

(Cable Management Systems)

Protection, support and transport systems for cables









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CMS Cable protection, support, and transport systems

By virtue of its 'cable protection and support' function, the Cable Management Systems trade lies at the core of electrical and communication installations and therefore also at the core of every IGNES trade. It is aimed at all market sectors: residential, commercial, industrial, and all types of infrastructure.

With their high-performance, innovative, easy-to-implement, complete products and systems, these solutions ensure the continuity of routing and integration into any type of indoor or outdoor structure and any type of environment, including the most severe. CMS manufacturers therefore contribute to transporting energy and data to the end-user point, based on the structure of buildings.

Within IGNES, the CMS trade provides solutions based on a range of complete systems, to contribute to dealing with the important issues of security and durability.

▶ What is CMS?

All constructions (housing and residential buildings, commercial buildings, industrial structures and infrastructures) are equipped with electrical networks and communication networks. These networks have different types of cable running through them (power cables, communication cables or fibreoptic cables).

The term 'CMS' covers all trunking, conduits, and cable trays, as well as office columns, and office equipment used to route energy and communication cables towards the points of use.

The purpose of the CMS is to transport, support, and protect the conductors (mechanical protection from impact or crushing, protection from chemical attack, protection from corrosion, protection from electromagnetic disturbances, etc.).

To perform these functions, our trade offers solutions to suit these various applications:

- Conduit systems for the building trade and cable protection tubes for roads and services networks,
- Profile systems (skirting, mini-trunking, and trunking), essentially in the habitable areas of residential or commercial buildings,
- Cable tray and cable ladder systems, which are mainly found in industrial environments, infrastructures, stations and tunnels, ports, airports, and engineering structures, as well as the shared areas of residential buildings, such as underground car parks, and commercial buildings.

All these product families, with their special accessories, ensure the continuity of routing and integration in all types of building: residential, commercial, industrial, and infrastructures.

They can be made of four types of material: plastic, GRP (Glass Reinforced Polyester), metal, and aluminium, to adapt to customer requirements and the type of environment.





At the core of energy and data networks

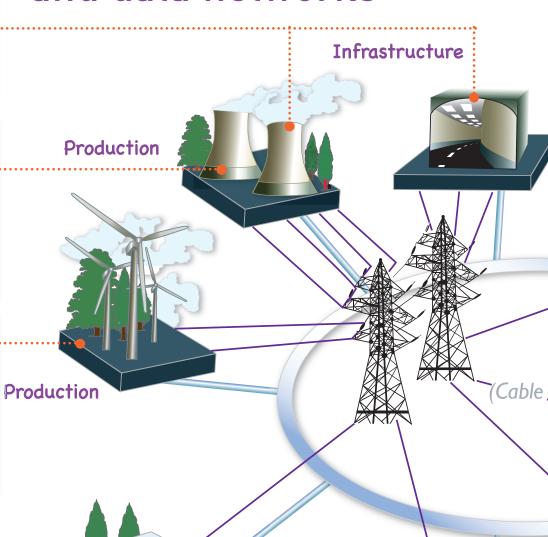


















The three major product families





► Conduits (sheaths and cable protection tubes: CPT)





▶ Profiles (skirting, mini-trunking, trunking, columns, and poles)





► Cable trays (perforated or solid sheet metal, insulator, wire) and cable ladders

All of these product families have their own special accessories, to provide:

- Routing continuity,
- Guaranteed compliance with the standards in force.

All of these product systems carry out the following functions, amongst others:

- Support, guidance, stowage, positioning,
- Protection of personnel (signage, protection index (IP code), earthing
- ▶ Protection of conductors being transported:
 - Natural ventilation to prevent overheating
 - Impact protection (IK code concerning resistance to mechanical shocks)
 - Protection from electromagnetic disturbances
 - Load-resistance, corrosion-resistance, etc.

