ABSTRACT

In manufacturing process raw materials are transformed into a final product. The manufacturing process begins with the product design, and materials specification from which the product is made. These materials are then modified through manufacturing processes to become the required part. Explanation of manufacturing process can be done using process flowchart/flow diagram. A flowchart/flow diagram is a type of diagram that represents workflow or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. They are very useful for understanding complete manufacturing process. GENEXT PRECISION AUTOTECH PVT. LTD. develops and supplies fuel tanks to MAHINDRA & MAHINDRA LTD. A fuel tank (or petrol tank) is a safe container for flammable fluids. In this seminar I am going to explain the whole process diagram of manufacturing of fuel tank assembly shop, how the machining operations are actually done and different operations performed in their respective shops.

Keywords :- manufacturing process; flow process diagram; fuel tank; machining operations.
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1 INTRODUCTION

GENEXT PRECISION AUTOTECH PVT. LTD. The manufacturer of fuel tank assemblies, sheet metal pressed parts including deep drawn sheet metal pressed parts and fabricated assemblies.
Managing Director - Mr. B.M.Khairnar
Location - Plot No.E20/21, MIDC Satpur, Nashik, Maharashtra-422007,
Precision has three plants in Nashik. Additional fuel tank manufacturing facilities are located at Pune & Haridwar. 3rd plant at Nashik was established in 2009 with state of art manufacturing facilities for manufacturing xylo fuel tank assembly.
Press shop is established for medium & big size parts for various domestic customers. Highly qualified & experienced manufacturing team with ever increasing challenges related to complex part geometry, very close tolerances and delivery milestones.
Precision successfully dealt with this challenges and developed wrap around fuel tank assembly for Mahindra Maxximo.
2 LITERATURE REVIEW

Albert Boecker, Karlsruhe (2004) presented a fuel tank has a plurality of fuel System components therein and is formed by incorporating the fuel System components into the fuel tank as it is being formed. The fuel system components may be mounted on a carrier and then disposed with the carrier within a parison. Subsequently molded to form the fuel tank around the components and carrier. Desirably, all electrical, fuel and vapour lines may extend out of a single opening of the fuel tank to reduce openings in the formed fuel tank.

Huiwen Hu, Jin-Fu Wang, Kai-Ti Fan (2015) presented the development of sheet hydroforming for making an aluminium automobile fuel tank which is originally made by steel. Finite element model, including punch, blank, blank holder, binder and die cavity, is established in the first place. A commercial code LS-DYNA is used to simulate the forming process. Simulations are performed to investigate the design parameters, such as pressure, holding force, punch feeding and geometry of blank trimming, which are used for the experiment of prototyping. The prototypes of aluminium fuel tank are then fabricated and used to validate the simulation results. The experimental results show that simulations successfully predict the geometry, size, thickness distributions and location of maximum thinning ratio of aluminium fuel tank using sheet hydroforming.

René HENDLER, Graz (2016) presented a flow guide for a tank filler neck, a tank filler neck for a motor vehicle, and a motor vehicle having a tank filler neck. The tank filler neck includes a filling tube, a filler head surrounding the filling tube at the end thereof, a seal composed of an elastomer arranged between the filling tube and the filler head, and a flow guide of arranged in the filling tube or the filler head.

Matthias BorchertGerd, et al (2018) presented the invention concerns a process for the production of a container, in particular a fuel tank of thermoplastic material, by extrusion blow molding, wherein during shaping of the container within a multi-part tool the container is provided with at least one connecting element passing through the wall thereof, wherein with at least a part of the connecting element as a lost shaping male die the wall of the container is displaced from one side into a tool placed on the oppositely side of the container wall and removed. The invention further concerns a
Manufacturing of fuel tank

fuel tank with at least one connecting element which is connected to the tank wall at least in region-wise manner by intimate joining of the materials involved.

