CAVEL - a European product made in Italy

A little of our history

(as illustrated by some of our past CAVEL catalog covers)

1968

Italiana Conduttori Srl has been successfully producing CAVEL coaxial cables since 1968. At that time, the only channel broadcast in Italy was the **first channel, RAI 1. The newly established company was practically little more than a laboratory in Pavia,** and initial production still included the *300 Ohm flat twin-lead*, with tinned copper conductors, and some *60 and 75 Ohm coaxial cables*, **used for the reception of VHF signals, i.e., for frequencies in the range of 400** MHz.

The 1970s.

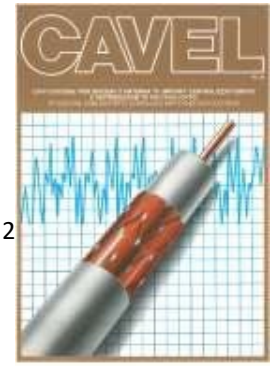
RAI began broadcasting its second TV channel in the **UHF band, with signals up to 862 MHz, and the company began to** grow by focusing on the production of 75 Ohm coaxial cables, which continued to be the **leading product throughout the 1970s.**

All those coaxial cables had a *single shield*, made of a braid of copper wires (fig. 1); in **cheaper models, the braid was in bare copper wire, in others in tinned copper, and in the most "effective" models, in silver-plated copper wires** (fig. 2). In addition, the market mainly demanded coaxial cables with *solid PE dielectric* (fig. 3).

As early as the late 1970s, some coaxial cables were provided with a *second shield*. Initially, this was a laminated aluminum/polyester (Al/Pet) foil placed between the braid and the sheath to improve the **cable's immunity from electromagnetic interference.**

The September 1978 publication, in the form of a pocket-sized handbook of Application Notes on Centralized Systems, already described the qualities that these improvements provided (fig. 5).

Figures 1 and 2



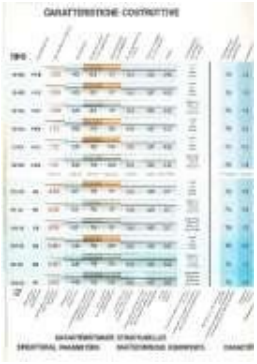
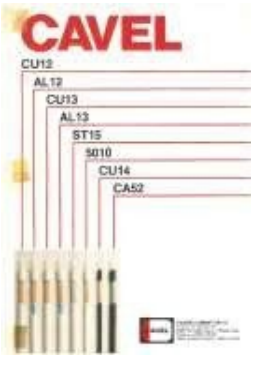
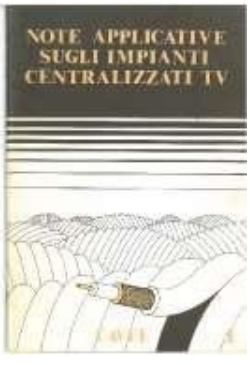


Fig. 3, 4, 5





The 1980s

The 1980s saw the emergence and subsequent broadcast of satellite reception throughout Europe while private TV networks began to proliferate in Italy (fig. 6).

All cables were systematically modified to meet the growing demand for lower losses and better shielding efficiency. The Linear Attenuation of coaxial cables was improved by massively introducing the use of *foam dielectrics*, which, compared to solid dielectrics, allows a higher propagation speed of electromagnetic waves; at that time, foam dielectrics were made by mixing low-density polyethylene (LDPE) *with chemicals* called "foaming" as they develop gases with the heat and pressure generated by the extrusion process.

On the loss side, on the other hand, research conducted to further improve Shielding Efficiency necessitated the extensive use of *double shielding* of coaxial cables. During this industrialization of the double shielding process extended to large quantities of coaxial cables, the application of shielding foils migrated between dielectric and braid, while the simple Al/Pet foil was soon joined by the more effective Al/Pet/Al combination, both combined with tinned copper wire braids. In some countries such as Spain and Great Britain, however, the most popular combination was foil and bare copper wires.