Uses

► Table 1: Trunking Systems

	Industrial		Commercial		Collective residential		Individual residential		Infrastructure	
	New	Reno*	New	Réno*	New	Réno*	New	Réno*	New	Réno*
Mini-trunking and skirting	х	xx	х	xx		xxx		x	х	xxx
Distribution trunking	х	xx	x	xx		xx		х	xx	xxx
Installation trunking	XXX	xxx	XXX	XXX						
Workstation equipment	xx	xx	xx	xx						
Cable trunking	xxx	xxx	xx	xx	x	x		x		

^{*} Reno= Renovation / X: Moderately suitable / XX: Suitable / XXX: perfectly suitable

► Table 2: Cable tray systems

	Industrial		Commercial		Collective residential		Individual residential		Infrastructure	
	New	Réno*	New	Réno*	New	Réno*	New	Réno*	New	Réno*
Cable trays	xxx	xxx	xxx	xxx	xx	х			xxx	xxx
Cable ladders	xxx	xx	x	х	х	х			xx	х

^{*} Reno= Renovation / X: Moderately suitable / XX: Suitable / XXX: perfectly suitable

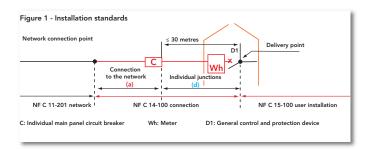
► Table 3: Conduit systems

	New	Réno*								
Conduits	XXX	xx								
CPT and buried conduits	XXX	х	xxx	Х	xxx	x	XXX	x	XXX	×

^{*} Reno= Renovation / X: Moderately suitable / XX: Suitable / XXX: perfectly suitable

Selection criteria

CMS products must be installed in accordance with installation standards NF C 14-100 (installation upstream from the energy meter) and NF C 15-100 (installation downstream from the energy meter) and the various regulations to which they are subject.



As a general rule, the selection criteria are as follows:

- Type of establishment (public buildings, high-rise buildings, residences, etc.),
- Climate conditions (indoor/outdoor, resistance to freezing, to corrosion, to UV, etc.),
- Conditions of use (e.g. fire risk, chemical risk, etc.),
- Mechanical stresses (weight of cables),
- Number of cables or conductors to be protected (e.g. for the trunking sections),
- Integration or lack of various wiring devices (power outlet, data socket, etc.),
- Budget allocated,
- Appearance.

In this context, four types of material can be used, according to the constraints of installation and

Plastic, Steel, Aluminium, GRP (Glass Reinforced Polyester)

Profiles/trunking

Certain trunking ranges are intended only to transport and protect cables and conductors ('distribution trunking'), and others have the additional possibility of incorporating wiring devices such as power outlets or communication and telephone sockets ('installation trunking'). All are equally suited to new installations or renovation.

Trunking complies with product standard NF EN 50085, and tends to be surface mounted with the required protection ratings: IP (liquid and solid penetration) and IK (shock-resistance).

Because these products are essentially surface-mounted and therefore plainly visible, aesthetic considerations are an important selection criterion.

• Plastic trunking:

Indoor applications in all segments (residential, commercial, industry).

This is the most common case, and offers good value for money.

Special plastic trunking for specific applications (rolling stock, etc.) is also available on the market, with associated standards (NF F16101, etc.).

• Steel trunking:

Indoor application, mainly in the 'commercial' (false floors and ceilings) and 'industrial' segments.

This material has high mechanical strength, and offers customers versatility in terms of shapes, sizes, colours, etc.

This steel trunking is mid-ranged in terms of price, between plastic and aluminium.

According to the situation, these metal products should be earthed.

Aluminium trunking:

Indoor applications, mainly in the commercial segment.

This material has high mechanical strength, and offers customers versatility in terms of sizes, colours, etc.

These aluminium products are top-of-the-range items. According to the situation, they should be earthed.

• GRP (Glass Reinforced Polyester):

Indoor and outdoor applications, in the industrial and infrastructure segments.

This material provides high resistance to mechanical stresses and chemical agents, e.g. in the following environments: tunnel, station, offshore platform, refinery, food industry, etc.

