Cluster Profile
Mixed industries, Mehsana

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Promoting Energy Efficiency in SMEs
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India

For more information

Project Monitoring Cell
T E R I
Darbari Seth Block
IHC Complex, Lodhi Road
New Delhi – 110 003
India

Tel. 2468 2100 or 2468 2111
E-mail pmc@teri.res.in
Fax 2468 2144 or 2468 2145
Web www.teriin.org
India +91 • Delhi (0)11

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Mixed industries cluster, Mehsana

Overview of cluster

Mehsana is one of the mixed engineering clusters in the state of Gujarat. There are an estimated 1,345 MSME units[1] in Mehsana which are diverse in nature. A majority of the units is plastic industry, road construction equipment manufacturers, corrugated boxes industry and micron powder units. The cluster is spread within Mehsana and neighbouring Gujarat Industrial Development Corporation (GIDC) industrial estates.

The cluster has large, medium, small and micro industries. The types of products manufactured in the cluster include PVC pipes & fittings, polybags, woven & non-woven sacks, household items (buckets, chairs and roll straps), etc. Plastic industries and road construction equipment manufacturing industries constitute for more than 70% of total industries in the cluster. Some of the major industries in the cluster include Vimal Microns Ltd, Bhumi Print Pack, Aksharchem India Ltd and Ashitech Fabrication. Mehsana mixed engineering cluster provides employment to about 4000 people. A majority of plastic industries is associated with plastic pipe and bags manufacturing industries while Mehsana is known as one of the largest providers of road construction equipment in the state.

The total number of industries in the cluster is close to 100 (table). The annual turnover[2] of Mehsana medium scale industries cluster is estimated to be Rs 700 crores.

Distribution of engineering units in Mehsana cluster

Industry type	Number of units
Plastics	40
Road construction equipment	32
Micron powder	11
Corrugated boxes	17
Total	100

Product types and production capacities

Mehsana industries are involved in the production of a variety of products, which are used in different end-use sectors such as domestic, industrial, municipality, service and agriculture sectors. The primary products manufactured in [1]the cluster are as follows:

[1] *1,2. Brief Industrial Profile of Mehsana District, MSME DI Ahmedabad*

Distribution of engineering units in Mehsana cluster

Industry type	Primary products
Plastics	• Pipes & fittings • Shetes/ bags/ granules
Road construction equipment	• Asphalt • Drum mixer and wet mixer • Bitumen sparyer • Road sweeper
Micron powder	• Micron powder
Corrugated boxes	• Corrugated box different sizes

The installed capacity and production of similar type of industries vary with each unit. The production is recorded in terms of tonne. The total production of different products in the cluster is estimated to be 67,320 tonne per year. The break-up of production from different types of industries is shown in the table.

Distribution of industry types in Mehsana

Production data of Mahsana mixed industries cluster

Product category	Number of units	Production (tonne/year)
Microns powder	11	12000
Road construction equipment	32	13920
Plastic carry bag, granules & pipes	40	20400
Corrugated boxes	17	21000
Total	100	67320

Raw material usage in cluster

The primary sources of raw material for different products are from various locations in India. Depending on type, quality and source, the costs of raw materials vary. Different raw materials used in manufacturing of plastic products include the following:

Plastic products

- High Density Polyethylene (HDPE)
- Low Density Polyethylene (LDPE)
- Linear Low Density Polyethylene (LLDPE)
- High Molecular High Density Polyethylene (HMHDPE)
- Medium Density Polyethylene (MDPE)
- Polypropylene (PP)

Road construction equipment

- Mild steel (MS) sheets
- Auxiliaries - Gears, chains, electric motors

Corrugated boxes

- Craft paper
- Plastic straps

Micron powder

- Dolomite, Calcite stone/lumps
- Coating/ resins

Corrugated box - Craft

Micron powder – Dolomite/ calcite stones

Road construction equipment (MS plates and channels)

Plastic industries (Recycled plastic for plastic granules)

Energy scenario in the cluster

Electricity, wood and NG are the major sources of energy for different. Electricity is sourced from Uttar Gujarat Vij Company Limited (UGVCL). Coke is procured from different distributors and Natural gas is supplied by Sabarmati Gas Limited. The details of major energy sources and tariffs are shown in table.

Prices of major energy sources

Type	Source	Remarks	Price
Wood	Local market	Low ash	Rs 23,000 - 28,000 per tonne
Electricity	UGVCL	LMTD	Energy charge : Rs 4.6 per kWh Demand charge: Rs 90 per kW per month
		HTP-I	Upto 500 kVA demand Energy charge : Rs 4.0 per kWh Demand charge: Rs 150 per kVA per month Above 500 kVA and upto 1000kVA demand Energy charge: Rs. 4.2 per kWh Demand charge: Rs. 260 per kVA per month in excess of 1000 kVA Demand charge: Rs. 475 per kVA per month Excess demand charge: Rs. 555 per kVA per month
Natural Gas	Sabarmati Gas	-	Rs. 25 per SCM

The sources of major raw materials of different industries are shown in the table.

