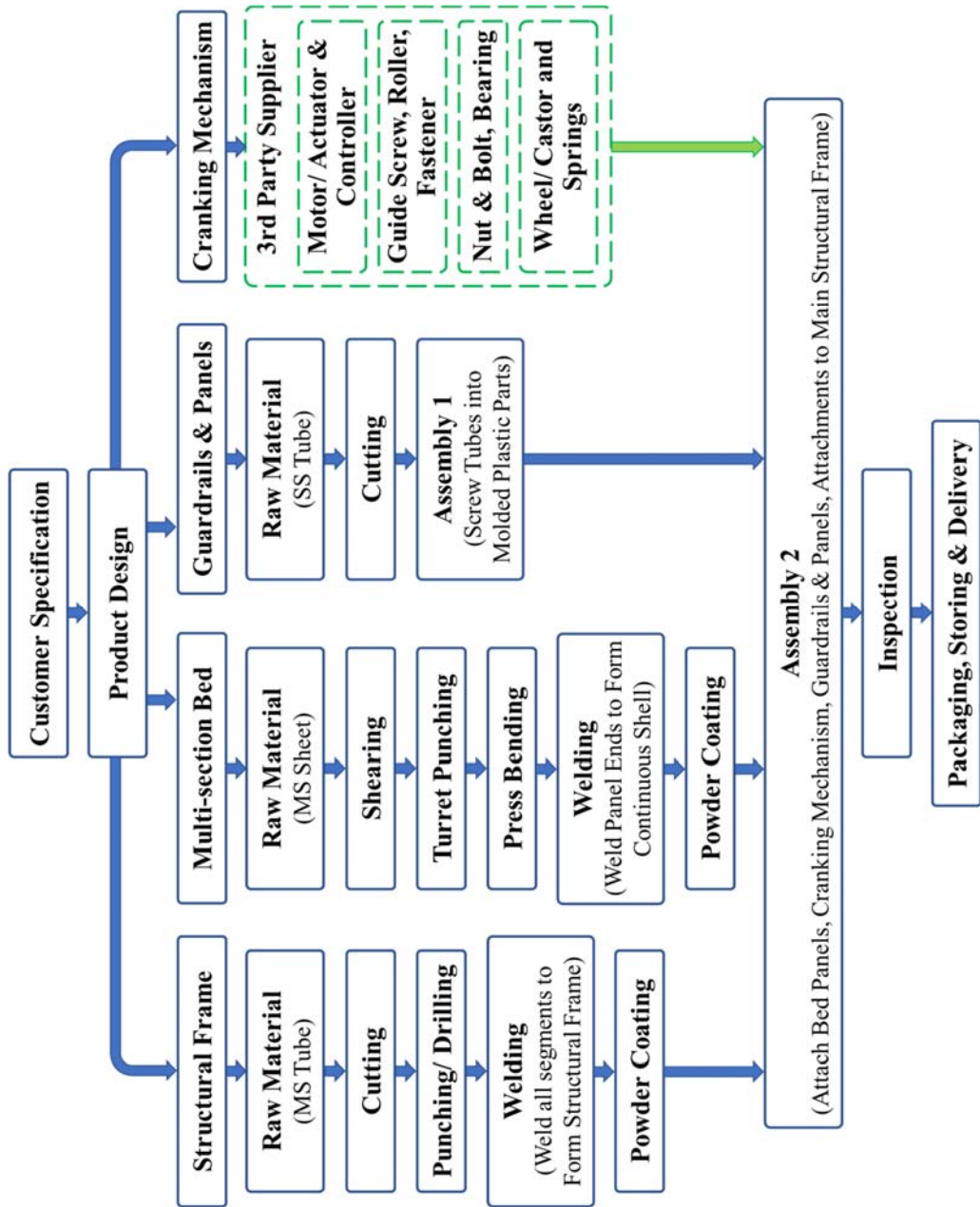
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.





Bibliography:

- Banabic, Dorel, "Sheet Metal Forming Processes", Springer-Verlag Berlin Heidelberg, 2010.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Beddoes, J., Bibby, M., "Principles of Metal Manufacturing Processes", Butterworth-Heinemann, 1999.

Production Process Flow Chart:



Product-20: File Cabinet					
Sub-sector:	Furniture (Office)				
HS-2007:	9403.10.00	BSIC-2009:	3100	BCPC-2011:	38121
Description:					
A File Cabinet is a piece of office furniture usually used to store paper documents in file folders.					
Product:					
Component:	1. Structural Frame	2. Body Panels	3. Drawers		
	4. Guiderails	5. Handle & Lock			
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> MS Rectangular Tube (80mm x 40mm; 2mm thick) 		<ul style="list-style-type: none"> MS Sheet (Thickness: 1.5 mm/ 16 gauge) 		
Accessories:	<ul style="list-style-type: none"> Handle 	<ul style="list-style-type: none"> Lock 	<ul style="list-style-type: none"> Name Tag 	<ul style="list-style-type: none"> Guiderails 	
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. Miter Band Saw Machine					
			<ul style="list-style-type: none"> Blade Size (LxW): ~ 5,000 mm x 20 mm Blade Thickness: 0.8 mm Blade Speed: 80 – 250 rpm Cutting Range (@ 90 Degree): <ul style="list-style-type: none"> o Circular: Max. Dia. 350 mm o Rectangular: Max. 350 mm x 800 mm Power: ~ 5 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 3m x 2m x 2m FOB Price: USD 12,000 – 20,000 (New) Gross Weight: ~ 2.5 ton 		

2. Multi-Head Drill Machine	
	<ul style="list-style-type: none"> • No. of Spindle: 1 – 5 nos. (1 Drill/ Spindle) • Spindle Center-Center Distance: Min. 200mm • Spindle Rotation Speed: 150 – 2,500 rpm • Spindle Travel: Max. 180 mm • Drilling Dia.: 3 – 50 mm • Carriage Travel Speed: 45 m/min • Power: ~ 7 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 2.6m x 1m x 1.8m • FOB Price: USD 6,000 – 10,000 (New) • Gross Weight: ~ 1 ton
3. Multi-Process Welding Machine	
	<ul style="list-style-type: none"> • Process: TIG, MIG, MMA • Power: ~ 5 kW (400V, 3 Phase, 50 Hz) • Effective Input Current: ~ 15 – 50 A • OCV (MMAW/GTAW): 60/24 V DC • Output Current: 10 – 400 A • Duty Cycle (40°C, 10 min): Adjustable • Dimension (LxWxH): 0.5m x 0.7m x 1.5m • FOB Price: USD 1,000 – 2,000 (New) • Gross Weight: ~ 50 kg
4. Hydraulic Sheet Shearing Machine	
	<ul style="list-style-type: none"> • Back Gauge Length: ~ 600 mm • Shear Length: Max. 2,500 mm • Blade Angle Adjustment: 0.5 – 2 Degrees • Blade Gap Adjustment: 3 – 15 mm, Manual • Stroke Rate: 20 nos./min • Shearing Thickness (SS): Max. 3 mm • Power: ~ 8 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 2.5m x 1.8m x 2.2m • FOB Price: USD 20,000 – 35,000 (New) • Gross Weight: ~ 6 ton
5. Sheet Bending Press Brake Machine	
	<ul style="list-style-type: none"> • Bending Length: Max. 2,500 mm • Nominal Force: 180 ton • Throat Depth: ~ 300 mm • Beam Stroke: ~ 200 mm • Daylight: ~ 450 mm • Beam Descend/Return Speed: ~ 150 mm/min • Beam Bending Speed: ~ 0 – 15 mm/min • Power: ~ 30 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 2.8m x 1.8m x 3m • FOB Price: USD 25,000 – 60,000 (New) • Gross Weight: ~ 10 ton

6. Powder Coating Machine (Pre-Treatment, Coating, Curing, Conveyor Line)



- Part Opening Size: Max. 1.3 m x 1.5 m
- Coating Rated CFM: 6,000
- No. of Gun: 1 nos.
- Filter: 3 nos. (Length: 36 in.)
- Air Consumption (@100 psi): 12 SCFM
- Oven Heating Method: Infrared
- Power: ~ 6 kW (220V, 1 Phase, 50 Hz)
- Dimension (WxDxH): ~ 1.5m x 2m x 2.5m
- FOB Price: USD 12,000 – 15,000
- Gross Weight: ~ 2 ton

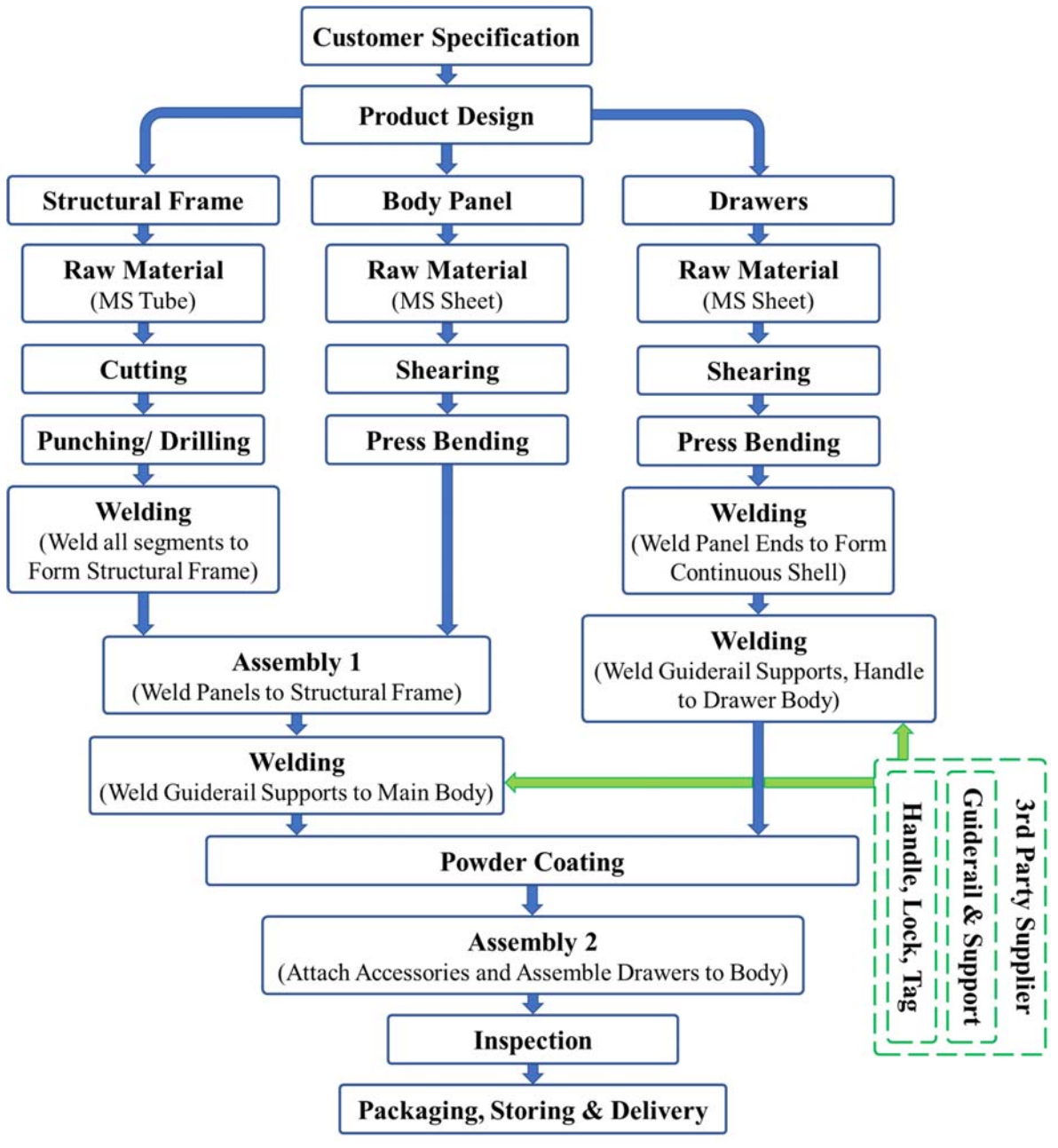
Machineries Supplier:


- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.





Bibliography:

- Kawalla, R., Grechnikov, F. V., Nosova, E. A., and Erisov, Y. A., "Advanced Materials and Processes of Metalworking II", Trans Tech Publications, 2017.
- Hingole, R. S., "Advances in Metal Forming", Springer-Verlag Berlin Heidelberg, 2015.
- Mielnik, Edward M., "Metalworking Science and Engineering", McGraw-Hill, 1991.

Production Process Flow Chart:



Product-21: Tweezer					
Sub-sector:	Tool				
HS-2007:	8203.20.00	BSIC-2009:	2593	BCPC-2011:	42921
Description:					
A Tweezer is a small hand tool used to grasp, pick, pull or pluck small objects that are difficult to handle with human hand.					
Product:					
Component:	1. Arms				
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> SS Wire (Dia.: 10 mm) 				
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. De-coiler Machine					
			<ul style="list-style-type: none"> Wire Thickness: 5 – 20 mm Wire Coil Inner Dia.: ~ 400 – 550 mm Wire Coil Outer Dia.: ~ 1,500 mm Wire Coil Weight: Max. 5 ton Expansion System: Hydraulic Power: ~ 5 kW (380V, 3 Phase, 50 Hz) Dimensions (LxWxH): ~ 2.5m x 2m x 2m FOB Price: USD 3,500 – 6,000 (New) Gross Weight: ~ 1.5 ton 		

2. Straightening Machine	
	<ul style="list-style-type: none"> • Straightening Dia.: 5 – 15 mm (500 MPa) • Straightening Rolls: 34 pcs • Straightening Speed: ~ 50 m/min • Power: ~ 8 kW (380V, 3 Phase, 50 Hz) • Dimensions (LxWxH): ~ 3m x 1m x 1.6m • FOB Price: USD 5,000 – 8,000 (New) • Gross Weight: ~ 2.5 ton
3. Blanking Press Machine	
	<ul style="list-style-type: none"> • Nominal Force: ~ 160 ton • Slide Stroke Distance: 16.5 – 150 mm • Stroke Rate: 35 – 60 nos./min • Depth of Throat: ~ 350 mm • Table Size (WxD): ~ 1,000 mm x 650 mm • Punch Hole Dia.: ~ 70 mm • Motor Power: ~15kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): 1.5m x 2.2m x 3.5m • FOB Price: USD 18,000 – 30,000 (New) • Gross Weight: ~ 15 ton
4. Spot Welding Machine	
	<ul style="list-style-type: none"> • Duty Cycle (40°C, 10 min): 50% • Power: 50 kVA (400V, 3 Phase, 50 Hz) • Output Current: 10,000 – 20,000 A • Throat (Depth, Opening): 600 mm, 170 mm • Tip Holder (Dia., Length): 25 mm, 250 mm • Tip (Dia., Taper): 16 mm, 1/5 mm • Electrode (Force, Stroke): 500 kg, 60mm • Cooling Water Consumption: ~ 10 liter/min • Dimension (WxDxH): ~ 0.7m x 1m x 1.6m • FOB Price: USD 1,500 – 3,000 (New) • Gross Weight: ~ 0.3 ton
5. Deburring Machine/ Vibratory Finishing Machine	
	<ul style="list-style-type: none"> • Total Volume: ~ 1,000 liter • Deburring Media: Ceramic Chips • Deburring Media Capacity: ~ 700 kg • Bowl Diameter: ~ 1,500 mm • Motor: 5 HP • Output: Max. 1 ton/hr • Dimension (LxWxH): ~ 1.8m x 1.5m x 1.6m • FOB Price: USD 3,000 – 6,000 (New) • Gross Weight: ~ 1 ton

6. Abrasive Belt Grinding Machine

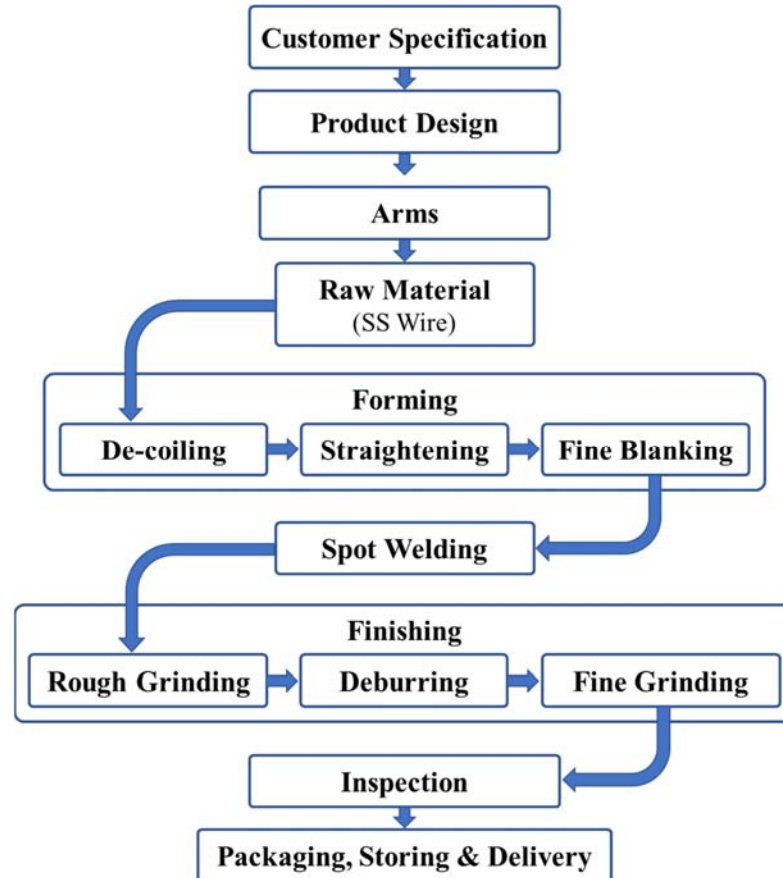


- Power: ~ 3 kW (400V, 3 Phase, 50 Hz)
- No Load Speed: ~ 3,000 rpm
- Belt Dimension (LxW): 2,000mm x 75mm
- Wheel Dimension (Dia.xH): 200mm x 75mm
- Center-Center Distance: 600mm
- Dimension (WxDxH): 0.7m x 0.3m x 1.2m
- FOB Price: USD 1,000 – 2,500 (New)
- Gross Weight: ~ 35 kg

Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Production Process Flow Chart:



Bibliography:

- Kawalla, R., Grechnikov, F. V., Nosova, E. A., and Erisov, Y. A., “Advanced Materials and Processes of Metalworking II”, Trans Tech Publications, 2017.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.

Product-22: Wrench					
Sub-sector:	Tool				
HS-2007:	8204.11.00	BSIC-2009:	2593	BCPC-2011:	42921
Description:					
A Wrench or Spanner is a tool used to grip, fasten, turn, tighten and loosen items like nuts and bolts, pipe fittings, etc.					
Product:					
Component:	1. Body (Arm and Hook)				
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> MS Round Billet (Dia.: 75 mm) 				
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. Band Saw Machine					
			<ul style="list-style-type: none"> Blade Size (LxW): ~ 5,000 mm x 34 mm Blade Thickness: 0.8 mm Blade Speed: 100 – 300 rpm Cutting Range (@ 90 Degree): <ul style="list-style-type: none"> Circular: Max. Dia. 400 mm Rectangular: Max. 400 mm x 1,000 mm Power: ~ 8 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 2.5m x 2.2m x 1.6m FOB Price: USD 15,000 – 18,000 (New) Gross Weight: ~ 2 ton 		

2. Induction Bar Heater



- Section Type: Round, Square, Profile
- Technology: IBT Transistor or Thyristor
- Frequency: 500 – 50,000 Hz
- Heating Capacity: 1.5 ton/hr
- Energy Usage (Steel-1250°C): 400 kWh/T
- Power: 600 kVA (400V, 3 Phase, 50 Hz)
- Cooling Water: 70 liter/min
- Dimensions (LxWxH): ~ 5m x 1.2m x 2m
- FOB Price: USD 18,000 – 25,000 (New)
- Gross Weight: ~ 2 ton

3. Hot Forging Machine







- Nominal Force: ~ 2,000 ton
- Stroke Length: ~ 330 mm
- Stroke Rate: 50 – 70 nos./min
- Die Height: ~ 800 mm
- Slide Adjustment: 10 – 15 mm
- Bolster Area (WxD): 1,450 mm x 1,400 mm
- Bolster Thickness: 300 mm
- Slide Area (WxD): 1,300 mm x 1,200 mm
- Slide Opening (HxD): 1,100 mm x 800 mm
- Motor Power: 540 kW (90 kW x 6 Pieces)
- Slide Knock-out Device: 20/45 ton/mm
- Bed Knock-out Device: 40/70 ton/mm
- Dimension (WxDxH): 5m x 4m x 6.5m
- FOB Price: USD 25,000 – 40,000 (New)
- Gross Weight: ~ 80 ton