► Cable trays

The main function of cable trays and cable ladders is to support power cables, communication cables, and fibre optic cables, keeping them secure between anchor points.

They form complete systems including:

- Interconnectable base sections (with or without covers), connectable using splice or fish plates, allowing wiring devices to be installed,
- Support systems fixed to the building or installation, on which the base sections are installed.

These are 'structural mechanical components of the electrical installation'.

They are compliant with the IEC 61537 standard, which chiefly defines: load-resistance, electrical continuity, earthing, electromagnetic compatibility, etc.

They are defined according to five possible types: 1) Wire mesh, basket tray, 2) Perforated sheet metal, 3) Solid sheet metal, 4) Cable ladder, 5) Insulator.

Advantages of each solution

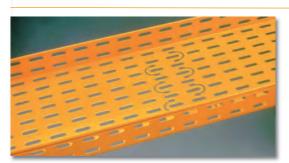
Type of cable tray



Characteristics/Advantages

Wire mesh type

- Ventilation
- Easy cable outlets
- Visible cable circuits
- Easily available in all sales channels
- Compatible will all types of cable: communication and power
- Adaptable to all installation configurations including terminal power supplies



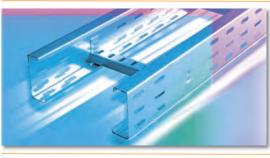
PERFORATED SHEET METAL type

- Mechanical protection
- Protection from electromagnetic disturbances
- Easily available in all sales channels
- Compatible will all types of cable: communication and power
- Adaptable to all installation configurations including terminal power supplies



SOLID SHEET METAL, TRUNKING type

- Best protection from electromagnetic disturbances
- System with cover: best protection against dust and liquids
- Suited to communication cables, including fibre-optic cables



CABLE LADDER type

- Ventilation
- Suitable for high-power cables
- Recommended for high and very high loads
- Suitable for wide span requirements
- Suitable for large cable capacities



INSULATOR type

- Mechanical protection
- Very good resistance to humid, salty, or aggressive environments
- Compatible will all types of cable: communication and power
- No earthing needed

► Conduits / CPT

There are two main families of conduit: rigid and flexible. Flexible conduits are packaged in coils. All are compliant with product standards NF EN 50086-24/A1 (CPT) and NF EN 61386-22 (conduits), which specify the following according to conduit type:

- Mechanical resistance classes (guaranteed to preserve at least a minimum section of the conduit even in the event of impact; crush-resistance for the drawing and withdrawal of conductors),
- Protection classes with respect to fire risk,
- Electrical properties (dielectric strength and insulation resistance),
- Classes concerning the resistance to penetration of liquids and solids

The systems consist of lengths of conduit and accessories for mounting and installation. They are made of different materials and coded for ease of identification.

Conduit systems for buildings (diameter 16 to 63)

The most commonly-used conduits are named in the following way in accordance with the exact characteristics of the standard:

Rigid: IRL or MRL type

- IRL (insulating, smooth, rigid) made of plastic: surface-mounted (indoor/outdoor) or flush, must not be embedded in concrete,
- MRL (metallic, smooth, rigid): surface-mounted, industrial/commercial applications, for aggressive environments. Mandatory in premises where there is risk of fire or explosion. High resistance to mechanical stresses.

▶ Flexible: ICTA, ICA, or ICTL

- ICTA (insulating, flexible, transversely bendable, corrugated) made of plastic. This is the most commonly-used conduit, universally applicable, sold with or without a wire puller and with or without pre-installed wires/cables. Surface-mounted (indoor/outdoor if UV-resistant), or flush-mounted in a slot (walls or ceilings) or embedded in concrete (walls or floors),
- ICTL (insulating, flexible, transversely bendable, smooth) made of plastic. Surface-mounted or flush (grey), flush only (floors, slabs) for orange (not fire-retardant),
- ICA (insulating, flexible, corrugated) made of plastic. Indoor or outdoor installation, surfacemounted or flush-mounted in a slot (walls or ceilings). Must not be embedded in concrete.