Se-Hyung Park, Gyeonggi-do (KR) (2015) presented Fuel tank comprising a noise reduction baffle and interference sections for Suppressing tank deformation in the case of application of negative pressure to said tank, the interference sections projecting inward in the tank from an upper Surface and a lower Surface thereof respectively, and being disposed so as to be substantially opposed with a special field interval between them, one of these sections being part of a fixation device which secures the baffle to the tank wall.

Takeaki Nakajima, et al (2015) presented a wave Suppression structure for a fuel tank is provided in which a wave suppression member disposed in the interior of a tank main body of the fuel tank is formed from a basket-shaped container and cylindrical porous members, the basket-shaped container being formed from two members, first and second half bodies, two of the porous members being supported in the interior of each of the first and second half bodies, wherein the wave supporting member is supported on a fuel suction pipe by joining the first and second half bodies of the basket-shaped container so as to sandwich a fuel suction pipe between a through hole thereof. This enables attachment of the wave suppression member to the fuel suction pipe to be completed without carrying out a cumbersome operation of inserting the fuel suction pipe through the through hole (38f) of the basket-shaped container or the interior of the porous member, thereby greatly improving the ease of attachment.

Hiroyuki Hagano, et al (2015) presented a flap valve mechanism in an open-close device for fuel tank includes an open-close member, a shaft Support mechanism, a spring and a gasket. The shaft Support mechanism includes bearing members and a rotation restricting mechanism. The rotation restricting mechanism includes restricting elements and restricted elements to be engaged with the restricting elements. At a first position, the restricting elements are engaged with the restricted elements, so that the open-close member is moved in a direction of warping the gasket. At a second position, the restricting elements are disengaged from the restricted elements, so that the open-close member is rotated about shaft members.
Attilio De Biasi, et al (2015) presented a fuel tank mounting assembly for mounting on a vehicle frame rail and method of installing the assembly on the vehicle frame rail to optimize the vehicle assembly line to allow for shorter takt time for the fuel tank mounting. The fuel tank mounting assembly includes a fuel tank, support brackets that each have two supporting tabs, and tank strap assemblies that attach to the support brackets to secure the fuel tank to the tank support brackets. Receiver brackets are attached to the frame rail of the vehicle, and the receiver brackets have two alignment notches that are sized to receive the two tabs of the fuel tank support brackets to couple the fuel tank to the vehicle for later permanent attachment, particularly at a subsequent assembly line station.

Hiroaki Kito, Yoshinari HIRAMATSU (2018) presented an object is to provide a fuel supply system having a filler neck formed easily with high accuracy. A fuel supply system is configured to supply fuel ejected from a fuel nozzle to a fuel tank. The fuel supply system comprises a filler neck including a resin filler neck body and a metal retainer. The filler neck body is formed in a tubular shape and has an opening end arranged to form an opening which the fuel nozzle is inserted through. The retainer is placed to cover at least part of the opening end of the filler neck body and is joined with the filler neck body in at least part of the filler neck body by thermal welding.

Roy Edward McAlister (2016) presented a fuel tank for use with hydrogen carrier fuels. The fuel tank includes a self-supporting shell having an inward facing Surface and an outward facing Surface. A fluid-tight inner layer is disposed adjacent the inward facing Surface and a fluid-tight outer layer is disposed adjacent the outward facing Surface. A vent extends through the fluid-tight inner layer, the fluid-tight outer layer, and the self-supporting shell. The fuel tank can also include a gas collection canister connected to the vent.
Scott Raymond, et al (2014) presented a fuel assembly and a method of providing fuel is disclosed. The fuel assembly includes a frame, a first fuel storage tank sized to fit within the frame and configured to store one of a liquid and a gaseous fuel, and a fuel control assembly configured to regulate delivery of the gaseous fuel to an external power unit. The fuel control assembly includes a first fuel assembly memory module having stored thereon identifying information of the interchangeable fuel assembly.

