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An IT Solutions Company

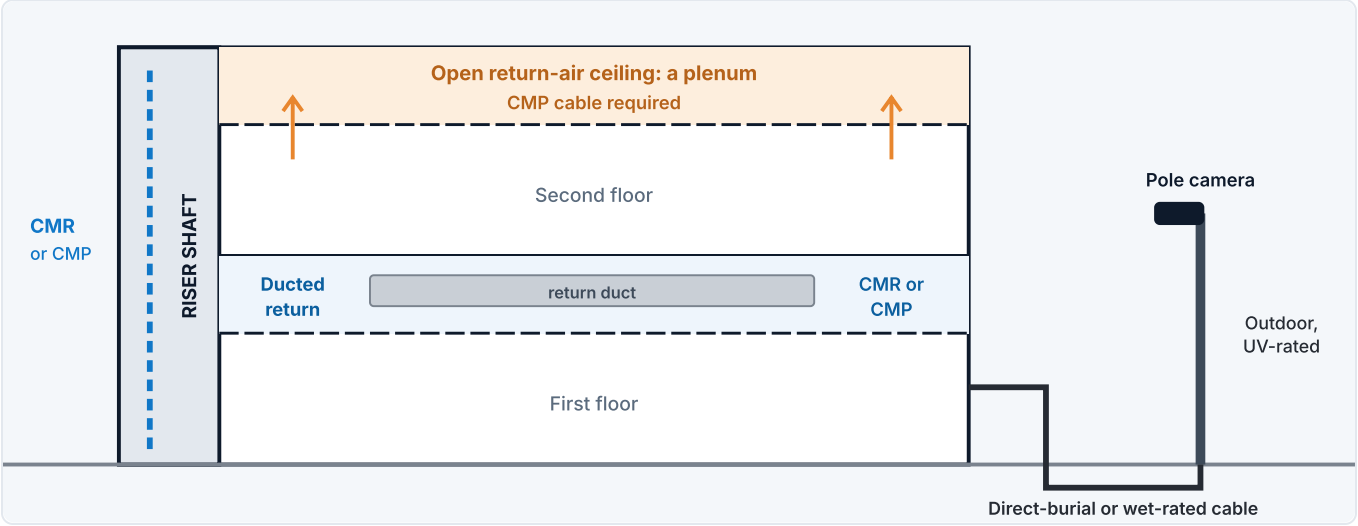
CMP vs. CMR

Plenum, riser and outdoor cable, and which one your building needs

Two boxes of Cat6 can perform identically on a tester and still not be interchangeable. The letters printed on the jacket, CMP, CMR or CM, describe how the cable behaves in a fire, and the electrical code decides which is allowed in each part of a building. Getting it wrong means failing inspection and pulling the cable back out.

THE SHORT VERSION

- CMP (plenum) is required in ceilings and floors used to move air.
- CMR (riser) is for vertical runs between floors and for ordinary non-plenum spaces.
- A higher rating can always stand in for a lower one. A lower rating can never stand in for a higher one.
- Indoor cable does not survive outdoors, and outdoor cable is restricted indoors.



One building, four cable types. The rating follows the space the cable passes through.

What the ratings mean

Marking	Name	Fire test	Where it is allowed
CMP	Plenum	NFPA 262: low flame spread and low smoke	Air-handling spaces, and anywhere below
CMR	Riser	UL 1666: must not carry fire floor to floor	Vertical shafts and general spaces; not plenums
CM / CMG	General purpose	Vertical tray flame test	Within a single floor; not risers or plenums

Marking	Name	Fire test	Where it is allowed
CMX	Limited use, outdoor	Basic flame test	Outdoors, and limited lengths indoors

What a plenum is

A plenum is a space the building uses to move air. The most common case is the gap above a suspended ceiling when it serves as the return-air path to the HVAC system, with no ductwork on the return side. Raised floors used for air are plenums as well.

The concern is smoke. In a fire, anything burning in that space is drawn into the air system and distributed through the building. Plenum cable uses jacket and insulation materials that resist burning and give off far less smoke. That is also why it costs more: the materials are more expensive.

How to tell if your ceiling is a plenum

Look above the tiles. If the return grilles open straight into the ceiling space with no duct attached, it is a plenum. If every return grille has ductwork behind it, it usually is not. Many buildings are mixed, and the mechanical drawings or the building engineer will settle it. When in doubt, the inspector's reading is the one that counts.

The substitution rule

The code ranks the ratings from most fire-resistant to least: CMP, then CMR, then CM, then CMX. Any cable may be used where a lower rating is called for. CMP is therefore legal everywhere indoors, and some owners choose it throughout so that nobody has to think about which ceiling is which. CMR in a plenum ceiling is a violation however short the run.

Outdoor and underground cable

Type	Built for	Notes
Outdoor, UV-rated	Exposed runs on walls, poles and rooftops	Jacket resists sunlight; ordinary indoor jackets crack within a few seasons
Direct burial	In the ground without conduit	Water-blocking tape or gel keeps moisture out of the pairs
Outdoor shielded	Poles, gates, building-to-building	Shield bonded to ground, with surge protection where it enters the building

- Conduit underground fills with water over time. Cable in buried conduit should be rated for wet locations.
- Outdoor cable is limited in how far it may run inside a building before changing to rated indoor cable, generally about 50 feet from the point of entry.
- Copper between buildings invites lightning damage. Fiber is the better choice for building-to-building links.

The same rules apply beyond data cable

Paging, audio, security and access control cable carry their own versions of the same ratings, marked CL2P or CL3P for plenum and CL2R or CL3R for riser. Fiber is marked OFNP and OFNR. A speaker cable above a plenum ceiling needs a plenum rating just as the network cable does.

How Smart Life handles it

- We check the ceiling type on the site walk, before the estimate is written, so the cable type is in the price from the start.
- The estimate names the cable and its rating for each area.
- Where a building mixes plenum and non-plenum space, we often recommend plenum throughout: the saving from splitting it is usually smaller than the risk.
- Openings through fire-rated walls and floors are the building's responsibility to keep sealed. We tell you where we go through them.

Cable for each space

Select an item for its data sheet.



Cat6 plenum
CMP
Return-air ceilings and anywhere indoors.
Data sheet (PDF)



Cat6 riser
CMR
Between floors and in non-plenum spaces.
Data sheet (PDF)



Cat6 outdoor
CMX · UV-rated
Exposed runs on walls, poles and rooftops.
Data sheet (PDF)



Cat6 direct burial
Gel-filled
Underground to gates, poles and detached buildings.
Data sheet (PDF)



Cat6 outdoor shielded
F/UTP · CMX
Pole-mounted and building-to-building copper.
Data sheet (PDF)



18/2 speaker cable
CL3P plenum
Paging and ceiling speakers above a plenum ceiling.
Data sheet (PDF)

Planning cable for a building? Send us the floor plan or walk it with us. We will mark what belongs where and give you a written estimate.

(502) 251-4775 · smartlifecorp.com/contact

Part of the Smart Life low-voltage cabling series: Low-Voltage Cabling · Cable Grades · Solid Copper vs. CCA · CMP vs. CMR · Power Over the Cable · Cabling for Paging and Audio.