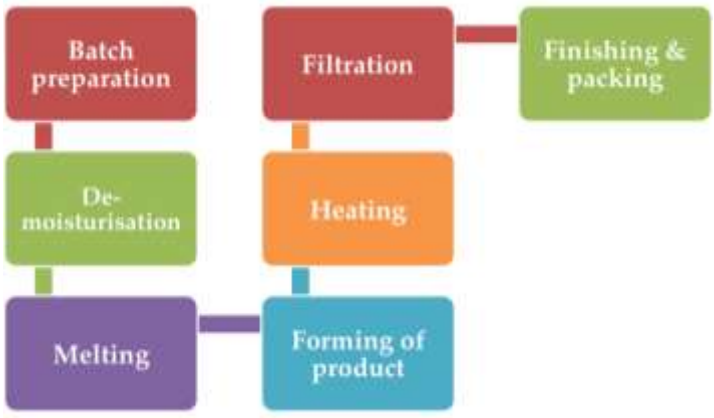
Sources of raw materials

Raw material type	Source
HDPE/LDPE/PVC	Reliance/ IOCL/ GAIL
MS Sheets	Local suppliers
Gears/chains/motors/nut & bolts	Local suppliers
Craft paper	Local vendors from Gujarat
Plastic straps	Local vendors from Gujarat
Dolomite and Calcite stones/lumps	Rajasthan
Resins	Local vendors

Production process

(i) Plastic products

The plastic products are made either in continuous mode following extrusion methods or intermittently through blow moulding process. In extrusion method, initial forming of ready-to-shape batch material takes place in pre-designed die heads, which is further passed through different process steps depending on final productI In moulding, ready to shape batch material is injected (or injected with blow of air in case of blow moulding) into pre-shaped mould to produce the target products in one step. Both methods follow broadly similar primary steps such as preparation of batch, forming and finishing operations to produce desire products. The generic process steps of manufacturing plastic products are explained below. The generic production steps for plastic products are shown in figure.

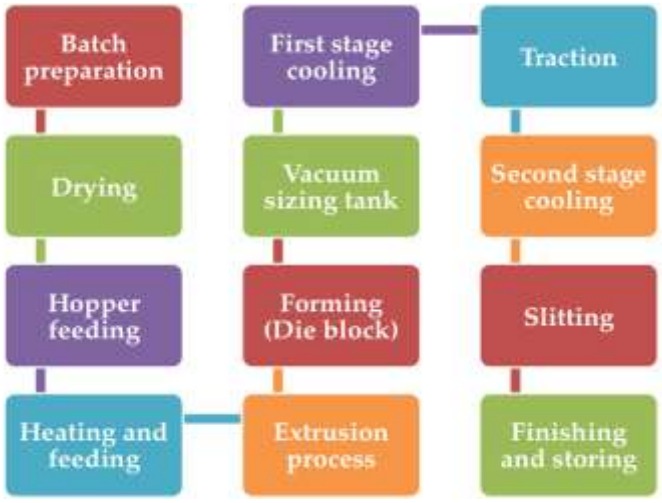


Generic process steps for plastic products

- *Batch preparation:* Depending upon product line, fresh raw material granules, recycled shop floor reject material of similar product, colouring batch master and relevant additives are mixed and appropriately grinded.
- *De-moisturising:* Moisture from the prepared batch is removed in this phase. The final batch composition is transferred either manually or automatically to hopper for next process step.
- *Filtration:* Contamination present if any from the batch composition is removed using both filtering element and demagnetiser. Filtration is also carried out again after melting of the raw material batch before it is fed to screw in the barrel.
- *Melting and heating:* The temperature of dry composition is increased to change the solid phase to liquid phase while it is conveyed through barrel with the help of barrel screw. Temperature of the molten batch is further increased to pre-set temperature with the help of PID based automatic electrical heater, placed on the barrel surface.
- *Forming:* Depending upon the end product, forming is done using in place appropriate shaping mechanism such as moulding, extrusion, blowing, spinning and drawing.
- *Finishing:* This phase includes all operations carried out after forming to final product. It may include stretching, sizing, burr removal, printing and embossing, flattening, lamination, stitching etc.
- *Packaging:* The final marketable products are packed as per marketing and despatch requirement.

Plastic pipe and fitting manufacturing units

The plastic pipes are made in various size and length using extruder. They are quite suitable for various applications like corrosive environment in chemical industries and municipal application (sewage and water piping), electrical conduit, agricultural pipes etc. The primary raw materials used in plastic pipe industries include HDPE and PVC. Appropriate colouring agents are added during batch preparation to produce pipes of different colours. Pipe diameter depends on die block as well as working pressure in vacuum calibration tank installed in the line.