Doug SchoenTodd, et al (2014) Presented a fuel tank assembly for vehicles including a fuel tank shell having reduced wall thickness, accordingly resulting in a reduced total mass of the tank assembly. The fuel tank shell comprises two half shells connected to one another and having at least one Support member attached thereto for providing structural Support to the fuel tank shell. In particular, the Support member may be positioned internally or externally to the fuel tank with Such a positioning being selected so as to offer support in at least one area where the stress level exerted on the fuel tank shell is maximum.
3 FUEL TANK

A fuel tank is a safe container for flammable fluids. Though any storage tank for fuel may be so called, the term is typically applied to part of an engine system in which the fuel is stored and propelled (fuel pump) or released (pressurized gas) into an engine. Fuel tanks range in size and complexity from the small plastic tank of a butane lighter to the multi-chambered cryogenic Space Shuttle external tank.[1]

Typically, a fuel tank must allow or provide the following:

- Storage of fuel: the system must contain a given quantity of fuel and must avoid leakage and limit evaporative emissions.
- Filling: the fuel tank must be filled in a secure way, without sparks.
- Provide a method for determining level of fuel in tank, gauging (the remaining quantity of fuel in the tank must be measured or evaluated).
- Venting (if over-pressure is not allowed, the fuel vapours must be managed through valves).
- Feeding of the engine (through a pump).
- Anticipate potentials for damage and provide safe survival potential.

Plastic (high-density polyethylene HDPE) as a fuel tank material of construction, while functionally viable in the short term, has a long term potential to become saturated as fuels such as diesel and gasoline permeate the HDPE material.[1]

3.1 Fuel Tank Construction

While most tanks are manufactured, some fuel tanks are still fabricated by metal craftsmen or hand-made in the case of bladder-style tanks. These include custom and restoration tanks for automotive, aircraft, motorcycles, and even tractors. Construction of fuel tanks follows a series of specific steps. The craftsman generally creates a mock up to determine the accurate size and shape of the tank, usually out of foam board. Next, design issues that affect the structure of the tank are addressed - such as where the outlet, drain, fluid level indicator, seams, and baffles go. Then the craftsmen must determine the thickness, temper and alloy of the sheet he will use to make the tank. After the sheet is cut to the shapes needed, various pieces are bent to create the basic shell and/or ends and baffles for the tank. Many fuel tanks' baffles (particularly in
Manufacturing of fuel tank

Aircraft and race cars contain lightening holes. These flanged holes serve two purposes, they reduce the weight of the tank while adding strength to the baffles. Toward the end of construction, openings are added for the filler neck, fuel pickup, drain, and fuel-level sending unit. Sometimes these holes are created on the flat shell, other times they are added at the end of the fabrication process. Baffles and ends can be riveted into place. The heads of the rivets are frequently brazed or soldered to prevent tank leaks. Ends can then be hemmed in and soldered, or flanged and brazed (and/or sealed with an epoxy-type sealant) or the ends can be flanged and then welded. Once the soldering, brazing or welding is complete, the fuel tank is leak-tested.[1]

3.2 Automotive Fuel Tanks

The maximum distance a combustion-engine powered car with a full tank can cover is the product of the tank capacity and its fuel efficiency (as in miles per gallon). While larger tanks increase the maximum distance, they also take up more space and (especially when full) add to the total weight, requiring higher fuel consumption for the same performance. Fuel-tank capacity is therefore the result of a trade-off in design considerations. For most compact cars, the capacity is in the range 45–65 litres; the original model Tata Nano is exceptional with its 15 litres fuel tank. SUVs and trucks tend to have considerably larger fuel tanks.[1]

Figure 1: Typical fuel tank [2]

Image courtesy of ClearMechanic.com
For each new vehicle a specific fuel system is developed, to optimize the use of available space. Moreover, for one car model, different fuel system architectures are developed, depending on the type of the car, the type of fuel (gasoline or diesel), nozzle models, and region.[1]

Two technologies are used to make fuel tanks for automobiles:

- Metal (steel or aluminium) fuel tanks welded from stamped sheets. Although this technology is very good in limiting fuel emissions, it tends to be less competitive and thus less on the market, although until recent times automotive fuel tanks were almost exclusively made from sheet metal.