4. Mechanical Stamping Press Machine (Power Press)



- Nominal Force: ~ 75 ton
- Stroke Length: ~ 100 mm
- Stroke Rate: 30 – 50 nos./min
- Die Height: ~ 400 mm
- Table Area (WxD): 800 mm x 600 mm
- Crank Shaft Dia.: ~ 150 mm
- Flywheel Dia.: 900 mm
- Bed Bore Dia.: 200 mm
- Motor Power: 10 kW (400V, 3 Phase, 50 Hz)
- Dimension (WxDxH): ~ 2m x 1.5m x 3m
- FOB Price: USD 10,000 – 15,000 (New)
- Gross Weight: ~ 5 ton

5. Broaching Machine	
	<ul style="list-style-type: none"> • Broaching Force: ~ 10 ton • Stroke Length: ~ 1,000 mm • Broaching Speed: 3 – 8 m/min • Return Speed: 2 – 12 m/min • Workpiece Dia.: Max. 500 mm • Table Area (WxD): 500 mm x 700 mm • Table Height: ~ 1,600 mm • Power: ~ 15 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): ~ 1.5m x 2m x 3m • FOB Price: USD 10,000 – 15,000 (New) • Gross Weight: ~ 2 ton
6. Heat Treatment Furnace	
	<ul style="list-style-type: none"> • Heating System: Modulating Gas Burner • Conveyor Type: Stainless Steel Wire Mesh • Conveyor Width: ~ 2 m • Chamber Size (Lx H): ~ 12m x 2m • Operating Temperature: ~ 1,200 °C • Output: ~ 500 kg/hr • Power: ~ 15 kW (400V, 3 Phase, 50 Hz) • Dimension (LxWxH): ~ 15m x 3.5m x 5m • FOB Price: USD 25,000 – 50,000 (New) • Gross Weight: ~ 8 ton
7. Abrasive Belt Grinding Machine	
	<ul style="list-style-type: none"> • Power: ~ 3 kW (400V, 3 Phase, 50 Hz) • No Load Speed: ~ 3,000 rpm • Belt Dimension (LxW): 2,000mm x 75mm • Wheel Dimension (Dia.xH): 200mm x 75mm • Center-Center Distance: 600mm • Dimension (WxDxH): 0.7m x 0.3m x 1.2m • FOB Price: USD 1,000 – 2,500 (New) • Gross Weight: ~ 35 kg
8. Vibratory Polishing/ Deburring Machine	
	<ul style="list-style-type: none"> • Total Volume: ~ 1,000 liter • Deburring Media: Ceramic Chips • Deburring Media Capacity: ~ 700 kg • Bowl Diameter: ~ 1,500 mm • Output: Max. 1 ton/hr • Motor: 5 HP • Dimension (LxWxH): ~ 1.8m x 1.5m x 1.6m • FOB Price: USD 3,000 – 6,000 (New) • Gross Weight: ~ 1 ton

9. Electroplating Line



- Construction: FRP/ Steel
- Tank Size (LxWxD): ~ 3m x 1.5m x 2m
- No. of Tank: 3 – 12 nos.
- Agitation Media: Compressed Dry Air
- Air Consumption: ~ 2 – 5 m³/hr (5 bar)
- Media Pump Capacity: ~ 500 l/min
- Transfer Mechanism: Overhead Conveyor
- Power: ~ 20 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): ~ 20m x 4m x 5m
- FOB Price: USD 30,000 – 50,000 (New)
- Gross Weight: ~ 12 ton

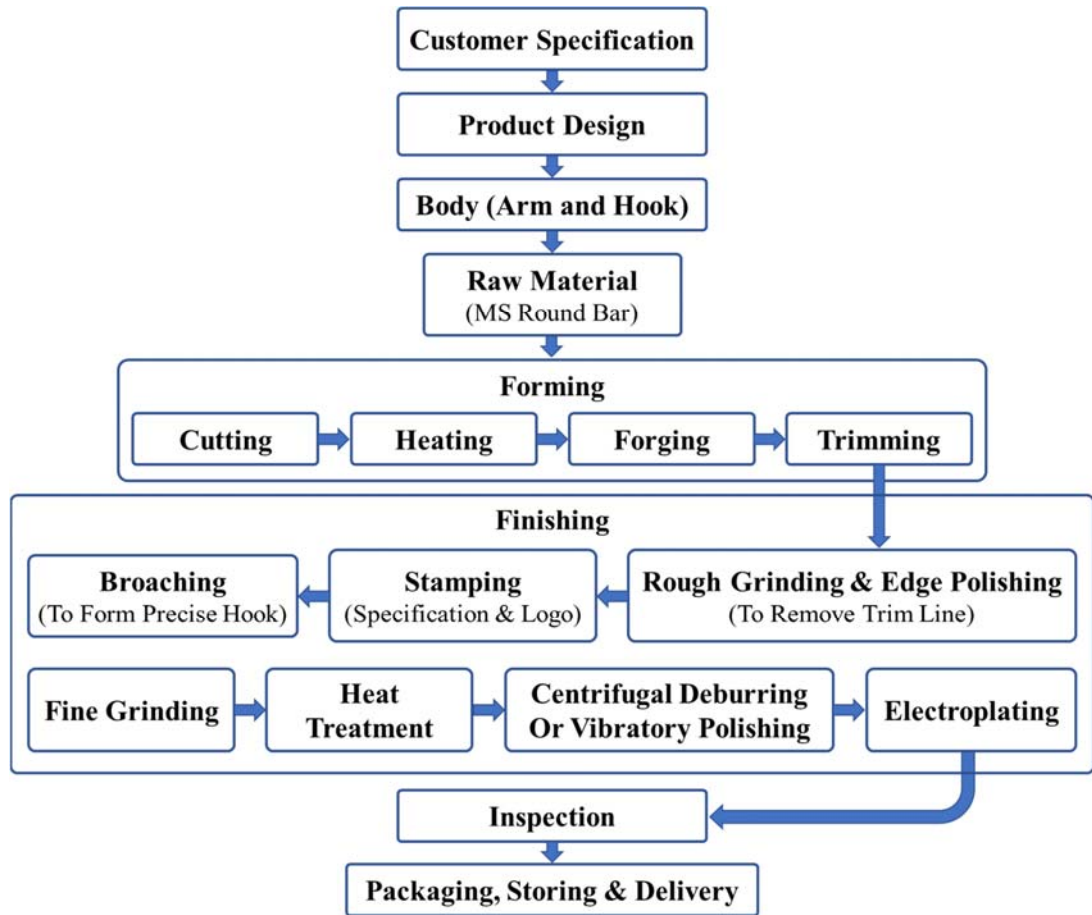
Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandhu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Kawalla, R., Grechnikov, F. V., Nosova, E. A., and Erisov, Y. A., “Advanced Materials and Processes of Metalworking II”, Trans Tech Publications, 2017.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.

Production Process Flow Chart:



Product-23: Mold

Sub-sector: Mold & Die

HS-2007:	8480.71.00	BSIC-2009:	2593	BCPC-2011:	44916
-----------------	------------	-------------------	------	-------------------	-------

Description:
 A Mold or Mould is a hollow container used to give shape to molten or hot liquid material (plastic/metal) when it cools and hardens. It is widely used in plastic injection and blow molding and also in metal (aluminum) die casting.



Component:	1. Base	2. Cavity	3. Core
	4. Sprue, Runner & Gate	5. Overflow & Vent	6. Cooling System, etc.

Raw Materials:


Base Raw Material:	<ul style="list-style-type: none"> Tool Steel Ingot/ Bloom/ Slab (Dimension: Subjected to molded product) 	<ul style="list-style-type: none"> Tool Steel Round Bar (Dia.: 20 – 200 mm)
---------------------------	--	--



Raw Material Supplier:

- Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677.
- Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615.

Machineries, Equipment and Specification:

1. Band Saw Machine

	<ul style="list-style-type: none"> Blade Size (LxW): ~ 12,000 mm x 70 mm Blade Thickness: ~ 1.6 mm Blade Speed: 1 – 5 rpm Cutting Range (@ 90 Degree): <ul style="list-style-type: none"> o Circular: Max. Dia. 800 mm o Rectangular: Max. 1,200 mm x 800 mm Power: ~ 15 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): 6m x 4m x 3.5m FOB Price: USD 30,000 – 50,000 (New) Gross Weight: ~ 12 ton
---	---

2. Shaper Machine	
	<ul style="list-style-type: none"> • Cutting Length: ~ 1,500 mm • Table Travel (Horizontal): 800 mm • Table Travel (Vertical): 400 mm • Tool Head Swivel: ± 60 Degrees • Tool Head Travel: 250 mm • Ram Stroke: 15 – 100 nos./min • Power: 8 kW (400V, 3 Phase, 50 Hz) • Dimensions (LxWxH): ~ 3.5m x 1.2m x 1.5m • FOB Price: USD 10,000 – 15,000 (New) • Gross Weight: ~ 3.5 ton
3. Surface Grinding Machine	
	<ul style="list-style-type: none"> • Table Area (LxW): 1,500 mm x 800 • Work Size (LxWxH): 1,300x 650x 500 mm • Table Speed: 3 – 30 m/min • Table Load Capacity: 1 ton • Grinding Stroke (Traverse): 650 mm • Grinding Wheel Speed: ~ 1,500 rpm • Grinding Wheel Size (Dia.xT): ~ 400x 50 mm • Power: ~ 12 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): 3.5m x 2m x 2.5m • FOB Price: USD 12,000 – 18,000 (New) • Gross Weight: ~ 7 ton
4. CNC Vertical Machining Center	
	<ul style="list-style-type: none"> • Work Envelop (XxYxZ): 1.2m x 0.6m x 0.7m • Table Dimension (LxW): 1,300mm x 600mm • Table Load Capacity: 1 ton • T-Slot (Qty.xWx Spacing): 5 x 18 x 100 mm • Throat: 650 mm • Spindle Speed: 8,000 rpm (BT40) • Work Feed Rate (XxY): 0.001 – 12 m/min • Rapid Feed Rate (XxY): 36 m/min • Work Feed Rate (Z): 0.001 – 12 m/min • Rapid Feed Rate (Z): 30 m/min • Tool Station: 24 pieces • Tool Weight: 8 kg • Positioning Accuracy: ± 0.004 mm • Power: 20 kW (400V, 3 Phase, 50 Hz) • Dimension (WxDxH): ~ 3m x 2.5m x 2.7m • FOB Price: USD 20,000 – 40,000 (New) • Gross Weight: ~ 8 ton

