

ENERGY EFFICIENCY AND EXPECTED BENEFITS

ALUMINA

- a) Replacement of existing rotary kilns with stationary calciners.
 - 1. Fuel oil saving to the extent of 30%
 - 2. Low operation and maintenance cost.
 - 3. Better quality alumina.
 - 4. Greater plant availability.

- b) Adoption of the tube digestion system for dissolution of predominantly monohydrate bauxites.
 - 1. Lower heat consumption
 - 2. Flexibility in processing of wide range of bauxites.
 - 3. Low digestion time.
 - 4. Better recovery of alumina.
 - 5. Improved setting rate of red mud.
 - 6. Decreased evaporation requirement.
 - 7. Easy maintenance and lower capital and operating costs.

- c) Removal of impurities from plant liquor.
 - 1. Improved liquor productivity.
 - 2. Improved quality of product.
 - 3. Better heat transfer co-efficient.
 - 4. Recovery of valuable byproducts.

- d) Adoption of dry disposal of red mud.
 - 1. Lower pollution.
 - 2. less area requirement.
 - 3. Lower cost of equipment in settling, washing area and pond.

- e) Use of variable speed drives for major process pumps and large motors in the plant.
 - 1. Reduced requirement of electrical power.

- f) Provision of mechanical agitation or improved air agitation system in precipitation unit.
 - 1. Reduces electrical power consumption.
 - 2. Better classification of hydrate.
 - 3. Lower compressed air consumption at reduced air pressure.

- g) Modernization of process control system in plants.
 - 1. Improve upon existing raw material and services requirements.
 - 2. Better plant operation.
 - 3. Better labour productivity.

ALUMINIUM

- a) Improvement in cell design
 - 1. Increased current intensity and efficiency.
 - 2. Higher productivity.

- b) Redesigning of bus bar arrangement.
 - 1. Stable cell operation.
 - 2. Increased productivity.
 - 3. Increased current efficiency.

- c) Provision of improved alumina transportation system.
 - 1. Minimise the mechanical losses.
 - 2. Reduced conveying cost.

- d) Provision of mechanized and automated cell operations.
 1. Increased current efficiency.
 2. Higher productivity.
- e) Provision of dry scrubbing system for gas cleaning and recovery of fluorides.
 1. Lower investment cost.
 2. Better recovery of valuable fluorides.
 3. Improved pollution control.
- f) Computerisation of baking furnace firing system.
 1. Produce anodes of superior properties.
 2. Increase productivity.
 3. Anodes free from surface burns.
 4. Increase furnace refractory life.
- g) Refining of aluminium to super-purity level.
 1. Introduction of new technology in the country.
 2. Import substitution.

SEMIS

(i) Casting of slabs and billets

- a) Electromagnetic casting
 1. Scalping operation eliminated.
 2. Reduction in initial investment.
 3. Lower product cost.
 4. Better product quality.
- b) Hot top casting of billets with air-slip process.
 1. Improved product quality.
 2. Better yield.
 3. Higher productivity.

(ii) Rolling

- a) Thin strip casting with cold rolling.
 1. Elimination of homogenizing/preheating, scalping, hot rolling, etc.
 2. Low capital investment, production cost.
 3. Better yield and productivity.
 4. Energy saving upto 33%.
- b) Introduction of automatic gauge, flatness and crown control systems.]
 1. Improved product quality.
 2. Better yield.
 3. Improved sale ability of products.
- c) Quick work roll changing system.
 1. Improved productivity.
 2. Higher output and flexibility from the mill.
- d) Incorporation of higher speed and higher coil size.
 1. Improved productivity.
 2. Better yield.
 3. Lower production cost.
- e) Improved design features for heat treatment furnaces.
 1. Improved yield.

2. Better productivity and products quality.
3. Energy savings.
4. Reduction in production cost.

(iii) Extrusion

- a) Introduction of new handling system for dies, billets and extrusion products.
 1. Improved yield, productivity and product quality.
 2. Reduced production cost.
- b) Introduction of efficient heat treatment (Air & Water quenching on run-out table).
 1. Improved quality.
 2. Better yield and productivity.
 3. Reduced production cost and capital investment.
- c) Improvement in die manufacturing processes.
 1. Improved yield, productivity and product quality.
 2. Reduced production cost.
- d) Installation of combined direct/indirect extrusion press.
 1. Availability of high strength and wide extruded products.
 2. Import substitution for defense, transport sectors, etc.
- e) Installation of Confirm extrusion process.
 1. Higher yield, high productivity.
 2. Improved quality.
 3. Reduced production cost.
Operational flexibility.

(iv) Redraw rod stock

- a) Processing of intermediate and high strength alloy rods.
 1. Improved yield & productivity.
 2. Reduced production cost.
 3. Energy saving.
 4. More uniform product quality.

(v) Alloy & composites

- a) Production and processing of special alloys like ultra light. Super plastic alloys, etc., and various composites.
 1. High strength to weight ration.
Enables energy savings.
 2. Import substitution.

(vi) Energy utilisation

- a) Selection of processes and equipment for energy conservation.
 1. Energy saving.
 2. Reduced cost of production.

Source:

The above report has been extracted from the book
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