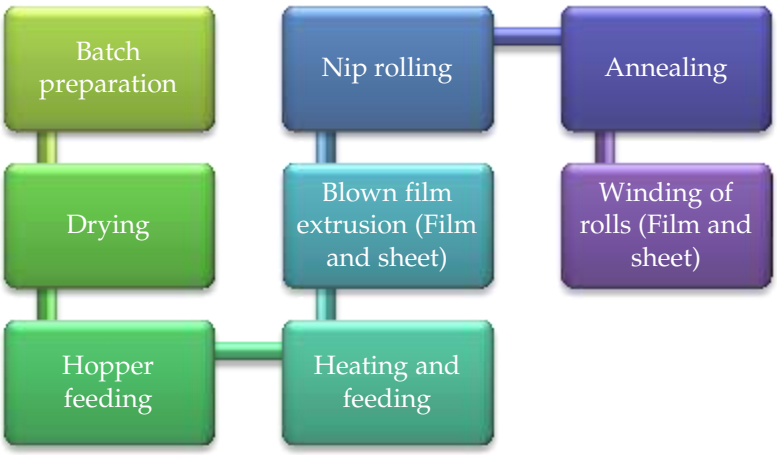
Process flow chart for plastic pipe manufacturing

Plastics pipe extrusion process commonly uses plastic chips or pellets, which are dried to remove moisture and conveyed to a hopper before going to the feed screw for forming in die. After forming, pipes are cooled and strengthen in cooling and traction phases before slitting automatically to a pre-set length with the help of limit switch. A "caterpillar haul-off" (commonly called a "puller") is used to provide tension with consistent pull on the extrusion line which is essential for overall quality of the extrudate. The extrudate like fiber-reinforced tube is pulled through a very long die, in a process called "pultrusion".

Polybags manufacturing units

Packaging and carry bags are made using one of the chemicals - PP, HMHDPE, LLDPE, LDPE, HDPE, BOPP, etc. as base material to suit load carrying capacity and hygiene requirement for a given application. In the blown film process, melted raw material is formed through slit die to form thin walled circular film, which is blown up by air pressure. The pressurized air is supplied in the middle of the die for cooling from outside and inside apart from blown up. The film is flattened while passing through nip rolls and rolled after it passes over idler rollers in the line. It is packed in winding rolls and later cut to pieces as per requirement for target sizes. The process flow chart for blown film is shown in the figure.

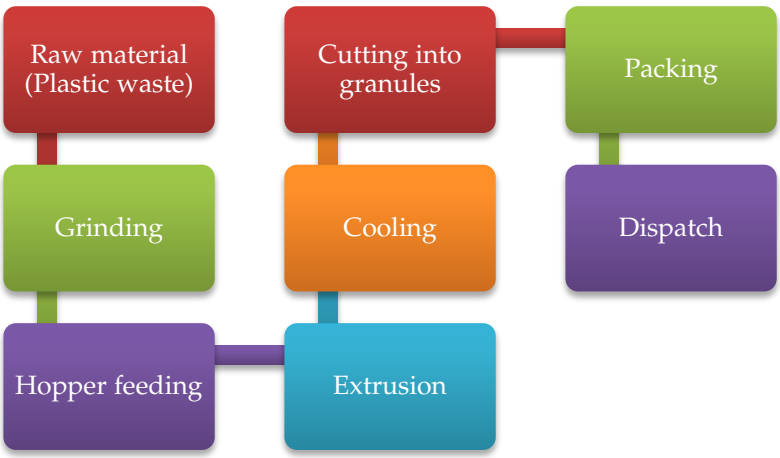
Carry bags



Process flow chart for blown film

Plastic granules

Solid plastic waste is used as a raw material for producing plastic granules. Solid scrap is grinded and put in the hopper and extruded on extrusion machine in the thread form. These threads formed are cooled and then cut into small granules and then packed for dispatch.

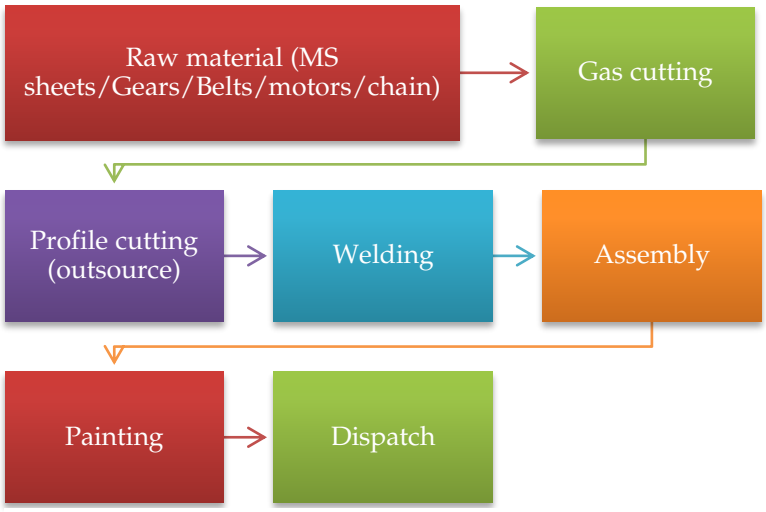


Process flow chart for plastic granules

(ii) Road construction equipment

Manufacturing of road construction equipment follows a generic process of raw material procurement from different suppliers like MS sheet metals and auxiliaries like electric motors which work as a drive train, gears, chains, nut and bolts, etc. MS sheets are cut with gas cutting in required shapes and sizes. Profile cutting is done whenever required. Small parts are welded as per design for the assembly. And after testing and painting, equipment are dispatched. The process flow chart for road construction equipment manufacturing is shown in the figure.