- Plastic high-density polyethylene (HDPE) fuel tanks made by blow moulding. Blow moulded HDPE can take complex shapes, for instance allowing the tank to be mounted directly over the rear axle, saving space and improving crash safety. Initially there were concerns over the low fracture toughness of HDPE, when compared to steel or aluminium. Concern for safety and long term ability to function should be considered and monitored.

Modern cars often feature remote opening of the fuel tank fuel filler flap using an electric motor or cable release. For both convenience and security, many modern fuel tanks cannot be opened by hand or otherwise from the outside of the car.[1]

### 3.3 Reserve Tank

Sometimes called the reserve tank is a secondary fuel tank (in many cars/bikes it contains around 15% of the capacity of the primary tank) these are more commonly found on bikes, older cars (some without a fuel gauge) and vehicles designed for long distance or special use. A light on the instrument panel indicates when the fuel level dips below a certain point in the tank. There is no current standard, although some efforts are made to collect this data for all automobiles. In vehicles modified for endurance the primary tank (the one that comes with the car) is made into a reserve tank and a larger one installed. Some 4x4 vehicles can be fitted with a secondary (or sub-tank) by the dealership.[1]
### 3.4 Placement And Safety

For safety considerations, in modern cars the fuel tank is usually located ahead of the rear axle, out of the crumple zones of the car. Fig:-2

![Diagram of fuel tank components](image.png)

**Figure 2**: Placement of fuel tank [3]

Automobiles such as the Ford Pinto or the models that still use the Ford Panther platform (Ford Crown Victoria, Lincoln Town Car, and Mercury Grand Marquis) are notorious for having the fuel tank behind the rear axle. Since 1980 new Ford models corrected this problem and had the fuel tank in front of the rear axle.

Ford's Pinto also sparked controversy for putting the fuel tank in a poorly reinforced area which can cause deadly fires and explosions if the car got into a rear-end collision.[3]

Likewise for safety reasons, the filler could no longer be in the middle back of the car in the crumple zone and thus had to be on the side of the car. Which side is a series of trade-offs: driver's side is easier to access, and mechanically simpler for gas cap locks; passenger side is safer (away from passing traffic in roadside fill-ups). Asymmetric sliding doors may also dictate placement and some minivan doors will collide with a fillip in progress. Proper design and construction of a fuel tank play a major role in the safety of the system of which the tank is a part. In most cases intact fuel tanks are very safe, as the tank is full of fuel vapour/air mixture that is well above the flammability limits, and thus cannot burn even if an ignition source were present (which is rare).
Manufacturing of fuel tank

Bonded oil tanks are used for safely storing domestic heating oil and other hazardous materials. Bonding is often required by insurance companies, rather than single skinned oil storage tanks. Several systems, such as Battle Jacket and rubber bladders, have been developed and deployed for use in protecting (from explosion caused by enemy fire) the fuel tanks of military vehicles in conflict zones.[3]
4 MANUFACTURING PROCESS FLOW-DIAGRAM OF FUEL TANK IN GENEXT PRECISION AUTOTECH PVT. LTD.