5. CNC Engraving Machine



- Work Area (LxW): 0.6m x 0.6m
- Table Size (LxW): 1,000mm x 800mm
- Table Load Capacity: 0.8 ton
- Spindle Speed: 24,000 rpm
- Work Feed Rate: Max. 10 m/min
- Tool Station: 8 pieces
- Positioning Accuracy: ± 0.004 mm
- Power: 5 kW (400V, 3 Phase, 50 Hz)
- Dimension (WxDxH): $\sim 1.8\text{m} \times 1.5\text{m} \times 2\text{m}$
- FOB Price: USD 8,000 – 15,000 (New)
- Gross Weight: ~ 2 ton

6. CNC Horizontal Lathe Machine



- Swing Over Bed: ~ 450 mm
- Max. Turning Dia.: ~ 300 mm
- Max. Turning Length: ~ 500 mm
- Travel (X, Z): $\sim 200\text{mm}, \sim 500$ mm
- Chuck Size: $\sim 8 - 12$ in.
- Spindle Speed: $\sim 6,000$ rpm
- Spindle Bore: ~ 50 mm
- Tool Change Type: Servo
- Tool Stations: 8 nos.
- Speed of Driven Tools: $\sim 5,000$ rpm
- Power: ~ 15 kW (400V, 3 Phase, 50 Hz)
- Dimensions (LxWxH): $\sim 3\text{m} \times 1.6\text{m} \times 1.8\text{m}$
- FOB Price: USD 20,000 – 40,000 (New)
- Gross Weight: ~ 5 ton

7. Electroplating Line

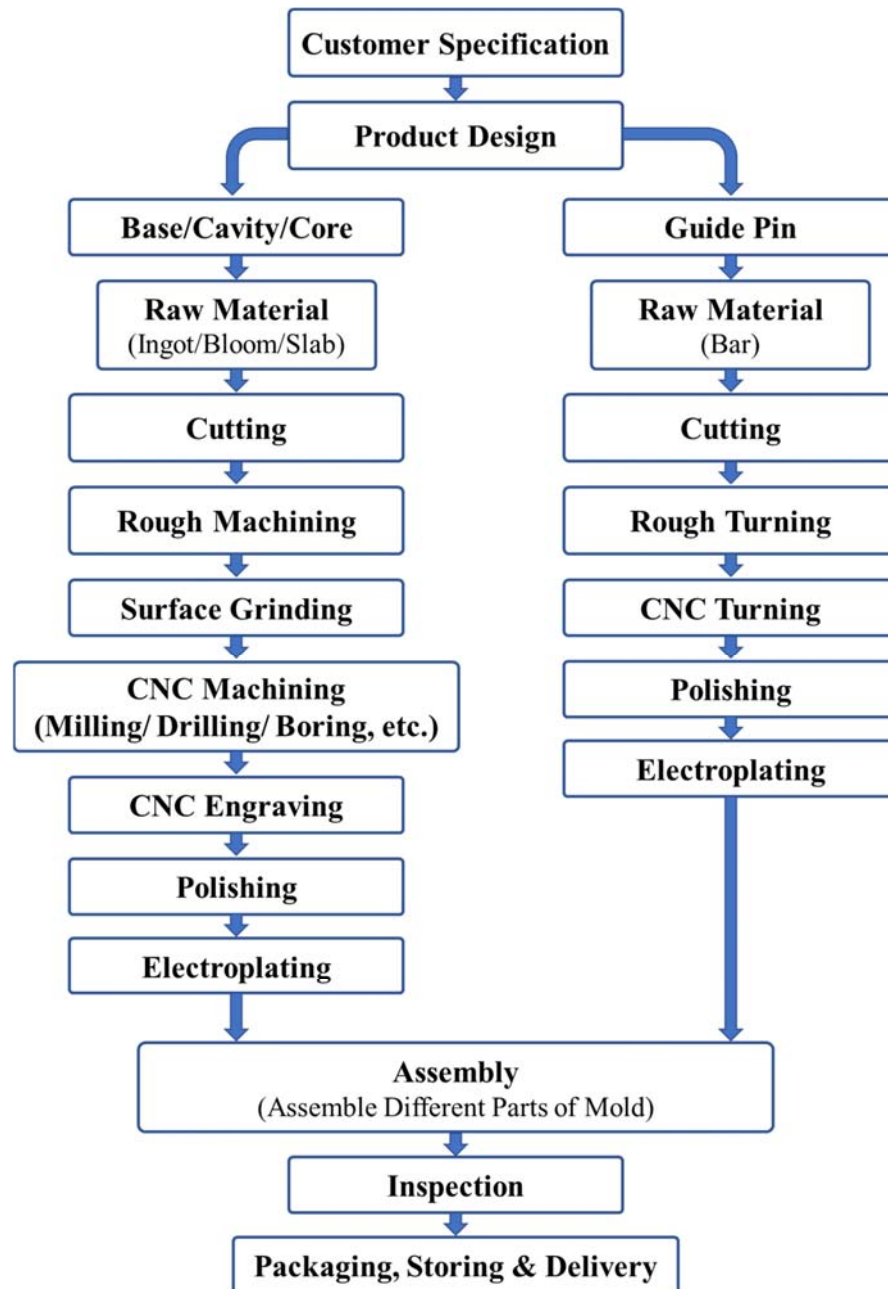


- Construction: FRP/ Steel
- Tank Size (LxWxD): $\sim 3\text{m} \times 1.5\text{m} \times 2\text{m}$
- No. of Tank: 3 – 12 nos.
- Agitation Media: Compressed Dry Air
- Air Consumption: $\sim 2 - 5$ m³/hr (5 bar)
- Media Pump Capacity: ~ 500 l/min
- Transfer Mechanism: Overhead Conveyor
- Power: ~ 20 kW (400V, 3 Phase, 50 Hz)
- Dimension (LxWxH): $\sim 20\text{m} \times 4\text{m} \times 5\text{m}$
- FOB Price: USD 30,000 – 50,000 (New)
- Gross Weight: ~ 12 ton

Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Production Process Flow Chart:

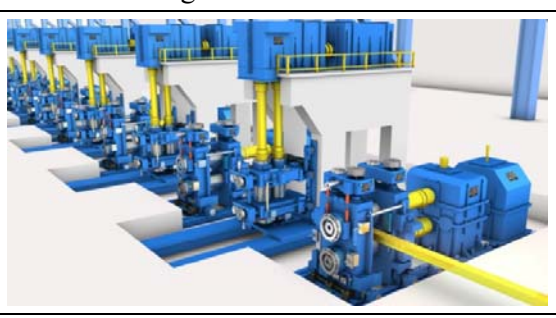


Bibliography:

- Kawalla, R., Grechnikov, F. V., Nosova, E. A., and Erisov, Y. A., “Advanced Materials and Processes of Metalworking II”, Trans Tech Publications, 2017.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.

Product-24: Fish Plate					
Sub-sector:	Railway				
HS-2007:	7302.40.00	BSIC-2009:	2410	BCPC-2011:	41253
Description: A fish plate is a metal or wooden plate that is bolted to the sides at the ends of two rails or beams, to join them.					
Product:					
Component:	1. Body				
Raw Materials:					
Base Raw Material:	<ul style="list-style-type: none"> High Strength Steel Billet (150 mm x 150 mm) 				
Raw Material Supplier:					
<ul style="list-style-type: none"> Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. Bangladesh Iron and Steel Importers' Association. 22/1 Nazira Bazar Lane, Dhaka-1100. Tel: +8802-9559942. Mobile: +8801715-008615. 					
Machineries, Equipment and Specification:					
1. Roller Hearth Furnace					
			<ul style="list-style-type: none"> Heating System: Modulating Gas Burner Conveyor Type: Steel Roller Chamber Size (LxWxH): ~ 20m x 3m x 4m Operating Temperature: Max. 1,200 °C Output: ~ 2 ton/hr Power: ~ 20 kW (400V, 3 Phase, 50 Hz) Dimension (LxWxH): ~ 25m x 3.5m x 5m FOB Price: USD 2,50,000 –4,00,000 (New) Gross Weight: ~ 40 ton 		

2. Hot Rolling Mill



- No. of Rolling Strands: 5 – 15 nos.
- Type of Rolling Strand: 2/4 High Mill
- Rolling Section: Max. 300mm x 300mm
- Rolling Speed: ~ 50 m/min
- Power: 120 kW (400V, 3 Phase, 50 Hz)
- Dimensions (LxWxH): ~ 25m x 5m x 7m
- FOB Price: USD 5,00,000 – 15,00,000 (New)
- Gross Weight: ~ 80 ton

3. Forging Press Machine



- Nominal Force: ~ 1,500 ton
- Stroke Length: ~ 300 mm
- Stroke Rate: 50 – 70 nos./min
- Die Height: ~ 500 mm
- Bolster Area (WxD): 1,500 mm x 1,400 mm
- Bolster Thickness: 400 mm
- Slide Area (WxD): 1,500 mm x 1,300 mm
- Slide Opening (HxD): 1,200 mm x 1,000 mm
- Power: 500 kW (400V, 3 Phase, 50 Hz)
- Slide Knock-out Device: 20/45 ton/mm
- Bed Knock-out Device: 40/70 ton/mm
- Dimension (WxDxH): 5m x 4m x 8m
- FOB Price: USD 40,000 – 80,000 (New)
- Gross Weight: ~ 60 ton

4. Heavy Duty Circular Saw Machine



- Blade: 1,500 mm O.D.; 9 mm Thick; Carbide
- Speed: ~ 3,000 rpm
- Cutting Speed: 8 – 30 m/min
- Work Range: 1,200 mm x 400 mm
- Miter Range: 45 Degree (Left & Right)
- Power: ~ 22 kW (220V, 1 Phase, 50 Hz)
- Dimension (LxWxH): ~ 4.5m x 1.5m x 3m
- FOB Price: USD 8,000 – 12,000 (New)
- Gross Weight: ~ 9 ton