Road construction equipment manufacturing plant



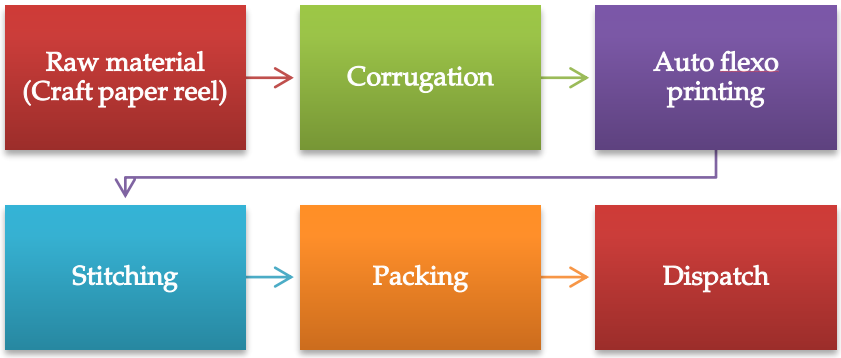
Process flow chart for road construction equipment

(iii) Corrugated boxes

Craft paper reels are the raw material for corrugated boxes. These reels are procured from local supplier and then set on the automatic line for corrugation where it is heated between the drum rolls at around 200-220 ^{o}C using thermic fluid heaters. Simultaneously gum is put between two layers of craft paper sheets. Three/ five ply sheets are processed on the continuous line called as the auto flex line. Corrugated sheets are then stitched on a machine and then sent for a packing and then for a final dispatch. Corrugated boxes are common material for packing purposes. The process flow chart for manufacturing of corrugated boxes is provided in the figure.

Corrugated boxes

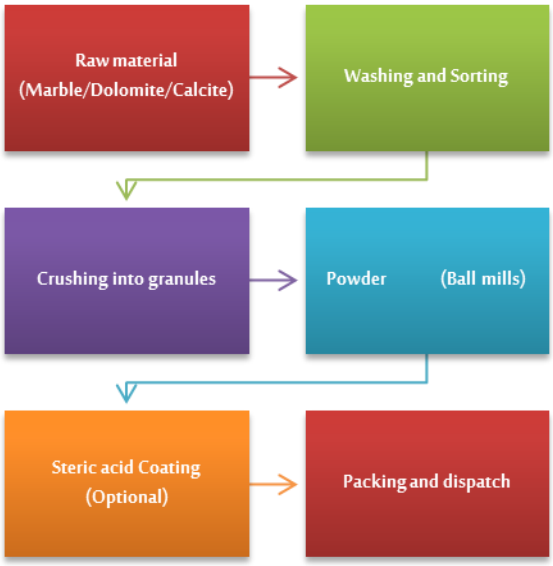
Auto Flex machine for corrugated boxes



Process flow chart for corrugated box manufacturing

(iv) Micron powder

Micron powder is the base material for paints industries. Raw material for manufacturing micron powder is dolomite or calcite in stones or lumps form which are mostly brought from Rajasthan where it is available abundantly. These stones or lumps are sorted based on their whiteness and material properties using screens of different sizes and big stones are crushed to small sized stones. After sorting, stones are washed in rotary washer with water and then transferred for to big silos before grinding process. Stones are transferred to grinding ball mills and grinded to powder form in different sizes of 20/10/15/10 micron size using ball mills. This powder is coated with steric acid to control of properties based on customer requirement. Classifiers are used for the coating purpose which controls the mixing using the preset parameters and then filling the final products in the defined weight bags. These bags are dispatched.