4.1 Raw Material Receiving

The raw material use for the manufacturing of fuel tank is:

1. Al-Si (Aluminium silicon)
2. CR-D/EDD (rolled sheets)
3. HRPO (Hot rolled pickled and oiled sheet) steel

Each mechanical property of galvanized steel rolls, including the hardness, tensile strength, elongation, and yield strength, is tested before entering the main production
Manufacturing of fuel tank

facility. Other specifications of the steel rolls, such as weight, thickness, length, width and packing, are checked after entering the production facility.[4]

Notwithstanding the advantages of using steel **fuel system** components, the weight penalty and ever present potential of leakages and corrosion paved the way for the introduction of plastics in the 1970’s. As market and legislative demands increased new plastic materials were developed which have improved fuel system performance in all the key areas: Safety, permeability, weight, packaging, cost and durability to name a few.[5]

4.2 Shearing/Cutting

The sheets are now cut using HYD shear machine as shown in fig no.4 Sheets are being cut in their standard size for the shell forming of fuel tank.

Before placing the cutting die on the bed, the operator will check the production manual of the cutting die. The content of the manual includes the following.

- Fuel tank part number
- Die part number
- Number of works required
- Jigs required for the cutting process

The first half tank from the cutting die is checked with the dimensions.[6]
4.3 Shell Forming

The first step is checking the die(tooling). The checklist includes the fuel tank part number, production manual, and the die surface. Before placing the die on the stamping press bed, the operator checks the production manual of the forming die. The content of the manual includes the following.

- Fuel tank part number
- Die part number
- Required galvanized steel plate thickness, length, and width
- Bolster plate pin map
- Required hydraulic press pressure
- Required die cushion pressure
- Additional information for production

The thickness, length, width, and weight of the steel plate are checked again right before stamping press. This procedure ensures the strength of the fuel tank reaches the requirement. The first piece of the formed half tank from the stamping press is checked with metal fatigue by senior supervisor. In addition, the diameters, depth, and other relevant parts of the fuel tank is examined. All the defective parts will be disposed. At the same time, by comparing with the original equipment manufactured part, each fuel tank that comes from the stamping press is checked one by one.[5]

Various hydraulic press machines are available for the shell forming and other operations to be performed on the sheet for shell formation of fuel tank.

1. HYD 400T
2. MECH 300T
3. MECH 200T

![Figure 5: Shell forming of sheets [7]](image)
In fig no 6 the sheets are been formed in the shell of fuel tank, top part and as well as bottom part.

**Figure 6:** shell formed sheets [7]

### 4.4 Cleaning Area And Top/Bottom Punching

The top and bottom parts are then cleaned with kerosene to remove unwanted dust particles settled on the parts. Temporary punching is done between top and bottom part of fuel tank

### 4.5 Top Part (Spot Welding)

The spot welding amperage needs to be adjusted according to the mechanical property of the material. The adjustment includes current, duration, testing tool, and testing method. Alignment spot welding ensures the pan is in the correct position inside the fuel tank. It is examined by using the original sending unit. This process ensures the pan inside the tank will not interfere the sending unit.[5]

**Figure 7:** top part soldering [8]
4.6 Neck Brazing

The brazing of neck is done on the top part of the tank using brass metal.

The filler neck for receiving a fuel supply nozzle for a motor vehicle fuel tank includes a one-piece seamless funnel member having a tubular body. The funnel member defines in off-set axial relation a relatively large inlet opening adapted for attachment to a receptor for the nozzle and a relatively small necked down outlet opening adapted for attachment to the inlet of an elongated tubular member in communication with the fuel tank.[9]

As in the below fig no 8 neck filler pipe is shown

![Figure 8: Neck brazing for filler pipe](image)

4.6.1 Return Line Tube Brazing

4.6.2 Fuel Inlet Pipe Brazing

Return line tube and fuel inlet pipe brazing is done for transferring of fuelling the tank system, the lines are shown in fig no 9 below
4.7 Bottom Part (Spot Welding-Inner Container, Baffles)

Baffles stop the fuel (and the weight) suddenly shifting around as the car moves. Fuel is heavy. If you have a nearly full tank and corner hard, a lot of weight shifts to the outside of the curve, just where you don't want it. Baffles help to keep it where it's less likely to make you spin off the road. If the baffle plates would not be there in the tank then the centre of gravity in a vehicle will change with vehicle climbing up or decelerating on a road, thus making the vehicle go out of control.

