In 1997 OCMI and its partner MT Forni Industriali, set up a new group able to supply a wide range of equipment for the hollow glass industry, as well as turnkey plants in this same sector under the AMIG trademark. Some of these plants, examples of really prestigious achievements, are for the production of insulators for high voltage overhead lines.

**GLASS INSULATORS**

Due to the final use of the articles to be produced, this type...
The production process requires maximum attention to all details, starting from the quality of raw materials, percentage of each component in the glass composition, glass temperature in each and every point of the processing line, up to storage method and time.

In fact, glass insulators are exposed to all possible temperatures, environments, temperature gradients, meteoric precipitation, and require extremely high resistance to both mechanical and thermal stresses.

This is the reason why the production process does not terminate with the packing of the products, and sophisticated control machines and tests are required before including the item in the final supply.

Furthermore, manufacturing is not limited to glass processing but also includes the preparation, control and assembly of cement caps and pins needed to realize the insulator chain for high voltage overhead lines.

Moreover, this additional material must be stored, prepared and processed in the correct way in order to conform to international standards required.

**RELIABLE PARTNER**

OCMI and MT Forni can, together, be considered a reliable partner in these kinds of projects thanks to their long experience coming from numerous installations realized in the most important glass insulator factories worldwide, and particularly in Algeria, Iran, China and Italy.

At present, the market is covered by a small number of large manufacturers, but some new projects are under analysis mainly in countries with great availability of raw materials and where, with favourable incentives, governments are pushing the electrification of territories, not only those near important inhabited areas.

The AMIG trademark, together with OCMi’s glass forming know-how and MT Forni’s in-depth knowledge about glass melting and thermal treatment, allows the Group to supply the following equipment:

**For glass shell production:**
- melting of a batch of suitable composition;
- forming by a special press;
- temperature homogenising;
- toughening;
- thermal, mechanical and dimensional tests.

**For insulator production:**
- assembly with cement and metal fittings;
- routine thermal, mechanical and dimensional tests.

**For insulator certification:**
- type tests and sample tests in accordance with International Standards.

**BATCH PLANTS, MELTING AND GLASS PREPARATION**

For batch plants, melting and glass preparation, the quality of raw materials is of primary importance and has an important effect on the quality of the finished products.

Both gas-fired and electrical melting furnaces can be supplied by AMIG according to the power cost conditions of each country.

On the other hand, AMIG focuses very carefully on the control of the melted glass temperature and the viscosity of glass gob.

The glass gob must arrive in the press loading station with the best viscosity conditions. AMIG press machines are available in different models according to the volumes of glass insulators to be produced. AMIG’s gob loading system is direct from the electronic feeder without a delivery spout in order to prevent contamination to the gob.

Fire-polishing of the glass gob is carried out by means of special burners mounted under the feeder and on the press machine after gob loading.

Hydraulic or electric pressing operations are carried out...
by a rotating multiple plunger that prevents the overheating of the plunger itself and facilitates water-cooling. Feedback regarding gob weight can be sent through sensor signals from the pressing plunger to the feeder in order to reduce weight variation between strokes.

This multiple plunger is lubricated automatically with acetylene, while the press table, moulds and moulds holders are equipped with their own cooling system.

Take-out of the pressing, homogenising and toughening machines is usually carried out by means of anthropomorphic robots with special grippers developed according to the insulator type.

The thermal treatment line starts with a linear temperature homogenizing machine with several independent heating zones, usually gas fired, and a special combustion system with dedicated burners.

The rotation toughening machine by AMIG, operating with compressed air for upper and lower cooling of the glass shells, considerably decreases the temperature of the product. This cooling must be carried out with the correct air pressure in order to make toughening more effective and carry out a first selection of the best glass shells by means of the breakage of the weakest insulators.

All toughened glass shells are then processed according to IEC standard regarding thermal shock. This line is able to perform the test on all types of toughened glass shells for insulators according with the specifications described in the IEC 60383.

After toughening, the glass shells are cooled down and then move to the up shock section, to support a ΔT>370°C. After up shock, the glass shells are cooled again and conditioned in a second section, before entering a water pool, to support a negative ΔT>150°C.

The glass shells are then collected from the pool for final visual check.

**ADDITIONAL THERMAL TREATMENT**

AMIG also offers additional thermal treatment to improve the quality of the finished insulators to be stored, such as the NiS lehr for the thermal treatment of the nickel sulphide crystals inside glass and force spontaneous breakages.

OCMI and MT Forni are able to supply the engineering know-how and equipment for the development of assembly departments and test laboratories.

The AMIG insulator line is developed with great attention in details with the primary purpose of maximizing the efficiency of the line.

This is made possible thanks to skilled AMIG glass experts with specific knowledge in these high-tech products.