

RV INSTITUTE OF TECHNOLOGY AND MANAGEMENT
Department of Mechanical Engineering

INDUSTRIAL VISIT REPORT

A complete report on Industrial Visit organized by RV Institute of Technology and Management for the students of Mechanical Engineering department pursuing 7th semester to know the actual industrial experience and the advanced processes involved in industries for processing of raw materials to obtain final product.

We the students of 7th semester heartfully thank principal Dr. Jayapal R, HOD, Dr. C. Solaimuthu and our faculty coordinators Dr. Durga Prasad C, Dr. Harish.H, Dr. Manish Kumar, Mr. Prajwal.B.M for organizing the industrial visit.



Group Photo of Industrial Visit

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KIOCL – Industrial Visit Photo

DETAILS OF JOURNEY

RV Institute of Technology and Management had organized industrial visit to KIOCL (Kudremukh Iron Ore Company Limited), Mangalore on 27/11/2023 and Apple plywood's, Mangalore on 28/11/2023.

The industrial visited was guided and supported by our faculty coordinators Dr. Durga Pasad.C , Dr. Harish.H, Dr.ManishKumar, Mr. Prajwal.B.M.

There were 25 students belonging to 7th semester accompanied by 4 faculty coordinators.



Apple Plywood

COMPANY PROFILE AND GROUP OBSERVATION

KIOCL(Kudremukh Iron Ore Company Limited)-27/11/2023

We had reached the KIOCL industry area at 9.30 am on 27/11/2023. One of the guide from KIOCL engaged us through all the different manufacturing sectors of KIOCL.

KIOCL Limited, formerly known as Kudremukh Iron Ore Company Limited, is a government-owned company in India. It was established in 1976 and is headquartered in Bengaluru, Karnataka. The primary objective of KIOCL is to explore and exploit iron ore deposits in the Kudremukh region of Karnataka.

KIOCL is involved in the mining, beneficiation, and export of iron ore. The company operates iron ore pellet plants in Mangalore, Karnataka. Palletization is a process of converting iron ore fines into pellets, which can be used as a raw material in blast furnaces for the production of steel. The pellets produced by KIOCL are primarily intended for export.



Briefing about KIOCL

Here's a simplified explanation of the pelletization process:

Raw Material Preparation:

Iron ore fines, which are small particles of iron ore, are obtained from mining operations. The fines are crushed into a powder-like consistency.

Mixing and Agglomeration:

The powdered iron ore is mixed with a small amount of binding agents, such as bentonite clay. Water is added to the mixture to form a slurry.

Pelletizing:

The slurry is fed into pelletizing equipment, which can be a disc pelletizer or a drum pelletizer. As the equipment rotates, the fine particles adhere to each other and form small, spherical pellets. The binding agents help hold the particles together during this process.



Pelletizing

Drying:

The freshly formed pellets are typically wet, so they are transferred to a drying unit.

In the drying process, excess moisture is removed from the pellets, making them suitable for handling and transportation.

Induration (Heat Treatment):

The dried pellets are then subjected to high temperatures in a furnace in a process called induration. This heat treatment strengthens the pellets and imparts the necessary physical and metallurgical properties.

Cooling:

After induration, the pellets are cooled to room temperature.

The cooling process stabilizes the pellets and prevents them from breaking during handling and transportation.

Unfortunately, mining at Kudremukh was stopped in 2005 for environmental reasons and at present raw material is imported from Odisha, Chhattisgarh and other countries like Brazil.



Induration

APPLE PLYWOODS
28/11/2023

We had to reach the Apple plywood at 10.45am. We were guided by Dr. Prasanth M.A, Director of AK group. A K group has been established four decades ago, it has grown to become one of the largest and also a well-positioned as one of India's long-term manufacturers of allied wood products, currently offering the widest range of products.

The company's ability to innovate and modernize continuously has helped it to be one of our country's leading manufacturers. In its journey, through the years it has acquired many laurels and has been awarded numerous hallmarks of quality. It has built a reputation for being able to deliver consistent quality concerning every aspect; including an uninterrupted supply now and forever.



Explanation by Dr. Prasanth, M.A, Director of AK group

All the manufacturing process is carried out with help of suitable production equipment's in a suitable working environment. A brief description of manufacturing process is as follows. Timber logs are cut into required sizes brought into peeling section from timber yard and fed to peeling machine for peeling the core veneers. Presently they are purchasing face veneers from our sister concerns. Company uses timber logs for peeling that are recommended by Indian Standard annex B 2 of IS303:1989.

Peeling: core veneers: The logs are mounted on the peeling machine after making center points to the both sides of logs and core veneers are rotary cut to the required thickness of for 1.80mm +/- 5% for core veneers.

Chopping: Further core veneers are cut into required dimension by using chopping machine. Veneer treatment: Veneers from non-durable species and sapwood of all species when used for plywood manufacture shall be soaked in 1.25% solution of boric acid and 1.9% solution of borax at a temperature of 85-900C for a period of 30 minutes.

Drying: Core veneers are drying in mechanical dryer for 6-8% moisture content. Dry cutting & sorting: The dried veneers are stored as per company requirements and cutting the both edges of core veneers to eliminate the core gap overlap.



Peeling

Glue Mixing: They purchase MR and BWR grade resin from our sister concern for bonding the veneers which is conforming to 848:2006. Extenders may be used with the adhesives in the manufacture of plywood.

Glue Spreading: Selected core veneers after dry cutting are brought to the glue spreader for applying glue mechanically and visually examine the glue spreaded core veneer to ensure uniform distribution of glue.

Assembling: On the plywood assembling table the aluminum plates are carefully placed and a visual examination of the surface is carried out to ensure that the surface is free from any foreign bodies. Carefully lay the face veneer after the inspection for any cracks and lay the side cut glued core veneers to ensure a continuous surface without overlap or core gap. Panel core has to be carefully cross laid to the glue core. Assembling will complete as per the thickness of the plywood then face veneer will lay on it and aluminum plate is kept over it, process will be repeated based on the capacity of the hot press.

Hot press: Assembled veneers are loaded in to the hot press by using scissor lift and temperature of 1400C to 1450C and specific pressure of 14Kg/cm² for BWR grade plywood and 1050C to 1100C for MR grade plywood and timings are given as per requirement of thickness. (Hot press time chart is attached as annexure) After pressing, the material is unloaded and stacked for the cooling.

DD saw trimming: The plywood's after hot pressing and cooling is inspected visually for any overlap or core gap on the surface. The edge of the plywood is then trimmed using DD saw and checks for dimension.

Sanding & Finishing: Trimmed sheets are then sanded both sides to obtain smooth surface by using sanding machine and side finishing are done manually with sand papers.



Finishing section

Treatment: Surface application of preservative is done by brush. Applying two coats of preservatives, the second and subsequent coats will be applied when the first has partially dried. The composition of preservative is copper- chrome- boron.

Final finishing: Final finishing on the plywood will give after drying, if require. Lab testing: Finished each control units of plywoods are testing in our laboratory by selecting the material randomly as per IS 303:1989.

Stacking & dispatching: Quality checked plywoods are stacked in designated area and material will dispatch as per schedule after the proper stamping.

CONCLUSIONS

We are thankful for all our faculties for organizing such an Informative event for us in crucial for development of our practical skills and knowledge.

We got the knowledge on different types of machines used in KIOCL for process of palletization and various technologies used in plywood industry and had an opportunity to research on it.

We hope to get more chances further to have such an informative & wonderful experience of visiting different industries.