All these improvements were initially developed in close cooperation with some of the European leaders in the television industry, such as: WISI in Germany, Televes in Spain, and DKT-Comega in the Scandinavian countries, just to mention some of the major clients of those years. Thus, little by little the entire production of qualified coaxial TV cables was made exclusively with double-shielded cables.

The second publication of a "Handbook for the Installation of Centralized TV Systems" (fig. 7) dealt with these innovations, while another publication "Coaxial Cables ... and Us" extensively recounted the application of technological knowledge to the production processes put in place in those years by our company (fig. 8).

Figs. 6, 7

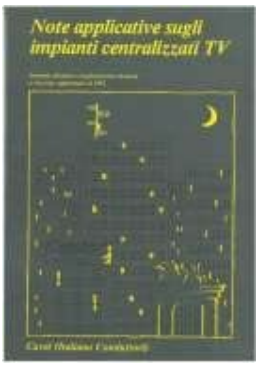
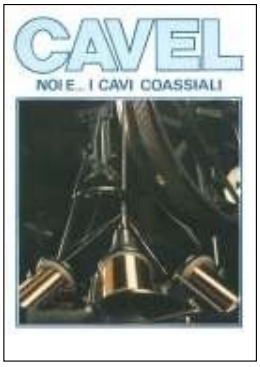


Fig. 8



The strategic improvement in the quality of CAVEL products and effective customer service made Italiana Conduttori the leading company in the Italian market in the 1980s, while the growing export business focused on all European countries, including those in Eastern Europe such as Yugoslavia, Bulgaria, and the Czech Republic. Some examples of this internationalization can be seen on the covers of some catalogs dedicated to major European clients such as:
Maxview in Great Britain, with a line of cables with "air-spaced" dielectric (fig. 9); Dansk Kabel in Denmark, with the first line of TV cables for burial (fig. 10).

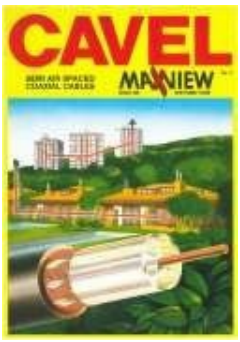
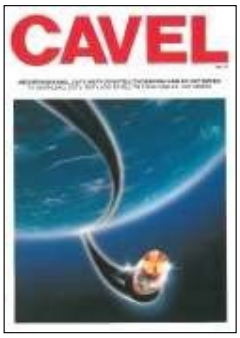


Fig. 9 and 10



Nevertheless, by the end of the 1980s, CAVEL's exports reached: the Middle East, namely Egypt, Turkey and Saudi Arabia, and even East Asia countries such as Hong Kong and indirectly China.

1988

At our plant, a bare *copper wire drawing* facility has been in place since 1988 and subsequently implemented. This activity was conceived solely with the intent of controlling and improving the quality of one of the most important components of all data transmission cables, whether coaxial or twisted-pair: the inner conductor.

Gradually, this activity continued to grow to its present capacity to make the entire supply of inner conductor wires needed for our production; something in excess of 500 tons of drawn copper wire per year. We can process wires in the diameter range from 0.31 to 3.40 mm.

During the process, wires are checked according to: diameter, tensile strength, elongation, eccentricity, and surface cleanliness; all equally important parameters especially for making wires for electromagnetic signal transmission cables, due to the "skin effect" of high frequency.

The 1990s

During the first half of the 1990s CAVEL's Technical and *Quality Control* Department was developed, both with regard to technical skills and by upgrading measuring equipment and extending qualification and control methods to all raw and semi-finished materials. With these, the company developed further improvements on the product which we will outline below.

At the *EDP system* level, the company also improved its organization, installing a comprehensive computer system for state-of-the-art administrative, commercial, logistical as well as technical and operational management.

1993

The leadership established in the Italian market was coupled with an expanding sales network and a larger number of sales agencies, flanked by a group of capable technical promoters dedicated to assisting end clients; their experience and technical and application knowledge were

systematically passed on to many installers and designers through a large number of *seminars* held in many Italian cities.

To further support these activities, the technical publication "User Manual for TV Coaxial Cables" was updated, which soon became a popular guide among operators in our field (fig. 11).

