Investment Opportunities in Odisha

Downstream Industries in Stainless Steel

ODISHA
NEW OPPORTUNITIES

With the largest stainless steel making capacity in India, Odisha presents an excellent opportunity for Ancillary and Downstream sector industries in the Stainless Steel sector to set up units in the State.

With the presence of India's largest Stainless Steel plant of capacity 1.6 MT of Jindal Stainless Steel and other Steel producers like TATA Steel, VISA Steel, NINL, MESCO in the State and dedicated location identified at Kalinganagar for setting up Stainless Steel Downstream park, Odisha is the preferred destination for Downstream manufacturers in this sector.

Coupled with competitive cost of doing business and best- in class incentive framework, the State offers a compelling value proposition for units in the Ancillary and Downstream sector.

To facilitate the investors in the sector, short profiles have been prepared with key features of various projects that an investor may consider to set up in the State. These project profiles provide information regarding the area required, approximate project cost, process, utility and manpower requirement which would assist the investors in the decision making process. This compendium provides information on 22 such select projects which could be considered for further due diligence by the investors.

I am confident that the investors, particularly in the MSME sector, will find this compendium of 'ready-to-set-up' project profiles useful.

Shri Naveen Pattnaik,
Chief Minister

Contents

1. Facility for Manufacturing of Cutlery

Name of Project	Facility for Manufacturing of Cutlery
Area Requirement	200 Sq m
Approx. Project cost	Total investment envisaged ~INR 90-110 Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 65-80 Lakhs
Project Scale	Capacity: 400 items per day
Process	**Material Preparation**: Production process starts with cutting stainless steel coils into sheets. **Blanking**: The outer contour of the piece is cut by a process referred to as blanking. **Rolling:** Through a series of rolling operations, these blanks are graded or rolled to the correct thickness and shapes required by the manufacturer's flatware patterns. **Bowl Stamping**: By means of a stamping press, bowls are given their shape. **Cutting bowl outline**: The rolled blanks are placed in the press by an operator to remove the excess metal and to fashion the shape of the bowl. This trimming must ensure an accurate fit of the pieces into the stamping dies. **Stamping the pattern**: The next step is the forming of the pattern. Each pattern has its own hardened steel dies used for the front and back patterns. These are carefully set in the stamping press by die chuck. The metal is stamped into every tiny detail of the ornamentation in the die, embossing the pattern on the piece. **Special steps—knives, spoons, and forks:** In the case of spoons, after the pattern has been embossed upon the front and back of the handle, the bowl of the spoon is formed by using a powerful press and accurate steel dies. The forming of fork prongs is a similar process to that of the forming of the spoon's bowl, but the operation takes place before the pattern is applied to the handle. After a fork is cut according to a certain outline, it is pierced and tined. The tines are pieced out, and the small piece of metal that holds the tip of the tines together is removed in another operation after the pattern has been applied. **Buffing and sand polishing**: The knives, forks and spoons are then buffed, polished and inspected. **Stamping the pattern:** The next step is the forming of the pattern. Each pattern has its own hardened steel dies used for the front and back patterns. These are carefully set in the stamping press by die chuck. The metal is stamped into every tiny detail of the ornamentation in the die, embossing the pattern on the Piece. **Special steps—knives, spoons, and forks:** In the case of spoons, after the pattern has been embossed upon the front and back of the handle, the bowl of the spoon is formed by using a powerful press and accurate steel dies. The forming of fork prongs is a similar process to that of the forming of the spoon's bowl, but the operation takes place before the pattern is applied to the handle. After a fork is cut according to a certain outline,

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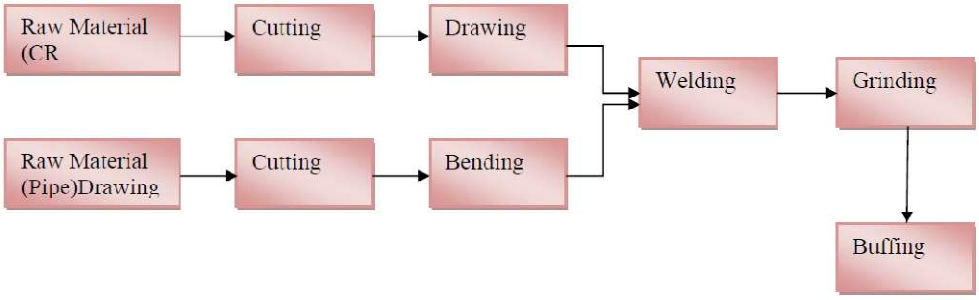
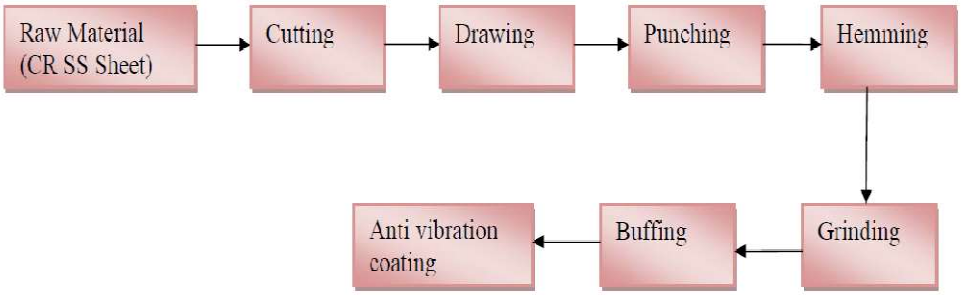
Utilities	• Electricity (connected Load) : 30-35 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