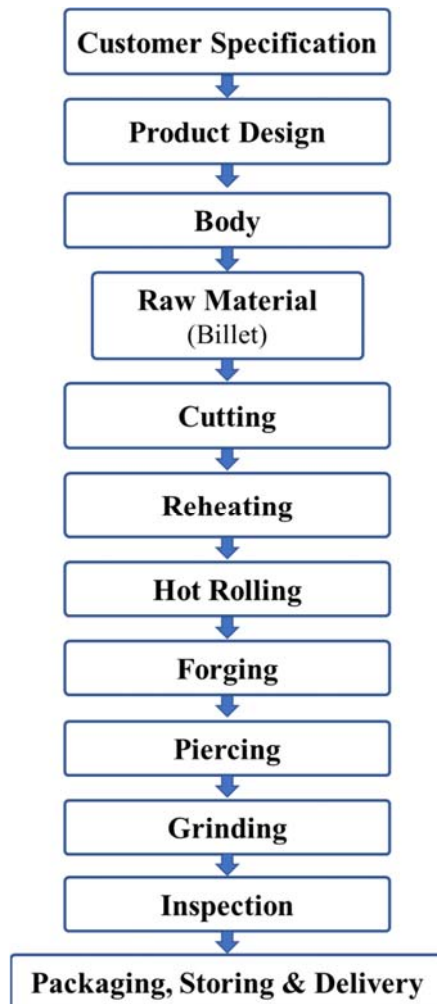
Machineries Supplier:



- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Kawalla, R., Grechnikov, F. V., Nosova, E. A., and Erisov, Y. A., “Advanced Materials and Processes of Metalworking II”, Trans Tech Publications, 2017.
- Hingole, R. S., “Advances in Metal Forming”, Springer-Verlag Berlin Heidelberg, 2015.
- Mielnik, Edward M., “Metalworking Science and Engineering”, McGraw-Hill, 1991.

Production Process Flow Chart:



Product-25: Brake Block					
Sub-sector:	Railway				
HS-2007:	8607.19.00	BSIC-2009:	2599	BCPC-2011:	49540
Description: A Brake Block is a component of the braking system, applied to the tread of the wheel rim to effect braking on vehicles equipped with the tread brake system.					
Product:					
Component:	1. Body				
Raw Materials:					
Base Raw Material:	• Pig Iron and Steel Scrap		• Coke (Petroleum/ Metallurgical)		
	• Limestone		• Ferro-alloys (FeSi, FeMn, SiMn)		
Accessories:	• Bolt and Nut	• Valve and Seal	• Inoculant & Nodulant		
	• Sand & Binder	• Sand Additives			
Raw Material Supplier:					
<ul style="list-style-type: none"> • Bangladesh Iron & Steel Merchants' Association. 12/1 Tajmahal Road, Mohammadpur Dhaka-1207. Tel: +8802-9120999, +8802-9127986. Mobile: +8801720-481677. • Bangladesh Chemical Importers and Merchants Association. 124, Hazaribagh, Dhaka-1209. Mobile: +8801986-842486, +8801819-145007. • Bangladesh Sand Mining & Merchants Association. Chakdah Building, Munshikhola, Chakdah, Shaympur, Dhaka. Tel: +8802-7445755. Mobile: +8801711-532960. 					
Machineries, Equipment and Specification:					
1. Vibratory Sand Sieve/ Sifter Machine					
			<ul style="list-style-type: none"> • Effective Dia.: ~ 1,500 mm • Screen: 1 – 5 nos.; Mesh: 0.025 – 20 mm • Speed: ~ 1,500 rpm • Power: ~ 2.5 kW (220V, 3 Phase, 50 Hz) • Noise Level: ~ 50 – 65 dB • Dimension (LxWxH): ~1.8m x 1.8m x 1.8m • FOB Price: USD 4,000 – 5,000 (New) • Gross Weight: ~ 0.5 ton 		

2. Sand Mixer/ Muller Machine



- Batch Capacity: ~ 500 kg
- Output (180 sec cycle): ~ 10 ton/hr
- Pan Size (Dia. xH): ~ 1.8 m x 0.8 m
- Roller Size (Dia. xW): ~0.6m x0.3m, 2 no.
- Door Size (HxW): ~ 0.5m x0.3m
- Drive Motor: ~ 20 HP
- Power: ~ 15 kW (380V, 3 Phase, 50 Hz)
- Dimension (LxWx H): ~2m x 1.8m x 3m
- FOB Price: USD 3,500 – 6,000 (New)
- Gross Weight: ~ 3 ton

3. Cupola Furnace



- Construction: MS Plate. 10 mm thick.
- Lining: 130 mm/ Layer, 3 Layers
- Cupola Inner Dia.: ~ 1 m
- Tuyere Area (1:5): ~0.5m, 8 nos./row, 2 row
- Charging Door Size (LxH): ~ 0.6 m x 0.5 m
- Blast Motor Power: ~ 25 HP
- Blast Volume (1:5): ~ 130 cu.m/min
- Melting Rate: ~ 5 ton/ hr
- Dimension (LxWxH): ~ 12m x 3.5m x 3.5m
- FOB Price: USD 25,000 – 40,000 (New)
- Gross Weight: ~ 30 ton

4. Molding Hand Tool Kit



- Type: Hand Tools
- Tools: Rammer, Vent Wire, Trowel, Slick & Spoon, Lifter, Sprue Pin, Swab, Draw Spike, Bellow, Riddle, etc.
- FOB Price: USD 200 – 800 (New)
- Gross Weight: ~ 15 kg

5. Pattern Making Tool Kit



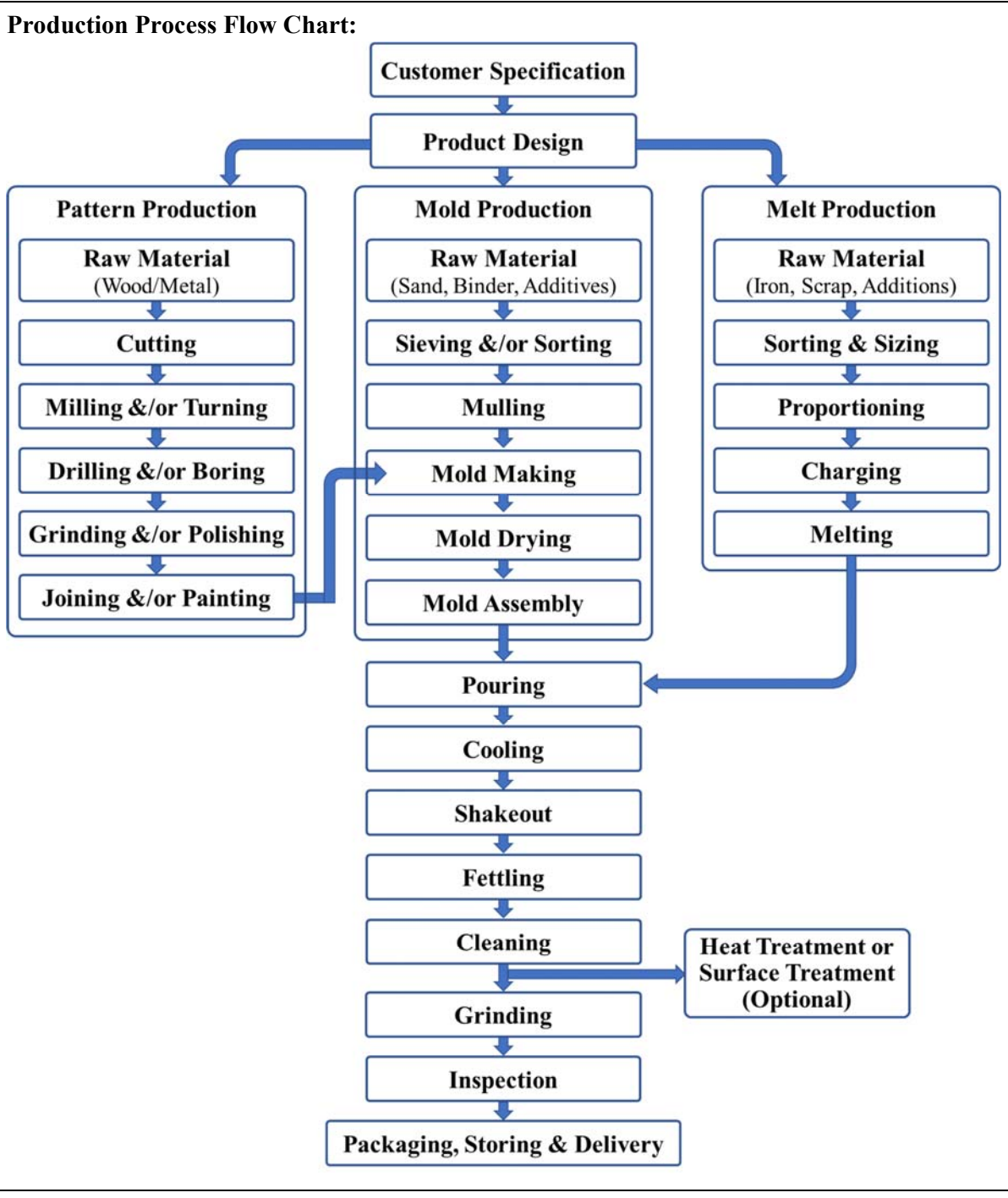
- Type: Woodworking Hand Tools
- Tools: Measuring Tools, Marking Tools, Cutting Tools, Surfacing Tools, Curving Tools, Finishing Tools, etc.
- FOB Price: USD 100 – 600 (New)
- Gross Weight: ~ 20 kg

Machineries Supplier:

- Bangladesh Hardware & Machinery Merchants' Association (BHMMA), 5, Bangabandu Avenue (3rd Floor), Dhaka. Tel: +8802-9569783. Mobile: +8801924-424085.
- China Bangla Engineers & Consultants Ltd. Mobile: +8801914-867929, +8801716-752370.
- United Trading Company. Mobile: +8801689-995162, +8801715-295798.
- Machine & Tools International. Mobile: +8801743-270839, +8801759-401381.

Bibliography:

- Campbell, John, "Complete Casting Handbook: Metal Casting Processes, Techniques and Design", 1st Ed., Butterworth-Heinemann, 2011.
- John, K. C., "Metal Casting & Joining", Prentice-Hall (India) Pvt. Ltd., 2015.
- Beeley, Peter, "Foundry Technology", 2nd Ed., Butterworth-Heinemann, 2001.
- Tuttle, Robert B., "Foundry Engineering: The Metallurgy and Design of Castings", Vol. 1, CreateSpace Independent Publishing Platform, 2012.