Process flow for micron powder manufacturing

Technologies employed

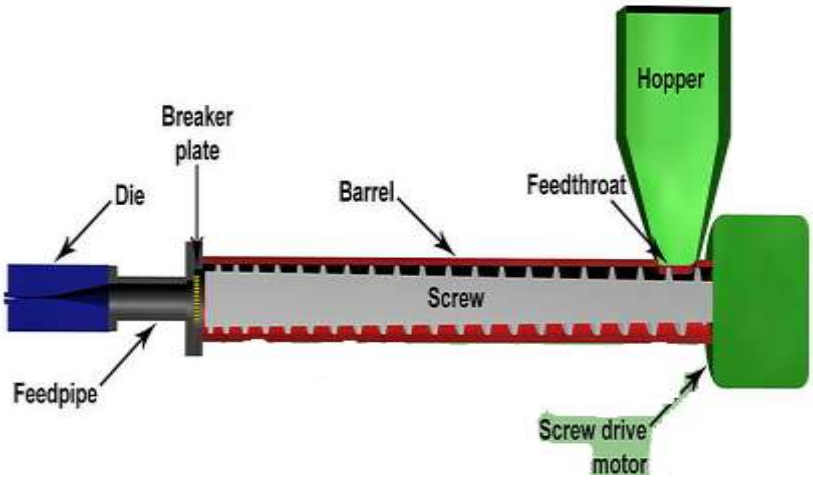
(i) Plastic industries

Plastic industries in the Mehsana cluster use product-based forming technology like extruder, injection mould, blow moulding, along with connected auxiliary equipment as required for smooth operation of these machines. Road construction equipment manufacturers use rather old and traditional technologies for assembly of different parts, most of which is manual. Corrugated boxes units are using auto flex lines which are modern technology along with auxiliaries like steam boiler and air compressors. For micron powder manufacturing cutom made washer machines and sorting machines are employed along

with ball mills and auxiliaries like thermic fluid heaters and air compressors. Some of the primary process technologies are explained below.

Extruders

Extruder primarily consists of two sections such as extrusion and calibration as well as strengthening. Extrusion includes screw, hopper, barrel, heating assembly and forming die. Other section has vacuum calibration tank, quenching, traction or caterpillar haul-off, cutting arrangement with limit switch and belt conveyor. Screw movements effects transport of liquid plastic to dies for extrusion process. The formed plastic cools under blown air or in water bath and hardens on a moving belt. High end advance extrusion machines have built in programmable automatic controlling panel, which is highly efficient. These are used in forming pipes, woven and non-woven sacks as well as blown film.



Schematic view of extruder

Film blowing extruder

It is a special purpose extruder where extruded raw material pass through the specially designed slit die and blown with adequate air pressure to form circular film tube. Later films are passed through nip rollers and followed with annealing before it is rolled after collapsing for downstream processes. Blown film is used to make plastic sheets and bags of different size for diverse applications. A schematic layout of blown film extruder with all connected equipment is shown in the figure.

Blown film for plastic carry bags

Pulveriser and mixer

Pulverisers are used for reuse of waste plastic left from the processes like extrusion and injection moulding. A large number of PVC pipe manufacturers use pulverisers in-house to reuse waste plastic. Pulveriser converts waste plastic into powder form, which is non-virgin form and it is used in mixture with the virgin plastic. Nowadays automatic pulverizes are employed by the industries which have suction blowers and it automatically runs in batch operation. Mixers are used to mix virgin raw material with additives or resins depending on the process. They operate in batches and also remove moisture from raw materials by heat generated due to rotational movement in the mixer barrel. Grinders are used to break big lumps of plastic wastes into small granules, which are then fed to pulveriser.

Pulverizer

Mixer

Grinder

Heating coils

Two types of electrical heating elements for melting and heating are placed over the heating barrel to achieve set temperature with built in control mechanism, either on/off or PID (thyristor based) controller. Most of the conventional electrical heaters are inferiorly insulated resulting higher surface heat loss. One of the energy efficient heating coils is PID controlled barrel band type with better and compact insulation.

Ball mill

(ii) Road construction equipment

Shearing, mechanical press and hydraulic press

SS 202 raw materials like sheet metal, pipes and round bar are sheared in press machine. These presses use motors of 5-10 hp capacity. The SS sheets are sheared as per dimensions in shearing presses. Some of the shearing presses are also hydraulic type its shearing blades are working with hydraulic cylinder strokes. Hydraulic bending machine is used for rolling big MS sheets to required shapes.

Hydraulic press

Welding machines

Most of the road construction equipment manufacturers are using traditional transformer based welding machines for welding process. Transformer machines are slow at starting also draw more current operating inefficiently. Welding is the crucial process at the time of assembly of different parts in construction equipment and more than half of the energy consumption is done by welding machines.

Welding machine

(iii) Corrugated boxes

Auto flex line

Auto flex line consists of automatic deroller along with PID based drum heating system. Craft paper rolls are loaded on the flex line and depending on the process of 3ply or 5ply corrugated sheets requirements, 3 or 4 number of sheets are moved together with steam heating rollers and are applied with glue for putting them together. Flex line is the new automated technology [2]with minimum human interference. Corrugation process is simplified and with utmost accuracy is carried out on flex machines. Once corrugation is done, corrugated sheets are cut in the required sizes.

Automatic plant for corrugated box manufacturing [3]

(iv) Micron powder

Ball mills

Ball mills are commonly used where powder form of raw material is used. Ball mills are generally operated in batch form. Many of the balls mills are run with belt drive and operate on partial loading continuously. Micron powder industry uses ball mills for crushing dolomite and calcite stones to micron powder.