2. Facility for Manufacturing of Bathroom Fixtures

Name of Project	Facility for Manufacturing of Bathroom Fixtures
Area Requirement	200 Sq m
Approx. Project cost	Total investment envisaged ~INR 90-110 Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 65-80 Lakhs
Project Scale	Capacity: 400 items per day (Annual working days – 300)
Process	The starting material is cold rolled, stainless steel sheet in coils of the desired gauge, pipes of various sizes as per the requirement. The blanks are then fitted between dies to form the steel, by a combination of drawing and stretching steps, into the desired shape. Next, the pipes are bent into the desired shape Bent pipes are then welded by TIG welding with the already formed sheets as per the requirement. Interior surfaces and welded portions are ground and buffed to remove irregularities and to impart the finish. 
Utilities	• Electricity (connected Load) : 30-35 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	15 workers for 1 shift

3. Facility for Manufacturing of Sinks

Name of Project	Facility for Manufacturing of Sinks
Area Requirement	200 Sq m
Approx. Project cost	Total investment ~INR 90-110 Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 65-80 Lakhs
Project Scale	Capacity: 400 sinks per day
Process	The starting material is cold rolled, stainless steel sheet in coils of the desired gauge, from which rectangular blanks are cut on a forming line to the proper size, based on the final basin geometry, for the subsequent forming operations. The blanks are then fitted between dies to form the steel, by a combination of drawing and stretching steps, into the initial rim and basin shape. Next, the drain hole is counter punched at the bottom of the basin. Rims of sinks are trimmed to final geometry. Interior basin surfaces and rim surfaces for top mount sinks are ground and buffed to remove irregularities and to impart the finish. Finally, sound-dampening materials (pads, sprays, or both) are applied to the exterior under surface of the basin both to avoid collection of surface condensation and to minimize vibrations from objects (i.e., cookware, tableware, or other kitchen utensils) being dropped into the sink. 
Utilities	• Electricity (connected Load) : 40 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	11 workers for 1 shift

4. Facility for Manufacturing of Staplers

Name of Project	Facility for Manufacturing of Staplers
Area Requirement	150 Sq m
Approx. Project cost	Total investment ~INR 75-90 Lakhs. a)Land and Buildings: ~ INR 20- 25 Lakhs b)Plant and Equipment : ~INR 55-65 Lakhs
Project Scale	Capacity: 1. Staplers with a wire size of 0.017 inch- 150 staplers per day 2. Staplers with a wire size of 0.050 inch- 50 staplers per day
Process	Two types of springs are used in the basic stapler, the coil and the leaf. A coil spring is made from metal that has the ability to withstand a constant pressure and release and still maintain its shape. Leaf springs are typically made by either bending or rolling a thin piece of steel and then carefully heating it to a temperature that will cause internal stresses. Thin lengthwise into strips is then placed in ice water which causes the strips to curl up. The leaf spring allows to unlatch the base from the upper assembly. Stampings are typically made of flat sheet metal material of varying thicknesses that are sandwiched between a punch and die. After a part is stamped, it is usually then formed into a shape. If the shape is an intricate one, another type of punch and die is used. The stamped strip is heated in order to soften it, allowing the material to bend more easily. Rivets are made by cutting off a piece of bar stock and forging it to obtain the desired configuration. Plastic parts of staplers are made by injection moulding, in which a liquefied plastic is injected into a die. The liquid flows into the open void and is then cooled. As the die cools, the plastic solidifies and takes on the shape of the die. The hinge pin is cut off a certain length from bar stock with the help of a saw it is used to join top and bottom half of the stapler. The pins, stampings, and springs are sub-assembled in stages and then assembled together with the upper and lower halves of the stapler frame. For the bottom subassembly, consisting of the base, hanger, anvil, and clearing spring, the parts are placed in an assembly jig that holds them in position to allow the rivets to be placed in the correct holes. Once the rivets are locked in place, a tool called an orbital riveter spins the hollow end of the rivet until it collapses outward and captures the parts together. The top half, consisting of the magazine subassembly, the case, the follow spring, the driver-ram spring, and the metal head, is assembled the same way in its own assembly jig. The top and bottom halves come together in another jig, and the pin that connects the two and riveted into place. Finally, the finishing touches such as the anti-skid rubber pads and the plastic cap are then attached
Utilities	• Electricity (connected Load) : 50 kW