Annex-1: List of Products under Mandatory Certification Marks Scheme

A. Food and Agricultural Products (64 items):

Sl.	Name of the products	Standard No.
1.	Fruit Juice & Nectars	BDS CAC 247:2008
2.	Ice Cream	BDS 1083 :2006
3.	Concentrated Fruit Juice	BDS 527:2007
4.	Chilies, Whole and Ground	BDS 1017:2001
5.	Fruit Squash	BDS 506:2002
6.	Soya bean Oil	BDS 909:2000
7.	Jam, (Fruit Preserves) & Jelly's	BDS CAC 79:2008
8.	Mustard Oil	BDS 25:2000, Amend: 3, 2007
9.	Citrus Marmalade	BDS CAC 80: 2008
10.	Turmeric Powder	BDS 991: 2001
11.	Vinegar	BDS CAC 162:2007
12.	Edible Palm Oil	BDS 999:2000
13.	Fruit Syrup	BDS 528:2006
14.	Sugar	BDS CAC 212:2006
15.	Honey	BDS CAC 12:2007
16.	Suji (Semolina)	BDS 190:1991, Amend 1: 2001
17.	Canned & Bottled Fruit	BDS 503:2006
18.	Pasteurized Milk	BDS 1702:2002
19.	Fruit Cordial	BDS 508:2006
20.	Chips/Crackers	BDS 1556:1997, Amend 1: 2004
21.	Sauce (Fruits or Vegetable)	BDS 512:2007
22.	Chanachur	BDS 1564:1997, Amend 1: 2004
23.	Tomato Paste	BDS 517:2002
24.	Lachha Semai	BDS 1620:2000
25.	Pickles	BDS 520:2001
26.	Soft Drink Powder	BDS 1586:2007
27.	Canned Pineapple	BDS CAC 42:2007
28.	Banaspati	BDS 804:2001
29.	Tomato Ketchup	BDS 530:2002
30.	Instant Noodles	BDS 1552:2007
31.	Infant Formula & Formulas for Special Medical purposes intended for infants	BDS CAC-72-2008
32.	Processed cereal based food for infants & Young Children	BDS CAC 74:2007
33.	Milk Fat Products	BDS CAC A:2:2008
34.	Edible Sun Flower Oil	BDS CAC 23: 2002
35.	Butter	BDS CAC-A-1:2002
36.	Mosquito Coil	BDS 1089: 2007
37.	Milk Powder and Cream Powders	BDS CAC 207:2008
38.	Malathion 57% (W/V) (Emulsifiable Concentrates)	BDS 1179: 2001
39.	White Bread	BDS 382:2001
40.	Plywood for General Purposes	BDS 799: 2006
41.	Biscuit	BDS 383:2001
42.	Plywood Tea-Chest	BDS 18:2006
43.	Lozenges	BDS 490:2001, Amend 1: 2007
44.	Safety matches in boxes	BDS 1040:2006
45.	Toffees	BDS 1000:2001
46.	Wheat Bran	BDS 997:2006
47.	Black Tea Definition & Basic requirements	BDS ISO:3720:2008

48.	Condensed Milk and Condensed Skim Milk	BDS CAC A-4:2002
49.	Liquid Glucose (Glucose Syrup)	BDS CAC 9:2006
50.	Refined Palm Olein	BDS 1567:2007
51.	Dextrose Monohydrate	BDS CAC 8:2007
52.	Yoghurt and Sweetened Yoghurt	CAC-A-11(a):2002
53.	Maida	BDS 381:2007
54.	Curry Powder	BDS 1205: 2006
55.	Wheat Atta	BDS 380:1980, Amend 1: 2001
56.	Fortified Soybean Oil	BDS 1769:2006, Amend 1: 2008
57.	Carbonated Beverages	BDS 1123:2002, Amend 1: 2007
58.	Fortified Edible Palm Oil	BDS 1770:2006, Amend 1:2008
59.	Noodles	BDS 1106:2001
60.	Refined Sugar	138: 2006
61.	Iodized Salt	BDS 1236:2001, Amend 1: 2007
62.	Cake	BDS 1574: 2006
63.	Drinking Water	BDS 1240:2001
64.	Natural Mineral Water	BDS 1414:2000

B. Chemical Products (40 items):

Sl.	Name of the products	Standards No.
65.	Coconut Oil	BDS 99:2007
66.	Carbolic Soap	BDS 181:02Amend1:02
67.	Stencil Paper	BDS 1030:98 Amend 1: 06
68..	Ink, Duplicating	BDS 146:2002
69.	Writing and Printing Papers	BDS 405:96 Amen1:06
70.	Ferro-gallo tannate Fountain Pen Ink	BDS 88:91Amend 1:06
71.	Pencils	BDS 330:93 Amen 1:06
72.	Ceramic Tableware	BDS 485:2000 Amend 1,2,3 :06
73.	Ready Mixed Paint, brushing, finishing semi-gloss for general purpose.	BDS 402:1989 Amend 1 ,2: 2007,
74.	Tableware Made of Melamine Plastics	BDS 1425 :2009
75.	Shoe Polish, Paste	BDS 1006:1981 Amend 1: 06
76.	Skin Cream	BDS 1382:1992Amend 1,2,3: 06
77.	Coal Tar Black Paint (Alquatra)	BDS 69 Part-2):91 Amend 1: 06
78.	Shaving Cream	BDS 1241:1989 Amend 1,2: 06
79.	Toilet Soap	BDS 13:06 Amend 1:08
80.	After Shave Lotion	BDS 1524:2006
81.	Laundry Soap Powder	BDS 329: 2006
82.	Lipstick	BDS 1424:1993 Amend 1,2: 06
83.	Laundry Soap	BDS 12:2006
84.	Hair Oils	BDS 1339:91Amend:1 :06
85.	Ink Stamp Pad	BDS 90:2002
86.	Shampoo, Synthetic Deter-gent based	BDS 1269:02 Amend 1: 03
87.	News Print	BDS 845:94 Amend 1:06
88.	Ammonium Sulfate (Fertilizer)	BDS 36:93 Amend 1:08
89.	Urea (Fertilizer)	BDS 217:1993
90.	Ball Point Pens	BDS 1384:2002
91.	Aluminium Sulphate, Non-Ferric	BDS 149:1990
92.	High Speed Diesel	BDS 344:1991 Amendment 1:2000,2:03
93.	Triple Super Phosphate (T.S.P.)	BDS 216:1991 Amend 1 ,2: 07,
94.	Unleaded Motor Gasoline-Premium	BDS 346:99Amend1:03
95.	Ribbons, Type writer	BDS 236: 2006
96.	Unleaded Motor Gasoline-Regular	BDS 347:1999 Amend 1: 06

97.	Water Resistant Vegetable Tanned Sole Leather	BDS 340:1991
98.	Tooth Powder	BDS 1370:1992 Amend 1 : 06
99.	Carbon Paper for type writer	BDS 411:89Amend1:06
100.	Skin Powder	BDS 1337:1991Amend 1 :06
101.	Tooth Paste	BDS 1216:2001 Amend 1,2,3 : 06
102.	Cement Paints	BDS 1706:2002
103.	Synthetic Detergent Powder	BDS 1445:2003
104.	Tableware urea molding compound	BDS 1825:2011

C. Jute and Textile Products (11 items):

Sl.	Name of the products	Standards No.
105.	Rubber conveyor and elevator belting of ply construction.	BDS 1200(Part 1:2005
106.	Polyester Cotton Shirting	BDS 1148:2003
107.	Cotton Sewing Thread	BDS 33:1989
108.	Polyester blend Suiting	BDS 1175:2002
109.	Industrial Sewing Thread made wholly or partly from synthetic fibre	BDS 1221:2001
110.	Rubber Flat Transmission Belting of Textile	BDS 1199:2006
111.	Umbrella cloth	BDS 1125:2005
112.	Poplin Fabric	BDS 32:2001
113.	Textiles Color Fastness Ratings Specification	BDS 1758:2006
114.	Cotton Canvas	BDS 319:2005
115.	Fastness of Dyes on Textile to Steaming	BDS ISO 105-E 11:2004

D. Electronics and Electrical Products (25 items):

Sl.	Name of the products	Standards No.
116.	Two-Pin Plugs & Socket-Outlets	BDS 102:1990 Reaffirmed 2005
117.	Three-Pin Plugs & Socket-Outlets	BDS 115:1989 Reaffirmed 2005
118.	Aluminium Conductors Steel Re-inforced for Overhead Power Transmission	BDS 1037: 2003
119.	Bare Aluminium and Aluminium alloy Conductors for overhead power transmission	BDS 1036:2006
120.	Winding Wires: a) Part 1 Enameled round copper winding wires b) Part-2 Enameled rectangular copper winding wires c) Part 3 Enameled round Aluminium winding wires d) Part-4 Enameled rectangular Aluminium winding wires e) Part-5 Test Method	BDS 1034 (Part-1):2006 BDS 1034 (Part-2):2006 BDS 1034 (Part-3):2006 BDS 1034 (Part-4):2006 BDS 1034 (Part-5):2006
121.	(a) Insulated Flexible Cords (Part-1) General requirements (b) Insulated Flexible Cords (Part-2) Requirements for rubber insulated flexible cords (c) Insulated Flexible Cords (Part-3) Requirements for PVC Insulated Flexible cords (d) Insulated Flexible Cords (Part-4) Flexible cords Insulated with varnished glass fiber. (e) Insulated Flexible Cords (Part-5) Methods of test. (f) Insulated Flexible Cords (Part-6) Methods of test.	BDS 899 (part-1) :2000 BDS 899 (part-2) :2001 BDS 899 (part-3) :2001 BDS 899 (part-4) :2001 BDS 899 (part-5) :2001 BDS 899 (part-6):2001
122.	Three phase Induction Motors	BDS 1139:1986Amendment 1:2006
123.	Power Cables with extruded insulation and their accessories for rated voltage from 1kv up to 30kv 1. Part 1 Cables for rated voltage of 1 kv and 3 kv 2. Part-2 Cables for rated voltage from 6kv up to 30 kv	