Thermic fluid heater

Thermic fluid heaters (TFH) are used as indirect heating medium in processes wherein controlled heating of the process elements is required. TFHs are used in micron powder industry at the time coating of steric acid to powder process. A process temperature of 90 ºC is maintained. TFH is operated on ON/OFF mode.

Gas fired thermic fluid heaters

2

http://www.challengerpack.com/paper-corrugated-board-and-box-making-machinery/automatic-five-layer-high-speed-corrugated-paper-board-production-line.php

Energy consumption

Electricity is the main source of energy for most of the units in the Mehsana cluster. Almost all the units are dependent on electricity from grid to meet their energy needs. A majority of the units have LT connection and the average connected load is about 100 kVA. Pipe units and micron powder units have HT connection of about 300 kVA or more depending on the plant installed production capacity. The other energy forms used in the cluster include natural gas (NG) and wood. Wood is used in steam boilers, which are primarily used in corrugated box units. NG is used in thermic fluid heaters as a fuel in micron powder units. HSD is used in the DG sets only during power failure, which is not very common in the cluster. Hence the diesel consumption in DG sets is negligible.

(i) Unit level energy consumption

Unit level energy consumption indicates that corrugated boxes units consume more energy than other type of industries. Most of the industries are using electricity as a primary fuel. Corrugated boxes industries consume wood as a primary fuel in steam boilers.

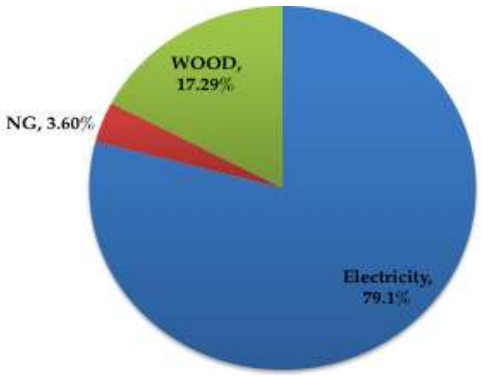
Energy consumption by different types of industries in Mehsana cluster

Type of Industry	Thermal energy (toe/year/unit)	Electrical energy (kWh/year/unit)	Total energy (toe/year/unit)
Microns powder	1.1	13.9	15.1
Road construction equipment	-	2.4	2.4
Plastic carry bag, granules & pipes	-	23.5	23.5
Corrugated boxes	34.6	8.3	42.9

** Energy data collected from individual units in Mehsana*

(ii) Cluster level energy consumption

The total energy consumption of mixed engineering industries of Mehsana cluster is estimated to be 3,400 toe. The break-up of energy consumption of different fuel types at cluster is shown in the table. Electricity accounts for about 79% of total energy consumption followed by wood (17%). The annual energy bill of the cluster is estimated to be Rs 245 million.



Share of energy sources in Mehsana cluster

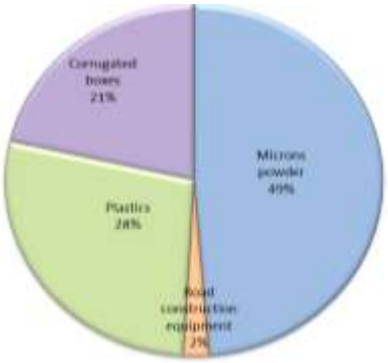
Total energy consumption of Mehsana mixed industries cluster (2016)

Type	Unit	Quantity	Equivalent toe	Share (%)	GHG emissions (t CO_2/yr)	Annual energy bill (million INR)
Electricity	Million kWh	31.3	2690	79.1	30655	237
NG	SCM	144000	122	3.6	252	3.6
Wood	tonne	1680	588	17.3	0	4.6
Total			**3400**	**100.0**	**30907**	**245**

Plastic and corrugated boxes industries in Mehsana contribute around 79% of total energy consumption in the cluster. The contribution of all the industry segments to total energy consumption is also presented in the figure.

Energy consumption profile in the cluster

Type of industry	Energy consumption (toe/year)
Microns powder	1656
Road construction equipment	76
Plastic carry bags, granules & pipes	940
Corrugated boxes	729
Total	3,400



Energy consumption share by different industries

Energy saving opportunities and potential

Some of the major energy-saving opportunities in the engineering units in the cluster are discussed below.

(i) Radiant barrel heater band

Barrel heating is one of the largest energy users at most facilities. Conventionally, it is done with the help of ON-OFF type electrical heating system with improper insulation on its surface. Accuracy of ON-OFF type temperature controller is not very good. Further, improper insulation on the barrel surface results higher heat loss from this surface causing higher power consumption.

Thyristor base temperature controllers with appropriate insulations can reduce power consumption in barrel heating. The latest radiant heater band design is more promising solution. It is easy to install and maintain. The innovative design hastens warm-up times and can make cool-down systems more effective and efficient. Facilities that have incorporated this technology with extrusion machines have seen energy use reduced significantly. Depending on the base case potential energy saving could be in the range of 20–30%.