Name of Project	Facility for Manufacturing of Staplers
	• Water about 1(m^3/ day) for human consumption.
Manpower Requirement	11 workers for 1 shift (8 hours)

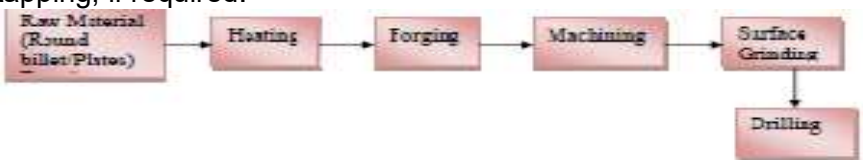
5. Facility for Manufacturing of Stainless Steel Drum and Bucket

Name of Project	Facility for Manufacturing of Stainless Steel Drum and Bucket
Area Requirement	500 Sq m
Approx. Project cost	Total investment ~INR 75-90 Lakhs. a)Land and Buildings: ~ INR 20- 25 Lakhs b)Plant and Equipment : ~INR 55-65 Lakhs
Project Scale	Capacity: 400 items per day may be considered 1. Drum: 100 drums per day 2. Bucket: 100 bucket per day
Process	**Drums:** Stainless Steel drums are manufactured through roll forming. As a continuous metal forming process, roll forming is used to roll metal sheets into ring shapes. The rolling action is actuated by roll forming equipment that are constructed from sequences of roller die pairs, positioned above and below the metal sheet. As the sheet moves through the equipment, the rollers bend the steel along the linear axis. Roll formed parts are most often manufactured at room temperatures, thus making it a cold forming process. After the steel is in the ring-shape, the ends of the ring are joined together through welding to form the drum's body. Drum's base is formed through different process cycle following the above steps. Now, the drum's base is attached to the steel rings formed in the previous step and welded together to form the leak proof drum. Now, quarter way from the top and at the bottom of the drum an indentation is formed to impart rigidity to the drum structure. As a final forming operation drum lid support is formed for proper support of drum lid. The drum lid is press formed in different operation where stainless steel circles are used as starting material. Final finishing buffing operation is done on the drum to give it an attractive look and feel. For different industries, steel drums must be manufactured to certain standards. **Bucket:** Stainless steel bucket as such is a cone shaped item for which a pre-defined developed sheet templates are available. Stainless steel sheets are cut in different sizes as per the template and formed in proper shape using the bending M/c. As explained earlier bucket bottoms are made in separate line using stainless steel circles. Bucket structure and bucket bottom are welded together to form leak proof container. Bucket handles are made using stainless steel wire/rods using rod bending machine and assembled with the help of fasteners (rivets). Finally, finishing operation is done through hand buffing to give attractive look and feel.
Utilities	• Electricity (connected Load) : 30 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	11 workers for 1 shift. More shifts may be considered for increased production.

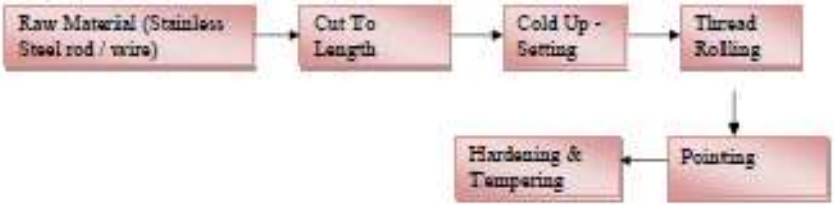
6. Facility for Manufacturing of Fasteners (Bolts)

Name of Project	Facility for Manufacturing of Fasteners (Bolts)
Area Requirement	1,000 Sq m
Approx. Project cost	Total investment ~INR 100-125 Lakhs. a)Land and Buildings: ~ INR 20- 30 Lakhs b)Plant and Equipment : ~INR 80-95 Lakhs
Project Scale	Capacity: 900 t /per year 300 Tons per day
Process	• Raw material for the fasteners is stainless steel rod / bars. The rod / bars are reheated in electrically heated forging furnace. It is then upset in the forging machine. The forged item is now machined in the lathe to get the required size. The operations followed here are: pointing, facing, grooving. • Heat treatment is done after machining to make the fasteners stronger. Hardening & tempering operations are followed. First, hardening is done such that bolt is heated to a temperature of 850-900°C and then quenched in the cooling media. • Secondly, the bolt is again reheated to bring back the extreme hardened bolt less soft, so that the bolt remains stronger. • Reheating is done to bring down the brittleness of the bolt which happened during hardening. Next is the surface finish process. Usually, grinding process is carried out to make the surface smoother according to the surface finish specification. • After finishing process, thread rolling is done with two dies. One is stationary and another is a moving die which actually exerts pressure on the bolts and forms threads. • Threads on bots may be fine, medium, coarse depending upon the application. • Rolling: Through a series of rolling operations, these blanks are graded or rolled to the correct thickness and shapes required by the manufacturer's flatware patterns. For Nut, the round bar is heated in a furnace above re-crystallization temperature. It is then hot formed to hollow hexagonal pieces of required width. The threads are tapped in the hollow portion matching with that of respective Bolt.
Utilities	• Electricity (connected Load) : ~ 800 ~1000 kW • Water about 1-2(m^3/ day) for human consumption.
Manpower Requirement	18 workers for 1 shift