	3. Part-4 Test requirement of accessories for 6kv up to 30 kv	BDS IEC 60502-1:2005 BDS IEC 60502-2:2005 BDS IEC 60502-4:2005
124.	(a) Lead acid starter batteries (Part-1) General requirements and methods of test. (b) Lead acid starter batteries (Part-2) Dimensions of batteries and dimension and marking of terminals. (c) Lead acid starter batteries (Part-3) Dimension of batteries for heavy commercial vehicles.	BDS 206 (Part-1) :2002 BDS 206 (Part-2) :2002 BDS 206 (Part-3) :2002
125.	Porcelain Insulator for overhead power lines with a nominal voltage Up to and including 1000 V	BDS 1543:2006
126.	Electricity Metering Equipment (AC) –Particular Requirements (Part-11), Electromechanical Meters for Active Energy (Class 0.5.1 and 2)	BDS IEC 62053-11 :2004
127.	Switches for household and similar fixed electrical installation Part-1 General requirement	BDS IEC60669-1:07
128.	Self-Ballasted Lamps for General Lighting Services- Performance Requirements	BDS 1734:2003
129.	Electronic Ballasts for Tubular Fluorescent Lamps- Performance Requirements	BDS IEC 60929:05
130.	Cut-Out Switches (Main Switches)	BDS 1395:1993 Reaffirmed 2005
131.	Ceiling Roses	BDS 116:2006
132.	Electronic Type Fan Regulators	BDS 1323:1991 Amendment 1:2006
133.	Ballast for Tubular Fluorescent Lamps performance requirements	BDS IEC 60921:2005
134.	Electric Irons for household or similar use methods for measuring performance	BDS IEC 60311:05
135.	PVC Insulated Cables (non armoured for electric power and lighting)	BDS 900: 2000
136.	Tungsten Filament Lamps for domestic and similar general lighting purposes performance requirements	BDS 17:2006
137.	Electric circulating Fans & Regulators (ceiling and deck head fans, pedestal fans & table/cabin fans within built regulators)	BDS 818:1998 Amendment 1: 2006
138.	Primary Batteries: 1. Part-1 General 2. Part-2 Physical and Electrical Specification 3. Part-3 Watch Battery 4. Part 4 Safety and lithium Batteries 5. Part-5 Safety of Batteries with Aquas Electrolyte	BDS IEC 60086-1:2005 BDS IEC 60086-2:2005 BDS IEC 60086-3:2005 BDS IEC 60086-4:2005 BDS IEC 60086-5:2005
139.	Insulators for overhead lines with a nominal voltage over 1000 V 1. Part-1 Ceramic or glass Insulator units for ac systems- definitions, test methods and acceptance criteria 2. Part-2 Insulator strings and insulator sets for ac systems- definition, test methods and acceptance criteria	BDS IEC 600383-1:2006 BDS IEC 600383-2:2006
140.	Double caped Fluorescent Lamps performance requirements	BDS IEC 60081:06

E. Engineering Products (15 items):

Sl.	Name of the products	Standards No.
141.	Mild Steel Pipe and G.I. Pipe	BDS 1031:2006
142.	Protective Helmets for Scooter & Motor Cycle Riders	BDS 1136:1986 Reaffirmed 07
143.	Safety Razor Blades	BDS 219:2002
144.	Sanitary ware appliances	BDS 1162:2006
145.	Pipes and fittings made of un-plasticized polyvinyl chloride (PVC-U) for water supply - Part 1: General - Part 2: Pipes (with or without) integral sockets - Part 3: Fittings and Joints	BDS ISO 4422-1 :2008 BDS ISO 4422-2 :2008 BDS ISO 4422-3:2008
146.	Steel for the Re-enforcement of Concrete (Part-1 & Part-2)	BDS ISO 6935-1:2006 BDS ISO 6935-2:2006

147.	G P Sheet (with Corrugation)	BDS 1122:1987 Reaffirmed 2007
148.	Portable Fire Extinguisher	BDS 825:1991 Reaffirmed 2007
149.	Gas Mantles	BDS 1197:1988 Reaffirmed 2007
150.	Bi-cycle Rim	BDS 986:2006
151.	Bitumen and Bituminous Binders Paving Grade Bitumen Bitumen and Bituminous Binders Cationic Bituminous Emulsions	BDS EN 12591:2009 BDS EN 13808:2009
152.	Cement part I Composition, Specifications and Conformity criteria for common Cement	BDS EN 197-1:2003
153.	Common Building Clay Bricks	BDS 208:1980
154.	Ceramic Tiles	BDS ISO 13006:2006
155.	Aluminium and Aluminium alloys-Extruded rod/bar tube and profiles-Profiles, tolerances on dimensions and form.	BDS 1825: 2011

Annex-2: Glossary of Engineering Terminology

Abrasion: The displacement and/or detachment of metallic particles from a surface because of being exposed to flowing solids, fluids or gases.

Abrasion Resistance: The ability to withstand the effects of repeated wearing, rubbing, scraping, etc., that tend to remove material from its surface.

Age Hardening: Hardening by aging, usually after rapid cooling or cold working.

Aging: A change in properties of metals and alloys which occurs slowly at room temperature and will proceed rapidly at higher temperatures. The change in properties is often, but not always, due to a phase change (precipitation), but never involves a change in chemical composition of the metal or alloy.

Allowance (Tolerance): In a foundry, the clearance specified; difference in limiting sizes, as minimum clearance or maximum interference between mating parts, as computed arithmetically.

Alloy: A substance having metallic properties and composed of two or more chemical elements of which at least one is metal. Usually possesses qualities different from those of the components.

Alloy Steel: Steel containing significant quantities of alloying elements other than carbon to change the physical and/or mechanical properties and the commonly accepted amounts of manganese, silicon, sulfur, and phosphorus.

Annealing: A process of holding a material at a temperature mean, but below its melting point, the objective being to permit stress relaxation without distortion of shape. It is often used on molded articles to relieve stresses set up by flow into the molds.

Bake: Heat in an oven to a low controlled temperature to remove gases or to harden a binder.

Bill of materials (BOM): The list of parts or items that make up a product assembly.

Blasting (Blast Cleaning): A process for cleaning or finishing metal objects by use of an air blast or centrifugal wheel that throws abrasive particles against the surface of the work pieces. Small, irregular particles of steel or iron are used as the abrasive in grit blasting, and steel or iron balls in shot blasting.

Blister: A raised area on the surface of a molding caused by the pressure of gases inside it on its incompletely hardened surface.

Bloom: An intermediate-stage pieces of metal produced by a first pass of rolling having cross-sectional area greater than 36 sq. in (230 sq. cm).

Blow Holes: 1) Holes in the head plate or blow plate of a core-blowing machine through which sand is blown from the reservoir into the core box. 2) Irregular shaped cavities with smooth walls produced in a casting when gas is entrapped during mold filling. The gas sources may be air, binder decomposition products or gases dissolved in the molten steel.

Boring: A machining method using single point tools on internal surfaces of revolution.

British Thermal Unit (BTU): The quantity of heat required to raise the temperature of one pound of water 1°F from 58.5 to 59.5°F (its point of maximum density).

Broach: (v) To finish the inside of a hole to a shape other than round, as in a keyway. (n) The tool for the process, which has serrated edges and is pushed or pulled through the hole to produce the required shape.

Bulk Density: The mass per unit volume of a molding powder as determined in a reasonably large volume. The recommended test method is ASTM D1182-54.

Calendering: A form of extrusion using two or more counter rotating rolls in which film and sheet is produced by squeezing a hot, viscous material between them.

Carbonitriding (Nicking): A process in which a ferrous alloy is case hardened by first being heated in a gaseous atmosphere of such composition that the alloy absorbs carbon and nitrogen simultaneously, and then being cooled at a rate that will produce desired properties.

Carburizing: A form of case hardening that produces a carbon gradient inward from the surface, enabling the surface layer to be hardened by either quenching directly from the carbonizing temperature or by cooling to room temperature, then re-austenitizing and quenching.

Casting: A process in which molten or liquid metal is poured into a mold made of sand, metal or ceramic, to form geometrically complex parts.

Cavity: Depression in a mold made by casting, machining, hobbing, or a combination of these methods; depending on number of such depressions, molds are designated as Single-Cavity or Multi-Cavity.

Celsius: Also referred to as Centigrade, is equal to the difference between the temperature in Fahrenheit less 32 and the quantity divisible by 1.8°C = (°F – 32) ÷ 1.8.

Centrifugal Casting: Casting made in molds which are rotating so as to produce a centrifugal force in the molten metal.

Chucks: Universal holding device capable of OD and /or ID clamping. A chuck may be actuated manually, pneumatically, hydraulically or electrically.

Coining: 1) A process of straightening and sizing casting by die pressing, 2) a process for shaping metal.

Cold Shut: Casting defect caused by imperfect fusing or discontinuity of molten metal coming together from opposite directions in a mold, or due to folding of the surface. It may have the appearance of a crack or seam with smooth, rounded edges.

Compressive Strength: The ability of a material to resist a force that tends to crush it.

Computer-Aided Design (CAD): Use of a computer and specialized graphics software to design a part or workpiece. A machine program may also be obtained as an output of the software.

Computer-Aided Engineering (CAE): the application of computers, special software, and various peripherals to accomplish such engineering tasks as analysis and modeling.

Computer-Aided Manufacturing (CAM): the use of a computer and specialized graphics software to prepare a machine program for a computer numerically controlled (CNC) machine.

Computer-Integrated Manufacturing (CIM): the total integration of such individual concepts as NC, robotics, and materials handling into one large automated system.

Computer Numerical Controls (CNC): a numerical control system where the data handling sequence, the control functions and the response to data input are determined primarily by a

computer program executed by a computer. It provides electrical signals to coordinate and move the various slides or axes of the machine.

Conveyors: a machine used to move parts and materials along an assembly line at a constant rate of speed.

Cope: Upper or topmost section of a flask, mold or pattern.

Core: A performed sand aggregate inserted in a mold to shape the interior or that part of a casting which cannot be shaped by the pattern.

Core Shift: A variation from specified dimensions of a cored section due to a change in position of the core or misalignment of cores in assembling.

Core Vents: 1) holes made in the core for escape of gas. 2) A metal screen or slotted piece used to form the vent passage in the core box employed in a core-blowing machine. 3) A wax product, round or oval in form, used to form the vent passage in a core.

Corrosion: Chemical action which causes destruction of the surface of a material by oxidation or chemical combination.

Corrosion Resistance: The ability to withstand the effect of oxidation.

Crater: A small, shallow surface imperfection.