Potential industries: Plastic industry

(ii) Application of variable speed drives

Motor-driven systems often are oversized and inefficiently controlled. VSDs can provide a more cost-effective method for reducing flow or pressure at the source by varying the speed of the connected load to match the process requirements. Energy savings in VSD applications usually range from 20 - 50 %. Some of the potential applications of VSDs in plastic industry are mentioned below.

Extrusion motor

The barrel screw normally driven through gearbox at constant RPM irrespective of the load on the screw barrel, which is variable at different stages of operation. Hence use of variable frequency drive in place of constant RPM will reduce of power consumption up to 20 %.

Potential industries: Pipe and pipe fittings industry

Thermic fluid pump motor

Thermic fluid heater in micron powder units coupled with two way valves can optimise the efficiency of heating system by controlling the flow of thermic fluid based on temperature control. Flow of thermic fluid can be varies using VFD drives which can result into significant energy savings.

Potential industries: Micron powder industry

Ball mills motor

Steel ball mills in micron powder mills can be retrofitted with VFD drive. Ball mills operate on batch mode and batch duration and weight varies hence VFD can save energy as well as lower the demand of the plant by smooth starting of the motor by reducing the starting current.

Potential industries: Micron powder industry

Cranes and hoist motors

Cranes and hoists are widely used in all the industry to enable movement of heavy parts and components. Cranes and hoists have two motors for horizontal and vertical movement with rating of 7.5 hp to 75 hp depending on crane capacity. As these motors go under frequent on/off cyclea long with jerk loading, application of Variable Frequency Drive (VFD) in crane operation may lead to an energy saving of about 15%. VFDs will also facilitate soft starting thereby avoiding jerk starts, which will further help in increasing motor life.

VFD for cranes and hoist motors

Potential industries: Road construction equipment industry, plastic industry, micron powder industry and corrugated boxes industry

(iii) Optimization of process cooling circuit

This includes the staging of chillers, reducing condenser water temperature, and improving pumping efficiency through the use of VFDs and controls. Depending on the required process temperature and application, some of the chilled water demand can be eliminated by using dry coolers or cooling towers in place of chillers. Very often the pumps used in cooling tower system are inefficient and selection is not done on technical basis. This results in higher power consumption. The inefficient pumps may be replaced with energy efficient pumps. Optimizing process cooling can reduce cooling costs by 10 to 25 % annually.
Potential industries: Plastic industry

(iv) Compressed air

Savings of more than 15-25 percent can be realized through improving the supply and reducing demand in compressed air systems. Opportunities can be found in the supply side

by installing new or optimizing existing equipment and reducing the system pressure. Demand can be reduced through improving end uses and repairing leaks. Some of the potential areas of compressor system with specific options are mentioned below

Replacement of reciprocating air compressors with energy efficient VFD screw air compressors with permanent magnet synchronous motor

Reciprocating air compressors have high specific power consumption along with high maintenance, noise levels and vibration. Screw air compressors have low specific energy consumption due higher CFM output per kW power consumption. Also, new age screw air compressors with permanent magnet synchronous motor coupled to speed drive can give as much as 50% energy savings with payback period below 8 months to 1.5 year depending on the operating hours and size.

Potential industries: Micron power industry, plastic industry, corrugated boxes industry

Retrofitting air compressor with variable frequency drive

Reciprocating compressor (smaller units)

Screw compressor with VFD (larger units)

During normal operation, screw air compressor operated on unloading position for more than half the time. Installation of variable frequency drive (VFD) to such compressors will minimise the unload power consumption.

Arresting the compressed air leakage

Compressed air is an expensive utility in a plant. However, in most cases, air leakages in piping system are quite high (more than 20%) and go unnoticed. The compressed air leakage can be reduced to about 5% with better operating practices. Plant can reduce significant energy consumption by controlling compressed air leakages with no or minimum investment.

Reduction in pressure setting of air compressor

The pressure setting of air compressors are often much higher than the actual air pressure requirement at the point of use in the plant. The typical unload and load pressure settings are 8.5 and 7.5 bar respectively. Reducing the compressed air pressure as per end-use requirements will result in high energy savings. Reduction of generation pressure by one bar can lead to energy saving of 6%.

(v) Replacement of rewound motors with energy efficient motors

Rewinding of motors result in a drop in efficiency by 3-5%. It is better to replace all old motors which have undergone rewinding three times or more. The old rewound motors may be replaced with EE motors (IE3 efficiency class). This would results into significant energy savings with simple payback period of 2 to 3 years.