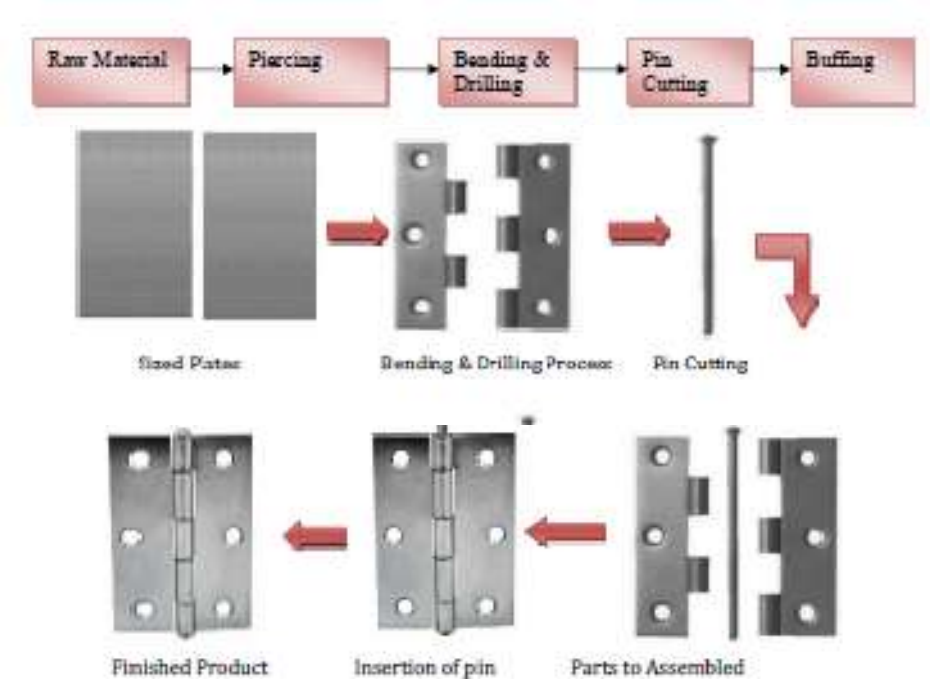
7. Facility for Manufacturing of SS Flanges

Name of Project	Facility for Manufacturing SS Flanges
Area Requirement	800 Sq m
Approx. Project cost	Total investment ~INR 90-100 Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 65-70 Lakhs
Project Scale	Capacity: 1,200t/year , Flanges :4 tons per day
Process	Raw material for the flanges is stainless steel plates. The plates are reheated in electrically heated forging furnace. It is then upset in the forging machine. The forged item is now machined in the lathe to get the required size. Heat treatment is done after machining to make the flanges stronger. Hardening & tempering operations are followed. First, hardening is done such that flange is heated to a temperature of 850-900°C and then quenched in the cooling media. Secondly, the flange is again reheated to bring back the extreme hardened flange less soft, so that the flange remains stronger. Reheating is done to bring down the brittleness of the flange which happened during hardening. Next is the surface finish process. Usually, grinding process is carried out to make the surface smoother according to the surface finish specification. After finishing process, required no of holes are drilled followed by tapping, if required. 
Utilities	• Electricity (connected Load) : ~500~700 kW • Water about $1-2(m^3/$ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

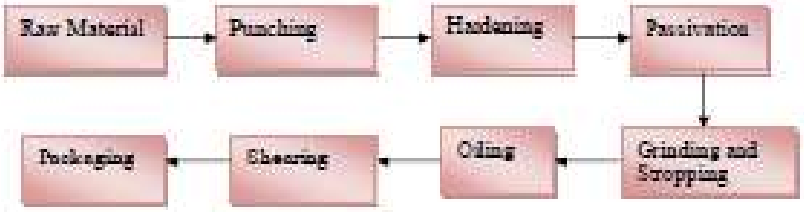
8. Facility for Manufacturing of Self – TappingScrews

Name of Project	Facility for Manufacturing of Self-Tapping Screws
Area Requirement	600 Sq m
Approx. Project cost	Total investment~INR 80-90Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 55-60 Lakhs
Project Scale	Capacity: 60,000 packets of 1,000 pieces per annum.
Process	Self-tapping Screws are manufactured on automatic machines. The sequence of operation is: 1. Making of head, by cold up setting. 2. Slotting of head, in slotting machine for gripping of screw driver. 3. Rolling of thread, on thread rolling machine. 4. Pointing at tail end for the ease of penetration. 5. Hardening & tempering of screws, in electric furnaces. 
Utilities	• Electricity (connected Load) : 50 kW • Water about 2(m^3/ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

