

Maximizing energy efficiency with extruders

Extrusion

Screw rotating extruders are widely used in the plastics industry but are also operating in other industries such as rubber, food, feed and powder coating, etc.

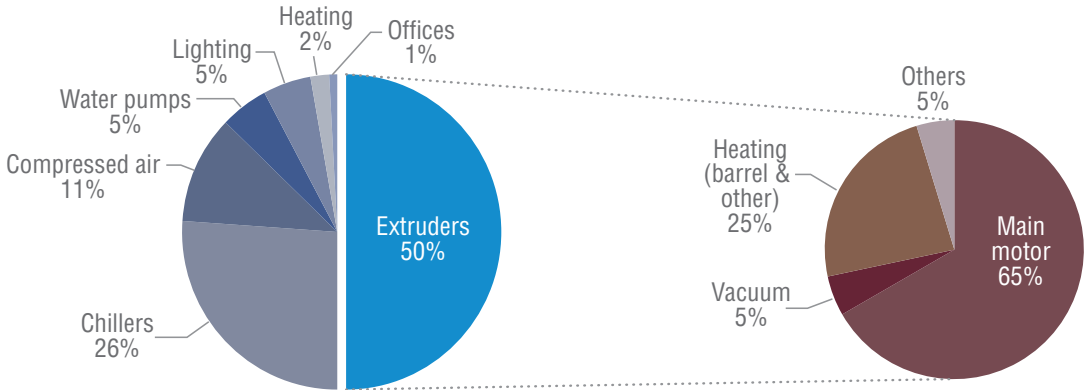
The plastics industry is highly dependent on competitive energy and raw materials. In Europe, the plastics industry calls policy-makers to joint action for sustainable growth, one of the first recommendations has been to ensure more competitive energy costs.

About 50% of plastic volume is transformed by extrusion. In a typical extrusion operation, about **1/3 of energy consumption** is related to the motors.

Historically, DC technology was mainly used for variable speed performance but the latest progress in AC control led to a technology shift. Efficiency is now an important consideration and recent energy savings policies encourage DC to AC system conversion on existing extruders. Such retrofit also significantly reduces maintenance costs.

Energy operators generally penalize manufacturing sites with low power factors, end-users may have no options other than paying significant penalties or modifying their installations with costly capacitor banks.

Induction and permanent magnet solutions result in a high power-factor compared to DC systems.



Energy distribution across a typical extrusion site



Case study: manufacturer of plastic film for the packaging industry

Stretch film products are made by a cast extrusion process. With over 150 extruders operating in 5 strategically located manufacturing facilities, the company is a leading supplier for the retail and distribution plastic bag market. The company's goal is to reduce greenhouse gas emissions more than 3% per year. It has been an Environmental Protection Agency Energy Star partner since 2008.

Challenge

The manufacturer identified extruder motors as major consumers of power and engaged in an energy savings action plan. After conducting benchmark tests on the different options available, the company decided to switch existing units from DC to AC permanent magnet technology and to implement this high efficiency solution on new units.



Former installation

50 x DC motors & drives, from 15 to 400HP. Units were run continuously 24/7. An extruder not being dedicated to the manufacturing of a single type of product, motors are used in a combination of loads and speeds (generally from 40% to 90% of nominal values).

Our solution

50 x Dyneo® solutions, consisting of 1,800rpm LSRPM IP55 motors + Unidrive M inverters, offering top efficiency performances all over the load/speed ranges. This AC variable speed solution also permitted reactive power savings resulting in a reduction in penalties from the energy supplier.

Benefits

The energy savings are estimated at 2,300,000 kWh/year, which is about 185,000 USD/year. In addition, the manufacturer realized significant maintenance savings, leading to a return on investment of less than 12 months.