









# "PROMOTING ENERGY EFFICIENCY AND RENEWABLE ENERGY IN SELECTED MSME CLUSTERS IN INDIA"

To develop and promote a market environment for introducing energy efficiency and enhanced use of renewable energy technologies in process applications in the selected energy-intensive MSME clusters, United Nations Industrial Development Organization (UNIDO) in collaboration with Bureau of Energy Efficiency (BEE) is implementing a project titled "Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India" funded by Global Environment Facility (GEF) and co-financed by Ministry of Micro, Small and Medium Enterprises (MoMSME) and Ministry of New and Renewable Energy (MNRE).

# Installation of a screw compressor with in-build VFD in ceramic glazing unit

# **Objective**

To minimize the energy consumption in the compressed air system by avoiding unloading of the compressor.

### Implementation

Installed a screw compressor with inbuild VFD in place of existing reciprocating compressor to reduce energy consumption.

# Principle

The screw compressor is generally not equipped with valves and has no mechanical forces that cause unbalance. So, it can work at a high shaft speed and can combine a large flow rate with small exterior dimensions. VFD installed screw compressors can speedup and slowdown in response to load. They are the best choice for efficiency when a compressed air load varies throughout the day.

- Offers a constant air flow at all times and guarantees a uniform pressure through out
- Improves the life of the compressor by limiting functioning time
- Reduces the electrical consumption of the compressor system.

VFD air compressors can reduce the energy consumption by 10 - 40% compared to modulating compressors.



Confederation of Indian Industry



# Unit Profile

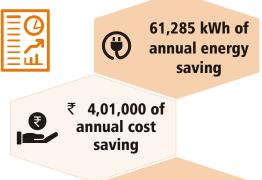
Champion Ceramic is a ceramic industry located in Thangadh. The capacity of the unit is 3600 MT of sanitary ware per year.

### **Benefits**

- Improved life of the machinery & process output by maintaining constant header pressure
- > Constant airflow at uniform pressure
- Reduced leakages
- Reduction in specific energy consumption in the compressed air system.



### **Outcomes**



50.2 T of CO<sub>2</sub> reduction per year (0.82 kg/kWh)

## **Replication Potential**

In all the units with transformers on No-load

### **Cost Economics**

Input motor power	28 kWh
Specific Power Consumption ( kW/m³/min)	9.19
Proposed power consumption (kW/m³/min)	6
Reduction of power consumption	18 kWh
Reduction in annual energy consumption	61,285 kWh
Annual cost savings	₹ 4,01,000
Installation cost of new screw compressor with VFD	₹ 9,80,000
Simple payback period	30 months

### Calculation

Energy savings per annum (kWh/year) = (Energy consumption before implementationafter implementation, kWh/month) \* 12

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#### Unit

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