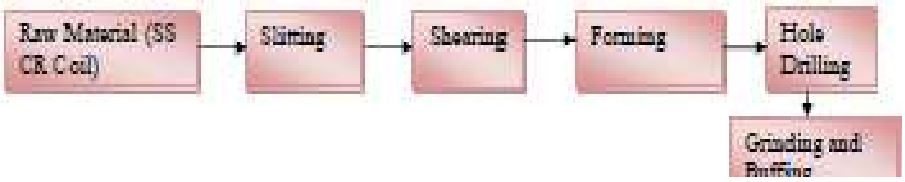
9. Facility for Manufacturing of Hinges

Name of Project	Facility for Manufacturing of Hinges
Area Requirement	600 Sq m
Approx. Project cost	Total investment~INR 150-175 Lakhs. a)Land and Buildings: ~ INR 40- 45 Lakhs b)Plant and Equipment : ~INR 110-130 Lakhs
Project Scale	Capacity: 900 t/per year Hinges of all three types: 3 tons per day
Process	.Following operations are conducted to manufacture a hinge  • Piercing:-Piercing of the stainless steel and cutting of pin. Presswork:-Bending and folding of the sheet metal on press using appropriate dies tools to obtain the hinge sand the washer parts. • Drilling Work: - After a work piece is laid out and properly mounted on Column drilling machine. • Tumbling work: - Cleaning of rust and removal of sharp edges from the products.
Utilities	• Electricity (connected Load) : 3,000 kW
Manpower Requirement	18 workers for 1 shift

10. Facility for Manufacturing of Razor Blades

Name of Project	Facility for Manufacturing Razor Blades
Area Requirement	600 Sq m
Approx. Project cost	Total investment ~INR 100-120 Lakhs. a)Land and Buildings: ~ INR 30- 35 Lakhs b)Plant and Equipment : ~INR 70-85 Lakhs
Project Scale	Capacity: 1,000 packet of razor blades per day each packet containing 5 blades
Process	Following operations are conducted to manufacture a Razor Blade:  • **Punching:-**The raw material is passed through the punching machine to get the central contour and outer profile. • **Hardening:-**Process objective is to obtain the specified Hardness of the Razor blades by imparting heat treatment process. • **Passivation:** A treatment to prevent the corrosion is provided in this machine. • **Oiling: -** Ground and stropped strip is dip inside the oil bath to prevent rust. • **Shearing:** Finally shearing is done. • **Lapping:** Grinding and stropping is done in lapping machine
Utilities	• Electricity (connected Load) : Approximately 100 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

11. Facility for Manufacturing of Stainless Steel Westwood Rims and Mud Guard

Name of Project	Facility for Manufacturing of Stainless Steel Westwood Rims and Mud Guard
Area Requirement	600 Sq m
Approx. Project cost	Total investment ~INR 80-90 Lakhs. a)Land and Buildings: ~ INR 30- 35 Lakhs b)Plant and Equipment : ~INR 50-55 Lakhs
Project Scale	Capacity: Stainless Steel Rim: 4 tons/day Stainless Steel mudguard: 1 ton /day
Process	Cold Rolled stainless steel coil slit to the desired width. The slit sheet cut to the required length. The slit and sized stainless steel sheet formed in the shape of rim or mud guard. Finally holes are drilled by column drilling machine at the appropriate locations followed by hand drilling and buffing. 
Utilities	• Electricity (connected Load) : 100 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	15 workers for 1 shift

12. Facility for Manufacturing of Stainless Steel Wire

Name of Project	Facility for Manufacturing of Stainless Steel Wire
Area Requirement	4000 Sq m
Approx. Project cost	Total investment ~INR 8.0-10.0 Crore a)Land and Buildings: ~ INR 1.5- 2.0 Crores b)Plant and Equipment : ~INR 6.5-8.0 Crores
Project Scale	Capacity: 1,500 tons per year has been considered. SS wires – 5 tons/day
Process	See table below

S .No	Process	Purpose of Operation	Control
1	Pre-Coat	Provides a suitable carrier coating for wiredrawing lubricant, thereby reducing Friction and surface damage.	• Tank temperature and Concentration. • Drying time and temperature to ensure proper pre-coat formation
2	Cold Drawn to Intermediate Size	As per the requirement and specification. For thinnergauge drawing of wire dueto increase in strength(because of work hardening)intermediate annealing maybe required	• Tight diameter tolerances. • Block cooling. • Drawing speeds. • Pass reduction schedule. • Breakdown surfacecharacteristics
3	Cleaning	To remove all surfacelubricants and ensure thatno contamination occursduring annealing.	Inspection of cleanlinessTank temperature andconcentration
4	Anneal	To soften the material sothat the final draw willobtain the requiredmechanical properties	• Temperature control to ensure consistent properties through length of wire. • Anneal line speed
5	Final Draw to Size	Specifies lubricant, finishand packaging required bythe customer	• Tight diameter and ovalitytolerances. • Proper residual coating, wax,nickel coat, oil, copper