The baffles are shown in fig no 10 they are too spot welded in the bottom part of tank.[9]
4.8 Top And Bottom Half Closing (Spot Welding)

Pre Assembly - Spot Welding

This process puts the upper and lower fuel tank together. A 2-pin jig is used to make sure the two pieces are aligned correctly.

Again, the first production part is examined by comparing with the original sample. In below fig no 11 the spot welding machine is shown and the process of half closing (spot welding) is shown.

![Spot Welding Machine and Process](image)

Figure 11:- half closing of top and bottom part using spot welding machine [12]

4.9 Seam Welding Full Closing

4.9.1 Roller Seam Welding

Roller seam welding is a resistance welding process. This technique is used in sheet-metal working whenever continuous, tight weld seams are required.

Roller seam welding is derived directly from spot welding. It is used for processing thin sheets. The work pieces are joined using electric current and pressure.[5]
4.9.1.1 Technology

The technology works in the following way: In a roller seam welding process, a robot moves two copper rollers arranged one above the other along a component. The current flowing through these copper rollers makes contact with the component in concentrated form. Simultaneously, the individual work pieces are pressed against each other. This produces a multitude of spot welds that create a continuous and tight seam. Metal working whenever continuous, tight weld seams are required.[5]

4.9.1.2 Advantages:

- Roller seam welding is based on the same process principle as spot welding. The process has two main advantages when compared to spot welding:
- Roller seam welding is capable of producing a continuous seam. For many products, this impermeable seam is absolutely vital.
- In addition, it is possible to achieve faster cycle times than in spot welding.[5]

4.9.2 Seam Welding Machine For Vehicle Fuel Tank

The diagram of roller seam welding machine is shown in fig no 12.
4.9.2.1 Technical Specifications
The Purpose of this machine is for seam welding of fuel tanks. This machine is specifically used for welding of coated sheets.

- The machine is called a Narrow Track Seam Welding Machine.
- The seam welding wheels are driven by knurl wheels that maintain the width and half round shape of the electrode.
- Knurl wheels apply a pressure through hydraulic cylinders, operated by a hydro-pneumatic booster unit.
- Water Cooled Seam Welding Transformer is used
- Microprocessor based welding controller
- Electrode Housing with Silver bearing for top & bottom
- Speed of motor controller by VFD (variable frequency drive)

4.9.3 Main Assembly – Wheel Welding
This process seals the upper and lower fuel tank. Similar to spot welding, the amperage needs to be adjusted. The process is shown in fig no 13.

![Main assembly seam welding process](image)

Figure 13:- Main assembly seam welding process [13]

4.10 Leakage Testing
Digital Gauge with light suggests sufficient pressure inside fuel tank. Lower the chance of misread fatigue human eyes after long hours operation compared with traditional gauge.
Manufacturing of fuel tank

The leaking test device is operated according to the operating manual, which is tailor-made for every fuel tank.

Different capacity of fuel tank requires different pressure to perform testing. The meanwhile, the testing is performed under a pool. If the tank leaks, visible bubble will burst out from leakage area. Any leak will be easily detected under this environment.[14]

In fig no 14 the process is shown

![Image of fuel tank testing](image)

Figure 14:- leak testing of fuel tank [15]

- Pressure - 0.3 bar
- There are chances of leakages near joints of Seam welding; spot welding & brazing etc. are checked, using Water in leakage testing tank.

Below table is of the defects detection and the actions taken on it.