Creep: The dimensional change with time of a material under load. At room temperature it is also called cold flow.

Crystallinity: A molecular structure resulting from the formation of solid crystals with a geometric pattern.

Cure: The process of changing properties of polymer into a more stable and usable condition. This is accomplished by the use of heat, radiation, or reaction with chemical additives.

Cure Cycle: The time periods at defined conditions to which a reacting thermosetting material is processed to reach a desired property level.

Curing Temperature: Temperature at which a cast, molded, or extruded product, a resin-impregnated reinforcing material, an adhesive, etc., is subjected to curing.

Curing Time: The period of time that a reacting thermosetting material is exposed to specific conditions to reach a specified property level.

Daylight Opening: Clearance between two platens of a press in the open position.

Deburring: The process of eliminating burr from parts, by using methods such as tumbling, sanding, grinding, etc. Deburring acts as a type of finishing as it smoothes edges and helps in machining parts.

Dies: hardened cutting tools used to produce external threads on round work. The most common types are solid, adjustable, and adjustable screw-plate dies.

Dip Coating: Applying a plastic coating by dipping the article to be coated into a tank of melted resin or plastisol, then chilling the adhering melt.

Discoloration: Any change from the original color, often caused by overheating, light exposure, irradiation, or chemical attack.

Draft: The degree of taper of a side wall or the angle of clearance designed to facilitate removal of parts from a mold.

Drag: Lower or bottom section of a mold or pattern.

Drawing: The process of stretching a metal sheet or rod to reduce its cross-sectional area.

Drilling: A cutting process that uses a drill bit to cut a hole of circular cross-section in solid materials.

Ductility: The extent to which a solid material can be drawn into a thinner cross section.

Electrical Discharge Machining (EDM): a metal removal process that uses an electric spark for the removal of metal. The most commonly used EDM machines are the plunge, ram, and the wire-cut.

Electroplating: The deposition of a layer of metal on a base of metal or conducting surface by electrolysis.

Embossing: Techniques used to create depressions of a specific pattern in any materials form.

Extrusion: a process used to force metal, plastic, or other materials, by compression, through a die.

Fahrenheit: Equals 1.8 multiplied to the sum of the temperature in Celsius and $^{\circ}\text{F} = 1.8 \times (^{\circ}\text{C} + 32)$.

Fatigue: The loss of load-bearing ability of a material under repeated load application, as opposed to a single load.

Fin: The web of material remaining in holes or openings in a molded part which must be removed in finishing.

Flash: A thin section of metal formed at the mold, core, or die joint or parting in a casting due to the cope and drag not matching completely, or where core and core-print do not match.

Flask: A metal frame used for making or holding a sand mold. The upper part is the cope and the bottom half is the drag.

Flow Line: A mark on a molded piece made by the meeting of two flow fronts during molding. Also called weld line.

Fluidity: The ability of molten metal to flow.

Gate: The end of a runner in a mold where molten metal enters the mold cavity.

Gating System: The complete assembly of sprues, runners and gates in a mold through which steel flows before entering the casting cavity.

Gear Cutting (Hobbing): A specially designed milling operation used to form gear teeth on a cylindrically shaped gear blank.

Green Sand: A naturally bonded sand, or a compounded molding sand mixture which has been tempered with water for use while still in the damp or wet condition.

Grinding: removes material from the workpiece by a powered abrasive wheel, stone, belt, paste, sheet, compound, slurry, or other agent.

Guide Pins: Devices that maintain proper alignment of force plug and cavity as mold closes.

Hardenability: In a ferrous alloy, the property that determines the depth and distribution of hardness induced by quenching.

Hardness: Resistance of a material to indentation.

Heat Treatment: A combination of heating and cooling operations applied to a metal or alloy to produce desired properties and microstructures.

Hydro-forming: The use of liquid pressure to mold material. In metal forming, the fluid pressure is used to actuate the ram for both open- and closed-die forging.

Impact Strength: The resistance to impact loads; usually expressed as the foot pounds of energy absorbed in breaking a standard specimen.

Impurity: An element unintentionally allowed in a metal or alloy. Some impurities have little effect on properties; others will grossly damage the alloy.

Infra-red: Part of the electromagnetic spectrum between the visible light range and the radar range. Radiant heat is in this range, and infra-red heaters are used in sheet thermoforming.

Ingot: A mass of metal cast to a convenient size and shape for remelting or hot working.

Insulation: Material having a high resistance to the flow of electric current, to prevent leakage of current from a conductor.

Investment Casting: Casting produced in a mold obtained by investing an expendable pattern with a refractory to produce a shell. The expendable pattern may consist of wax, plastic, or other material and is removed prior to filling the mold with liquid metal.

ISO: International Organization of Standardization.

Kelvin: The absolute temperature scale (metric). $K = ^\circ C + 273$.

L/D Ratio: A term used to define an extrusion screw which denotes the ratio of the screw length to the screw diameter.

Ladle: Metal receptacle frequently lined with refractories used for transporting and pouring molten metal. Types include hand bull, crane, bottom-pour, holding, teapot, shank, lip-pour.

Laser: Light Amplification by Stimulated Emission of Radiation. A tool which amplifies and intensifies light into a narrow beam that can be used to cut, melt, and vaporize materials.

Lathe: a machine designed to remove material and produce external or internal forms by rotating a round workpiece against a stationary cutting tool.

Machinability: The extent to which a metal can be machined successfully.

Machining Center: a machine tool that is CNC-controlled to perform a wide variety of machining operations (typically combining boring-drilling-milling tasks) automatically under the control of the part program. Machining centers have three or more axes of motion, have a contouring type numerical control and an automatic tool changer.

Metallurgy: The science and technology of metals, a broad field that includes, but is not limited to, the study of internal structures and properties of metals and the effects on them of various processing methods.

Microstructure: The structure of polished and etched metal and alloy specimens, as revealed by the microscope at magnifications over 10 diameters.

Milling: an operation designed to remove material using a rotating cutter which is also moved laterally with respect to the workpiece.

Mold Shift: A casting discontinuity resulting from misalignment of the cope and drag halves.

Moldability: The characteristics of being easy to mold without rupturing or developing flaws due to movement.

Necking: Reducing the cross-sectional area of the metal in an area by stretching.

Nitriding: A surface hardening process involving heating in an atmosphere of ammonia, or in contact with a nitrogen-bearing material, to promote the absorption of nitrogen.

Nitrogen Flush: Bubbling nitrogen gas through a metal melt under vacuum (as with valve bronze), to improve tensile properties and pressure tightness.

Nobake Binder: A synthetic liquid resin sand binder that hardens completely at room temperature, generally not requiring baking, used in Cold-Setting process.

Nodular Iron: Iron of a normally gray cast iron type that has been suitably treated with a nodularizing agent so that all, or the major portion of its graphitic carbon, has a nodular or spherulitic form as cast. Often referred to as Ductile Iron.

Nondestructive Testing (Inspection): Testing or inspection that does not destroy the object being tested or inspected.

Original Equipment Manufacturer (OEM): The original manufacturer of a product that may be sold or marketed by another company.

Outer Diameter (OD): The dimension from a round part that measures straight through the center.

Oxidation: Any reaction of an element with oxygen. In a narrow sense, oxidation means the taking on of oxygen by an element or compound, and based on the electron theory, it is a process in which an element loses electrons.

Packing or Packing Material: Sand, gravel, mill scale or similar materials used to support castings packed in annealing pots to prevent possible warpage under high temperatures.

Parting Line: A line on a pattern or casting corresponding to the separation between the cope and drag portions of a sand mold.

Pattern: A form of wood, plastic, metal, or other material around which molding material is placed to make a mold.

Pitting: A form of wear characterized by the presence of surface cavities, the formation of which is attributed to processes such as fatigue, local adhesion, cavitation or corrosion.

Quenching: Rapid cooling or hardening; normally achieved by immersion of the object to be hardened in water, oil, or solutions of salt or organic compounds in water.

Ramming: Packing sand in a mold by raising and dropping the sand pattern flask on a table. Jolt squeezers, jarring machines, and jolt rammers are machines using this principle.

Roll Forming: a continuous process of feeding metal sheet, strip, or coiled stock, between successive pairs of rolls that progressively shape it until the desired cross section is produced.

Runout: A casting defect caused by incomplete filling of the mold due to molten metal draining or leaking out of some part of the mold cavity during pouring; escape of molten metal from a furnace, mold, or melting crucible.

Sawing: an operation in which a machine using a cutting blade with hardened teeth is used to cut material to length and/or a new shape.

Shakeout: 1) The operation of removing castings from the mold 2) a mechanical unit for separating the molding materials from the solidified metal casting.

Shell Molding: A process for forming a mold from resin-bonded sand mixtures brought in contact with pre-heated (300-500°F) metal patterns, resulting in a firm shell with a cavity corresponding to the outline of the pattern.

Spin forming: a device that uses one or more high-strength working rollers moving against a rotating sheet metal disc (workpiece) which is formed over a spinning chuck to shape a part.

Stamping: the process of cutting and shaping metal alloys into specific forms, especially to be used as components for large machinery or structures.

Stretch Forming: A forming process widely used in the aircraft industry to produce parts with large radius of curvature by primarily applying tensile forces to stretch the sheet metal over a tool or form block.

Swell: A casting defect consisting of an increase in metal section due to the displacement of sand by metal pressure.

Tapping: an operation where a tap, with teeth on its periphery, cuts internal threads in a predrilled hole having a smaller diameter than the tap diameter so that a matching piece (e.g., a screw) will fit.

Tensile Strength: The maximum stress in uniaxial tension testing, which a material will withstand prior to fracture. The ultimate tensile strength is calculated from the maximum load applied during the test, divided by the original cross-sectional area.

Threading: an operation of producing a helical ridge of uniform cross section (thread) around an external or internal form by cutting, turning, and rolling of threads into some type of material.

Tolerance: A range of dimensions that is given for a certain part labeling how close a part must be made to that specific dimension.

Tool Steel: Any high-carbon or alloy steel used to make a cutting tool for machining metals and for metal-casting dies.

Turning: the operation of revolving a piece of round stock held in a chuck, between centers, or mounted on a faceplate against a stationary cutting tool, to create a cylindrical shape.

www.smef.org.bd

Small & Medium Enterprise Foundation

Royal Tower, 4 Panthapath, Dhaka-1215, Bangladesh
Phone: +88 02 8142983, 9142907, Fax: +88 02 814344