Name of Project	Facility for Manufacturing of Stainless Steel Wire

				and/orstearate soap coat. • Cast and Helix consistency. • Die pass schedule. • Block cooling. • Mechanical properties
	6	Final Inspection & traceability verification	To control qualitative grade checking by wire production complete with a written and signed certification that all customer requirements set out by the order have been satisfied	• Diameter and ovality • Mechanical properties • Physical properties • Packaging

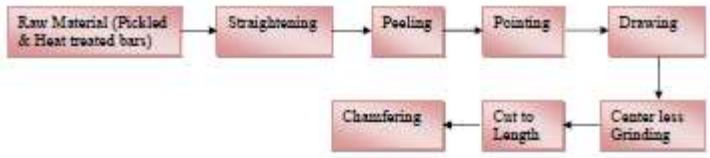
Utilities

- Electricity (connected Load) : ~800- 1,000 kW
- Water about 10(m^3/ day) industrial water and 1.5 (m^3/ day for human consumption.
- Acid (Hydrochloric Acid): 1,500 litre per month
- Chemluba: 4 Kg/ton

Manpower Requirement

35 workers for 1 shift

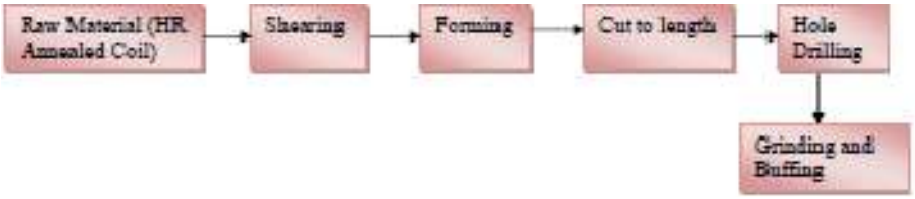
13. Facility for Manufacturing of Bright Bars

Name of Project	Facility for Manufacturing of Bright Bars
Area Requirement	1,000 Sq m
Approx. Project cost	Total investment~INR 1.40-1.75 Crores. a)Land and Buildings: ~ INR 40- 50 Lakhs b)Plant and Equipment : ~INR 1.0-1.25 Crore
Project Scale	Capacity: 5 tons/day
Process	Stainless steel bright bars can be produced by using heat treated and pickled bars as raw material. After straightening peeling is done to bars are machined to remove surface cracks, cooled layers of "skin," and oxide. Finally, bars are drawn to final shape and size followed by center less grinding and buffing. 
Utilities	• Electricity (connected Load) : ~200-250 kW • Water about 1-2(m^3/ day) for human consumption.
Manpower Requirement	22 workers for 1 shift

14. Facility for Manufacturing of Stainless Steel Pipes

Name of Project	Facility for Manufacturing Stainless Steel Pipes
Area Requirement	500 Sq m
Approx. Project cost	Total investment ~INR 2.8-3.0 Crore. a)Land and Buildings: ~ INR 70-80Lakhs b)Plant and Equipment : ~INR 2.1-2.2 Crore
Project Scale	Capacity: 2 tons/per day
Process	There are two manufacturing methods for producing pipe. They can be produced from large coils of strip or skelp, which is welded without interruption. This is called continuous production. Or they can be produced in large sizes, one piece at a time, which is called batch production. The starting material for making continuous pipe is a coil of strip or a skelp with the right thickness and width to make the required pipe size. The strip is formed through a series of rolls to make a completely uniform, circular section. Our size range includes continuous produced pipe from 1/2 through 14-inch nominal pipe size in Schedules 5, 10, 40, and 80. Batch-produced pipe covers the size range from 16 inch to 80-inch diameter. In addition to the lighter wall ranges, the batch-produced pipe includes wall thicknesses up to two inches for the largest pipes. The manufacture of steel tubes in valves the continuous forming of steel sheet strip into an open seam tube, welding of the open seam edges with high frequency resistance heating and continuous pressure jointing into welded tube, followed by reduction in tube diameter and then cutting into the desired length.
Utilities	• Electricity (connected Load) : 50 kW • Water about 4(m^3/ day).
Manpower Requirement	11 workers for 1 shift

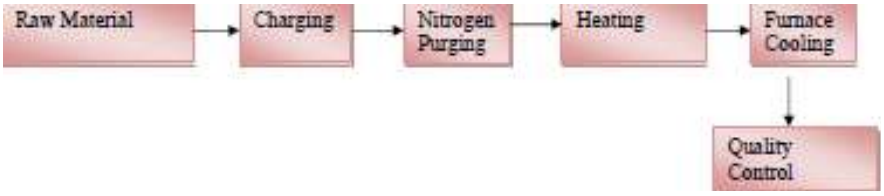
15. Facility for Manufacturing of Stainless Steel Structures