CPT (cable protection tubes) and buried conduits for the roads and services network (diameter from 40 to 250).

All CPT and buried conduit-type sheaths must comply with the NF EN 50086-2-4/A1 standard. The NF C 11-201 standard sets the general rules for installations for the mechanical protection of underground roads and services networks.

There are two types of product range.

CPT (cable protection tube) range

This designation applies only to tubes identified by the colour red, or black with red stripes. It is intended for the protection of power cables and low- or medium-voltage underground networks and connections..

Buried conduit range

These sheaths have the same characteristics as CPT, but are identified by a colour other than red, according to their use (other than energy networks). They are identified, for example, by the colour green, or black with green stripes when used to protect telecommunication cables.

These two ranges come in coils and in bars.

Note that the names mentioned, which define the product categories, are registered trademarks and may only be used for NF products.

Expertise

CMS professionals are experts who can guide users to make the best choice of product system according to the application and constraints involved. The technical characteristics of each product type have been tested, to guarantee that they will satisfy the relevant operating constraints.

CMS products comply with the standards for products and installations, and employ processes that confirm the control of manufacturing to ensure sustainable quality and performance:

- Raw materials purchase and inspection,
- ▶ Production and post-production inspection.

The companies representing CMS activity within IGNES work in various technical committees for the ongoing improvement of their product systems.

CMS professionals:

- are able to offer economical standard solutions or non-standard solutions for specific applications,
- offer complete solutions: cable tray products, installation accessories, support elements, connection elements, etc.
- offer additional services to guide the selection and to incorporate the best solutions: design calculations, installation manual, sizing utility software, etc.

Moreover, these manufacturers have a long history of including the environmental aspect in the development of their solutions: reducing the environmental impact of products throughout their life cycle, traceability and substitution of at-risk substances, environmental management of manufacturing sites. In 2012, this environmentally responsible mobilisation gave rise to the adoption of a PEP ecopassport environmental reference system for cable management solutions, certified by a recognised third-party body (www.pep-ecopassport.org). This reference system enables manufacturers to:

- Qualify the environmental performance of cable management solutions on an objective and coherent basis,
- Respond to the demands of eco-responsible markets by publishing PEP ecopassports in compliance with international professional reference standards (ISO 14025),
- Anticipate draft French regulations, which plan to impose a strict methodological framework on manufacturers of equipment for the building trade, based on the PEP ecopassport reference system, in 2017.

Every manufacturer that joins IGNES makes a commitment to apply a charter of professional ethics.

The Digital Engineering, Energy, and Security Industries (IGNES)

IIGNES is a professional body and member of FIEEC (Federation of Electrical, Electronic, and Communication Industries)

It covers four trades:

- Products and systems for electrical and home automation installations,
- Electronic security equipment (intrusion detection, access control and video surveillance),
- Security lighting and standalone audible alarms,
- Cable protection and support (conduit, trunking, and cable tray systems).

IGNES unites resources that are pooled to promote a shared vision of the residential and business building equipment markets, to provide the best possible responses to the following issues that are important in today's society:

- ▶ Energy performance
- Control and efficiency of control and command systems in buildings, both locally and remotely
- Digital convergence and interoperability
- Intelligent and communicating electrical systems
- Impact of smart grid solutions downstream from the meter
- Digital security of buildings (audio, intrusion detection, video, etc.)
- Infrastructures for dependent persons, home assistance, telemedicine and telehealth
- Integration of renewable energies and storage
- Charging of electric vehicles
- Distribution of direct current
- Durability: Eco-design, environmental profiles, recycling, etc.

Additional information is available at www.ignes.fr





Professional body, affiliated with the Federation of Electrical, Electronic, and Communication Industries (FIEEC)

- 60 companies or manufacturing groups
- Business volume in excess of 2 billion euros in France on the market concerned
- More than 15,000 direct jobs and 80,000 indirect jobs
- World leaders and an ecosystem of innovative SMEs.

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Members of the CMS Committee