Fig. 11

1995

For the first time, by the end of 1995, annual sales and production exceeded *100,000 km of cables*. This achievement was partially also due to a new strategic vision of the company management, namely to concentrate efforts in further promotion and consolidation of its CAVEL brand, especially in foreign markets, instead of perpetuating more constraining productions dedicated to the OEM market.

Indeed, it was no accident that in that very year, the company began supplies to Russia, with the help of the exclusive distributor for that country, the LANS Corporation of St. Petersburg. This was a welcome opportunity for both companies, which from then on began to grow together, both clearly mutually satisfied with the results, as we can see from the large number of editions of CAVEL catalogs in Russian, shown below (figs. 12-15).

Fig. 12

Fig. 13

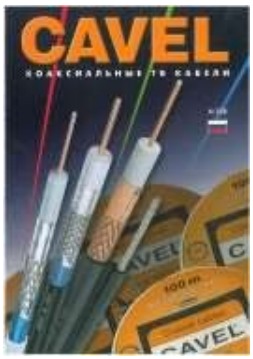


Fig. 14

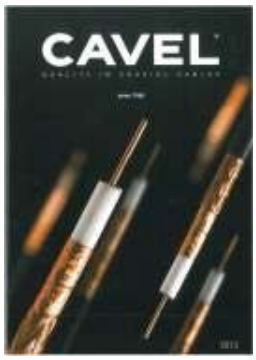


Fig. 15

1996

In 1996, CAVEL began to introduce the innovation of gas (nitrogen) injected foam extrusion dielectrics. This new technology had been introduced first in Europe by the Dutch company Pope, as it had recently come under the ownership of the US-based Belden. Our company was the second in Europe to develop the physical extrusion of foam dielectrics, and from the beginning we adopted its most sophisticated form, the so-called "skin-foam-skin" technology (figs. 16, 17).

This step represented a further major improvement in the quality of CAVEL cables, specifically with regard to the mechanical strength of the cables and their ability to maintain their electrical characteristics unchanged for a long time, one of the pillars on which the typical 15-year warranty of our products is based (figs. 18, 19).

Moreover, in April 1996, Italiana Conduttori obtained, first among Italian companies in the sector, Quality Certification , according to the UNI EN ISO 9002 standard.

Fig. 16

Fig. 17

Fig. 18

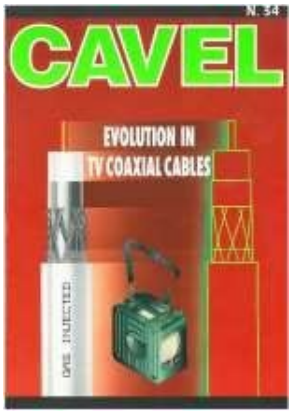


Fig. 19

1997

In 1997, we achieved another major goal by launching on the market the ***CABLEBOX*** unwinder for coaxial cables. It was simply designed to make the installer's job easier: mission accomplished. Nevertheless, it proved to be an innovative item as it also introduced a new concept of eco-friendly awareness: the reduction in packaging materials. Indeed, this is the case of rolls wrapped in simple plastic film, to be used as a refill for the CABLEBOX unwinder, in place of boxes and reels now in use.

The great success encountered by this item spurred development of a new marketing concept for CAVEL products; in short, other products dedicated to the installer's comfort were also produced, as is the case with the Cable Strippers, both for drop and distribution cables, while we further developed the marketing of many items such as connectors and tools (fig. 20).

Fig. 20

In addition, due to Telecom Italia's attempt to start implementing a digital broadband network in Italy, the so-called "SOCRATES project", we were asked to make a range of coaxial cables equipped with a ***Halogen-Free sheath***.

Although in truth the project was prematurely ended, we retained and further developed the experience we gained in extruding the halogen-free sheath, and applied it to a range of our coaxial cables for
TV. Subsequently, demand for cables with this feature began to slowly grow from those operators engaged in installing systems in public buildings, who were looking for fire-safe cables. This resulted in increasingly stringent demands for this range of cables, whose sheathing became even more sophisticated and specialized; in fact, the current compound for LSZH sheathing integrates the following features: flame retardant, low emission of non-corrosive smoke, halogen-free and UV-resistant (fig. 21).