Name of Project	Facility for Manufacturing Stainless Steel Structures
Area Requirement	1,200 Sq m
Approx. Project cost	Total investment ~INR 150-175 Lakhs. a)Land and Buildings: ~ INR 40- 45 Lakhs b)Plant and Equipment : ~INR 110-130 Lakhs
Project Scale	Capacity: Stainless Steel Angles : 10 tons /day Stainless Steel Channel: 5 tons/day
Process	Hot Rolled annealed coil shall be used as raw material. The raw material is slit to the required width in HR slitting machine. The slit HR sheet is now formed in the shape of angle or channel. Finally holes are drilled by column drilling machine at the appropriate location followed by hand drilling and buffing. 
Utilities	• Electricity (connected Load) : 250 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	15 workers for 1 shift

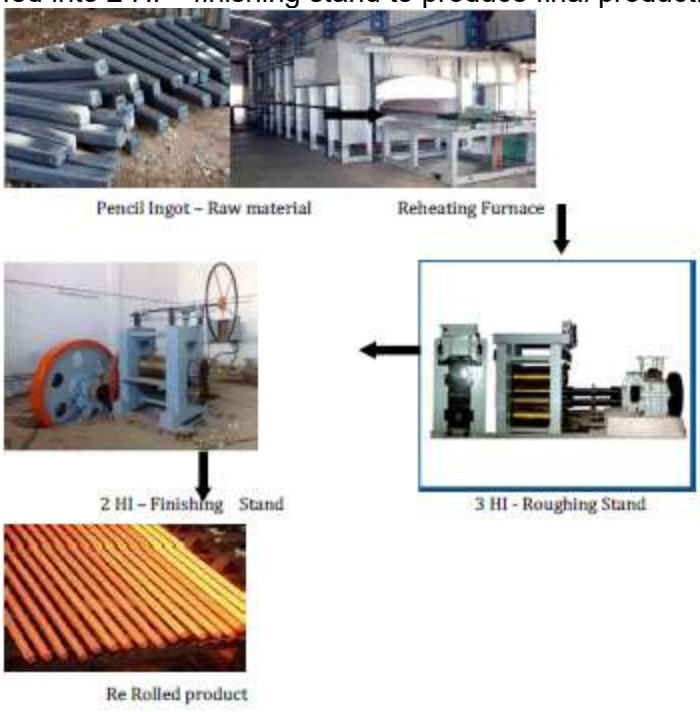
16. Facility for manufacturing of Pencil INGOT Caster for Stainless Steel

Name of Project	Facility for Manufacturing of Pencil INGOT for Stainless Steel
Area Requirement	600 Sq m
Approx. Project cost	Total investment~INR 2.0 -2.5 Crore. a)Land and Buildings: ~ INR 60-70 Lakhs b)Plant and Equipment : ~INR 1.50-1.80 Crore
Project Scale	Capacity: 10 tons/day
Process	The scrap is stored right next to the furnace for easy operation. It is charged into an induction furnace by using grab bucket attached to an overhead crane. Heat is generated by the induction of medium frequency electricity. The entire furnace system is thoroughly cooled for protection. The furnace can also be titled to pour out the molten metal. The inside surface of the furnace is normally coated with castable ceramics and fire clay in intervals of 7 days. This practice protects the furnace proper and gives a longer life. The molten metal is then poured into the crucible ladle from there it can be further poured into pencil ingot mould for casting of ingots 
Utilities	• Electricity (connected Load) : Approximately 750 kW • Water: about 70(m^3/ day) for Industry
Manpower Requirement	13 workers for 1 shift

17. Facility for Stainless Steel Annealing Shop

Name of Project	Facility for Stainless Steel Annealing Shop
Area Requirement	600 Sq m
Approx. Project cost	Total investment is ~INR 4.5-5.0 Crore. a)Land and Buildings: ~ INR 1.0 -1.25 Crore b)Plant and Equipment : ~INR 3.75-4.0 Crore
Project Scale	Capacity: Stainless Steel Cold Rolled Coil: 20 tons/day Stainless Steel Wire: 5 tons /day
Process	Cold Rolled stainless steel coil or Stainless steel wire in coil form is stacked on the furnace. The material to be annealed is covered with inner cover. Now, nitrogen is introduced inside the inner cover to make reduced atmosphere. After assuring reduced atmosphere inside the inner cover, furnace is placed. After placing furnace, annealing process started which involves heating a material to above its re-crystallization temperature, maintaining a suitable temperature, and then cooling in the furnace itself. Finally after completion of process, the material checked whether desired mechanical properties have achieved. 
Utilities	• Electricity (connected Load) : Approximately 2,500 kW • Nitrogen • Water
Manpower Requirement	12 workers for 1 shift

