New State-Of-The Art Mini-Wiremill

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Decades of experience and unique technical concepts are evident in this new wire-making facility that will double as a training facility for wire drawing, bunching and quality control.

Fig. 1—FILOWIRE plant.

Our article "New Technology Concept" about a new multi-wire drawing machine, annealers, spoolers and payoffs for building wire applications appeared in the May 2005 issue of *Wire and Cable Technology International* magazine. Now, two years of hard work by **GBC Technologies, Inc.** and **Sictra Srl** have materialized in a new state-of-the-art mini-wiremill.

In mid 2005, GBC expanded by adding an approximately 20,000 ft^2 (1860 m^2) building. It became a new home for very modern and unique wire drawing, annealing and spooling equipment as well as payoffs and accessories, all fabricated by GBC and Sictra. The wiremill was designed for the production of high-quality, close-tolerance bunched product, mainly for use in the energy industry. See **Figure 1**.

This new family-owned facility was named **FILOWIRE**, which in English, translates to WIREWIRE, Filo means wire in Italian which connects the Italian origin of the Sictra equipment with the GBC products made in the USA.

The new wiremill is a show room of well known Sictra wire drawing equipment. GBC is the Sictra agent for the North American continent. Customers can visit GBC to actually see the equipment and accessories in production.

Rod Breakdown—Multiwire—Bunching

The wiremill is vertically integrated from bunching equipment to a rod breakdown line and consists mainly of the following equipment:

- Sictra 10-die tandem rod breakdown line with a large coiler for the production of high quality redraw hard wire (12 to 13 AWG or about 2.0 mm) packaged in baskets up to approximately 7000 lb (3175 kg) capacity. This line also features a unique, newly designed automatic rod payoff system. The machine model is SBS 10T/450 with coiler model MAV 1000. It features quick change, large 450 mm (17.7") capstans, double-die pressurized lubrication, and the machine drawing section is fully emerged by emulsion. See **Figure 2**.
- Sictra eight-wire multiwire drawing line, model number TFC 7T/20-120/19-7L with a model RCO 250/7-1700 annealer and spooler model BOV 80, consisting of a multi-wire in tandem with a unique, newly developed, horizontal annealer and a unique vertical dynamic automatic spooler for 800 mm (31.5") reels. This multiwire line can produce medium and coarse wire size up to eight wires, but it is mainly used to produce seven wires, used as core wires

Fig. 2—Sictra tandem rod breakdown line.

Fig. 3—Sictra eight-wire multiwire line.

Fig. 4—Sictra vertical dynamic automatic spooler BOV 80.

or composite wires for bunching applications. The wire is packaged in 800 mm (31.5") DIN reels positioned vertically. The reel is positioned in the same configuration of a static spooler, but it spins dynamically, not stationary as is the case in a static spooler. The multiwire drawing section features quick-change, direct coupling motor (no belting) and improved, massive emulsion flow with a separate emulsion line for the final die. The annealer was designed horizontally. It is an amazingly easy machine to string-up and work on for the production and maintenance personnel. The design of this annealer was inspired by a request of **Encore Wire Corp.**, in McKinney, TX, USA. Cooling of the wire turned out to be much better in the horizontal mode. The annealer also features very effective triple-wire wipers for production of very dry wire. The spooler is a completely new design—it is actually a dynamic spooler, but in vertical mode. From the outside, this spooler looks similar to a static spooler, but the reel is spinning instead of the bell rotating. The wire does not drag on ceramic rings—instead, the wire travels to the old-fashioned, ceramic-coated large root pulley. The reel will stay in a vertical mode through all of the processes from spooler to buncher and back. The spooler features a conveyor for three reels (standard) or an endless conveyor (optional), taping device and an automatic traverse. This spooler is very simple and friendly for the operator and maintenance personnel. See **Figure 3** and **Figure 4** inset.

- 16-wire, Sictra model TFC 16T/20-120/19-8.2 muli-wire line, in tandem with a conventional vertical annealer model RC 250/16-1700 and two vertically dynamic spoolers model BOV 80, is mainly for the production of the seven and six-wire outer layer of a bunched product. The multiwire can produce up to 16 wires suitable for various applications such as energy, automotive and appliance wires.

- Sictra model TFC 40-140/17S-C intermediate drawing line, in tandem with a vertical dynamic spooler model BOV 80, annealer model RC40-140/1700 and a mini-rod breakdown line. This line can produce single-end wire directly from 5/16" (8 mm) copper rod in one step. The machine's top speed is approximately 7500 fpm (38 mps). It is equipped with a powerful annealer to produce coarse wire at a high production rate. See **Figure 5**.

Fig. 5—Sictra intermediate drawing line in tandem with a mini-rod breakdown line.

- Bunching is achieved by a combination of new and used, but updated/overhauled bunchers from several vendors. The payoff systems for these bunchers are very innovative. Payoff is achieved by the use of newly developed, vertically dynamic payoff systems with automatic tension control. The combination of dynamic vertical spooler on the multiwire line and dynamic vertical payoffs at the buncher with automatic tension control achieve the production of high-tolerance and high-quality bunched product with minimal floor space usage and minimized material handling. Wire separation is extremely easy. This dynamic payoff allows production of very high-tolerance product, mainly because the desired tension is continuously constant from full to empty reels. These payoffs are modular and can be ganged together with minimal floor space usage. Removal of the reel is extremely easy for this vertical payoff: simply lift the reel and lower it to the rotating table using the appropriate tooling (no pintels, lifting device, driving pins, etc.). There is no need for the operator to manually move the reels on the floor. See **Figure 6** on the next page.

- The emulsion systems, coolant system and other process equipment supporting the wire-making facility are also state-of-the-art with improved filtration. See **Figure 7** on the next page. All running parameters of the wire-making equipment and auxiliary items are controlled and supervised by a host computer.

Almost three decades of GBC experience was applied

Fig. 6—Buncher payoffs with automatic tension control.

to the design of this new wiremill. The construction project from laying the footer to completion took approximately six months. The project was completed in January 2006, and after almost six months of production, the results are impressive. High-efficiency, high quality product and a low scrap rate resultis in lower production costs.

Fig. 7—Emulsion filtration.

Next Step

We are preparing the wiremill to become a training facility with regular courses on wire drawing, bunching and quality control for a wide variety of personnel.

The new facility doors are open to our dedicated customers and new potential customers seeking modern state-of-the-art equipment, technology and know-how.

For more information, contact the authors or **Circle 212.**

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Company Profiles...

*Established in 1970, **Sictra Srl** has a long tradition and experience in the manufacture of wire drawing equipment for copper and aluminum. The company offers twin and single tandem rod breakdown machines with dual drive and microprocessor, semi-tandem rod breakdown machines, twin and single intermediate wire drawing lines, twin and single fine wire drawing lines, multi-wire drawing machines with modular systems available from four to 28 wires, wire drawing units for tandem telephone lines, a variety of spoolers and coilers and custom wire drawing equipment designed and built to customer specifications.*

***GBC Technologies, Inc.**, founded in the mid-1980s, supplies a full spectrum of high-tech services and equipment for the wire and cable industry, from a basic piece of equipment to a full turnkey facility for modern production of copper wire and other conductors. In 2003, GBC also expanded capacity by joining forces with and becoming an agent for some of the major well-known producers of specialty wire drawing equipment and accessories including Sictra.*