<table>
<thead>
<tr>
<th>Defects</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seam welding defects</td>
<td>Reject</td>
</tr>
<tr>
<td>Spot welding defects</td>
<td>Reject</td>
</tr>
<tr>
<td>Brazing</td>
<td>Rework</td>
</tr>
</tbody>
</table>

4.11 Cleaning

After leak testing the tanks are cleaned to avoid any water droplets in tank and to prevent rust as well. The pre washing process removes all the grease, dirt and dust on the fuel tank.
4.12 Powder Coating

- Powder coating is done to prevent rusting of fuel tank & for aesthetic look.
- First the powder is spread on the entire part to be coated in the spray booth.
- The parts are then kept in the oven at high temperature (160 to 180 deg.)
- Powders used for coating:
  - EP Black matt (For fuel tank & other parts)

The painting process consists of painting and heating. After painting, the conveyor brings the fuel tank to the oven. The heating process ensures the paint on the surface of the fuel tank is adhered.

In below fig 15 the process of powder coating is shown and in fig 16 the tank before coating and after coating is shown.

![Figure 15: Powder coating](image1)

![Figure 16: Fuel tank before and after powder coating](image2)
4.13 Diesel Cleaning

Clear-Diesel Fuel & Tank Cleaner is an advanced diesel fuel and tank cleaning technology. Water has always been a problem in diesel fuel. But today’s cleaner-burning fuels have dramatically reduced sulphur content and are more prone to water separation, contamination and are inherently unstable. This Fuel Polishing Formula removes water and slime, disperses fuel contaminants and stabilizes fuel during long-term storage. It can be used as a vital part of any preventive maintenance program or for immediate clean-up of equipment or fuel storage tanks. Add Clear-Diesel at least quarterly or as needed.

Benefits:

- Disperses diesel fuel contaminants
- Removes water and slime
- Petro fresh provides maximum long-term storage stability – keeps fuel fresh
- Prevents premature fuel-filter plugging
- Protects against fuel tank corrosion

4.14 Pre-Dispatch Inspection

Each fuel tank is packed according to the part number on the tank surface. In addition, 3% of the packed fuel tanks are tested again for surface check and leaking before entering the warehouse.

Some tanks are tested in Millipore lab as:

- There are some metallic/non-metallic impurities present inside the tank after the diesel cleaning.
- Millipore testing gives quantitative analysis of these impurities inside the tank.
- It is done using filter paper (5 micron) and the chemical (Lascar A86 & IPA 10%)
- Heating at temperature range 70-80 degree Celsius in 15 min.[6]
4.15 Packing And Dispatch

At last fuel tank is packed carefully and finally dispatched to the logistics.

Figure 16: packing and dispatching of fuel tank [7]
5 CONCLUSION:-

The primary aim of seminar is to observe and study the manufacturing process used for production of Fuel Tank and various machining operations performed on Fuel Tank in industry.

For this purpose I visited to Genext Precision Autotech Pvt. Ltd. Industry and studied:

1) Manufacturing process of fuel tank assembly for Mahindra vehicles.
2) How the raw material is transformed into a final fuel tank assembly.
3) Each and every operation carried in their respective shop.
Manufacturing of fuel tank

6 REFERENCES:


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4) http://www.fueltank.com.tw/process/process01.html

5) LC Fuel Tank Manufacture CO., Specialize in fuel tank, fuel tank strap, filler neck, oil pan, sending units and forklift part. ISO 9001 certificate


7) Genext precision industry

8) http://www.fueltank.com.tw/process/process02


11) https://www.google.co.in/search?q=return+line+tube+and+fuel+inlet+pipe+in +fuel+tank&rlz=1C1CHBD_enIN743IN743&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj5n-PCqsTaAhWLo48KHS3_BaYQ_AUICigB&biw=1366&bih=662#imgrc=tjJJT K3qf5QsAM:

12) http://www.fueltank.com.tw/process/process03


15) https://www.google.co.in/search?rlz=1C1CHBD_enIN743IN743&biw=1366&bih=662&tbm=isch&sa=1&ei=c37XWufeBIftvgTt_piADg&q=leak test..0.13.876...0i67k1j0i24k1.0.MNkqb4yOyTc#imgrc=EPkxfvHot1tmNM:
Manufacturing of fuel tank