Potential industries: (i) Road construction equipment industry (ii) plastic industry (iii) micron powder industry (iv) Corrugated boxes industry

(vi)Replacement of old centrifugal and submersible pumps with horizontal multistage mono-block pumps

Old single stage pumps consume more power due bigger motor size with reference to its flow and pressure output; these pumps can be replaced with energy efficient horizontal multistage monoblock pumps, which can give 30 to 50% energy savings with immediate payback period. Many plastic industries use submersible pumps, which do not have long life, hence submersible pumps can also be replaced by multistage monoblock pumps.
Potential industries: Plastic industry

(vii) Replacement of wood fired boilers with Coil type steam boilers

Corrugated box industries generally use wood fired boiler, which is though economic but inefficient in operation and requires heavy maintenance and manpower for material handling. Replacing the wood fired boiler with energy efficient gas fired coil type boiler can save manpower for material handling as well as maintenance cost. Wood fired boilers mostly operate on partial load with low efficiency hence coil type boiler of lower rating can satisfy the need of steam with high efficiency and less cost.

Potential industries: Micron powder industry, corrugated boxes industry

(viii) Replacement of transformer based welding machines with inverter based welding machines

IE1 & IE2 motors

IE3 motor

Inverter based power sources allow delivering of more power output from new power electronics technology, resulting in a better performance-to-size ratio. These models also deliver smooth operation with greater efficiency than many older, conventional welding power sources. Old transformer rectifier based welding machines have efficiency of 67% while inverter based machines can perform with 87% efficiency with better power factor. Inverter based welding power sources offer following advantages:

- Lightweight and portable
- Able to obtain superior stick welding performance with all electrode types
- Multi process welding output without sacrificing arc performance in any mode
- Quick response to changing arc conditions (e.g. maintains steady weld output)
- Superior control over pulsed welding processes
- Line voltage independent - uses single or three phase input power and multiple input voltages without any manual relinking mechanism
- Better power factor (more efficient use of power from the utility)
- Less susceptibility to primary voltage fluctuations

Inverter type welding machine

Potential industries: Road construction equipment industry

(ix) Energy efficient lighting

T-12 tube lights (of 52W including choke) and halogen lamps (150W and 250W) are generally used by units in the cluster. These inefficient lightings can be replaced with energy efficient LED lighting (LED tube lights of 10W and 20W) and flood lamps and high bay lamps (20W, 40W and 80 W) which would provide better illumination and energy savings. Since a large number of lamps are used in the units, the existing lighting may be replaced with EE lighting in a phased manner

Potential industries: All types of industries

Major stakeholders

The primary stakeholders in the cluster are the engineering units based in Mehsana and the leading industry association of the region –Dediyasan Industrial Estate Association (DIEA). District Industries Centre (DIC), MSME DI, SIDBI, various government agencies, regulatory bodies, research and academic institutions, testing and training institutes and BDS providers. These cluster actors provide various services to the cluster units, such as training of workers, testing facilities, financial services, technical know-how, regulatory and advisory services, raw materials supply, supply of technologies etc.

Out of these stakeholders, DIEA is the most proactive in the region. It has members from all over the Mehsana district as well as other parts of North Gujarat region. It has more than 450 members. DIEA frequently holds meetings for business development for its members which addresses other activities like raw material quality assurance, technology interventions, etc. DIEA also holds exhibit displaying products manufactured by its members in different parts of North Gujarat as well as National level exhibits.

Cluster development activities

There are no specific cluster development activities in Mehsana cluster specific to engineering industries.

About TERI

A dynamic and flexible not-for-profit organization with a global vision and a local focus, TERI (The Energy and Resources Institute) is deeply committed to every aspect of sustainable development. From providing environment-friendly solutions to rural energy problems to tackling issues of global climate change across many continents and advancing solutions to growing urban transport and air pollution problems, TERI's activities range from formulating local and national level strategies to suggesting global solutions to critical energy and environmental issues. The Industrial Energy Efficiency Division of TERI works closely with both large industries and energy intensive Micro Small and Medium Enterprises (MSMEs) to improve their energy and environmental performance.

About SDC

SDC (Swiss Agency for Development and Cooperation) has been working in India since 1961. In 1991, SDC established a Global Environment Programme to support developing countries in implementing measures aimed at protecting the global environment. In pursuance of this goal, SDC India, in collaboration with Indian institutions such as TERI, conducted a study of the small-scale industry sector in India to identify areas in which to introduce technologies that would yield greater energy savings and reduce greenhouse gas emissions. SDC strives to find ways by which the MSME sector can meet the challenges of the new era by means of improved technology, increased productivity and competitiveness, and measures aimed at improving the socio-economic conditions of the workforce.

About SAMEEEKSHA

SAMEEEKSHA (Small and Medium Enterprises: Energy Efficiency Knowledge Sharing) is a collaborative platform set up with the aim of pooling knowledge and synergizing the efforts of various organizations and institutions - Indian and international, public and private - that are working towards the development of the MSME sector in India through the promotion and adoption of clean, energy-efficient technologies and practices. The key partners are of SAMEEEKSHA platform are (1) SDC (2) Bureau of Energy Efficiency (BEE) (3) Ministry of MSME, Government of India and (4) TERI.

As part of its activities, SAMEEEKSHA collates energy consumption and related information from various energy intensive MSME sub-sectors in India. For further details about SAMEEEKSHA, visit http://www.sameeeksha.org