Fig. 21

2000 – the New Millennium

Multiswitch distribution in 1st IF began in the late 1990s and became a rather interesting affair as the new millennium began, once doomsday did not take place.

To meet this market, CAVEL developed a range of ***Multicoaxial Cables***. After a few attempts to market both cables with PVC sheathing for indoor laying and others with PE sheathing for outdoor laying, the latest innovation in this range of cables is the use of a single outer sheath consisting of an EVA-based compound, which is much more flexible than PE and capable of adapting to all layings, whether indoor, outdoor or fire safety (fig. 22).

Fig. 22

2002

In November 2002 we upgraded the ***Quality System Certification***, obtaining the UNI EN ISO 91001-2000 Certification, so-called VISION 2000, issued by the national body CSQ and the international network IQNet.

2006

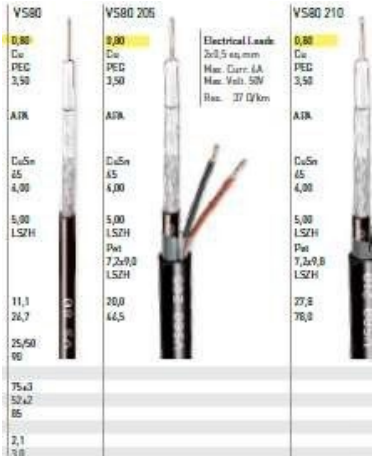
Among the range of ***hybrid cables***, thanks to joint developments with our distributor in the Scandinavian countries, DKT-Comega, we designed and began to market a special cable consisting of: a coaxial cable suitable for burial, flanked by a hollow tube, capable of later housing the installation
of cables with optical fibers, inserted using the air blown technique. This cable then evolved in early 2013, when we provided a cable of 2 optical fibers in the tube, ready for use (fig. 23).

Fig. 23

2009

Video surveillance continues to expand and specialize, demanding increasingly better features for remote cameras. CAVEL's response to this field of application was the introduction of a range of dedicated cables, which provide: incomparably lower linear losses and better shielding efficiency than any cable such as RG59 and 11, URM or KX6 and 11, and the versatility of indoor, outdoor and fire safety installation; again, thanks to a flexible, halogen-free EVA-based sheathing. The standard offer includes: a single basic coaxial cable, called VS80, and two versions equipped with electrical conductors for powering remote cameras. In terms of video signals, the VS80 allows connection sections of up to 1
.000m for analog and 200m for HD-SDI (fig. 24).

Fig. 24



From 2010 to the present

Following market research and a feasibility study, in 2009 we decided to find our place in the production and supply of data transmission cables for structured building installation, so-called ***LAN*** (Local Area Network) cables.

The challenge was to acquire, within a reasonable time frame, all the technological knowledge necessary to overcome the countless refinements made by the industry in decades of LAN cable production.

Our approach has been to start producing cables in the simplest Categories, such as: the Cat.5e and Cat.6, both U/UTP and F/UTP, with PVC, PE or LSZH sheaths, either single or twin-lead (fig. 25). In 2011 and 2012 we upgraded our facilities to increase production capacity and broaden our offer with Cat.6A cables, while in the second half of 2013 we started production of Cat. 7 and 7A (from 1000, 1200, 1500 MHz as the maximum frequency of use), provided with individually shielded pairs (PiMF) and additional shielding with tinned copper wire braid, i.e., the S/FTP and SF/FTP versions. Further investments have also enabled us to double the production capacity of these cables (fig. 26).

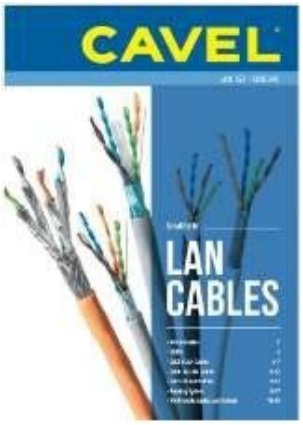


Fig. 25 and 26

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