18. Facility for Manufacturing of Rerolling mills for Stainless Steel INGOTs

Name of Project	Facility for Re rolling Mill for Stainless steel INGOTS
Area Requirement	1,200 Sq m
Approx. Project cost	Total investment~INR 3.50-4.0 Crore. a)Land and Buildings: ~ INR 70-80 Lakhs b)Plant and Equipment : ~INR 2.50-3.40 Crore
Project Scale	Capacity: Stainless Steel Round Bars: 20 tons/day Stainless Steel Flat Strips: 5 tons/day
Process	The pencil ingot pushed inside the oil fired reheating furnace. The ingots heated up to around 1,100°C. The reheated ingot taken out from the furnace by tong to feed to 3 HI – roughing stand. Finally it is fed into 2 HI – finishing stand to produce final product.  Pencil Ingot – Raw material Reheating Furnace 3 HI - Roughing Stand 2 HI – Finishing Stand Re Rolled product
Utilities	• Electricity (connected Load) : Approximately 400 kW • Water about 10(m^3/ day) for Industrial purpose.
Manpower Requirement	20 workers for 1 shift

19. Fabrication Shops for Smaller Items

Name of Project	Fabrication Shops for Smaller Items
Area Requirement	600 Sq m
Approx. Project cost	Total investment ~INR 80-90 Lakhs. a)Land and Buildings: ~ INR 30-35 Lakhs b)Plant and Equipment : ~INR 50-55 Lakhs
Project Scale	Capacity: Small to medium sized appliances : 4,500 tons/year
Process	Following operations will be carried out in the fabrication shop: 1. Sheet metal, pipe and rod are cut to the required size. 2. Sheets are formed to required shapes in the forming machine. 3. Rods and pipes are welded with formed sheet metal by TIG welding. 4. Finally buffing is done. **Fabrication Process** 
Utilities	• Electricity (connected Load) : 25 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

20. Fabrication Shops for Larger Items

Name of Project	Fabrication Shops of Larger Items
Area Requirement	1,500 Sq m
Approx. Project cost	Total investment is ~INR 1.5-2.0 Crore. a)Land and Buildings: ~ INR 50-60 Lakhs b)Plant and Equipment : ~INR 1.0 -1.5 Crore
Project Scale	Capacity: Large size fabricated items : 12,000 tons/ year
Process	Following operations will be carried out in the fabrication shop: 1. Sheet metal, pipe and rod are cut to the required size. 2. Sheets are formed to required shapes in the forming machine. 3. Rods and pipes are welded with formed sheet metal by TIG welding. 4. Finally buffing is done. **Fabrication Process** 
Utilities	• Electricity (connected Load) : Approximately 100 kW
Manpower Requirement	25 workers for 1 shift

21. Facility for Service Center

Name of Project	Facility for Service Center
Area Requirement	200 Sq m
Approx. Project cost	Total investment ~INR 90-110 Lakhs. a)Land and Buildings: ~ INR 25- 30 Lakhs b)Plant and Equipment : ~INR 65-80 Lakhs
Project Scale	Capacity: 400 items per day
Process	Process is not specific. It depends on the machine parts to be repaired.
Utilities	• Electricity (connected Load) : 30-35 kW • Water about 1(m^3/ day) for human consumption.
Manpower Requirement	17 workers for 1 shift

22. Facility of Expanded Metal Mesh Manufacturing Unit

Name of Project	Facility of Expanded Metal Mesh Manufacturing Unit
Area Requirement	1,000 Sq m
Approx. Project cost	Total investment~INR 80-90 Lakhs. a)Land and Buildings: ~ INR 20- 25 Lakhs b)Plant and Equipment : ~INR 60-65 Lakhs
Project Scale	Capacity: Expanded Metal Mesh which includes- Regular, Flattened, Decorative Meshes and Fine Mesh: 30 tons/day
Process	1. The plate, sheet, or coil is mechanically advanced beyond the fixed bottom die in an amount that is known as the strand width in regular (standard) expanded metal. The top cutting die then descends and simultaneously slits and cold forms an entire row of half diamonds 2. .The top die then ascends and moves one half diamond right/left as the base metal moves forward one strand width. 3. The top die then descends, slits and forms another row of half diamonds, completing a row of full diamonds in two strokes. 4. The die then ascends, returning to its normal position and begins the process again until the full sheet of expanded metal is completed.
Utilities	• Electricity (connected Load) : 200 kW • Water about 1-2(m^3/ day) for human consumption.
Manpower Requirement	8 workers for 1 shift

Industrial Promotion & Investment Corporation of Odisha Limited (IPICOL)
IPICOL House, Janpath, Bhubaneswar – 751022, Odisha
Tel: +91-674-2542601-03/2542607-08 **Fax:** +91-674-2543766
E-mail: cmd@investodisha.org

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