

# Data Centre Standard EN50173-5



**Regina Good-Engelhardt,**  
R&M

As the importance of data centres in businesses increased, standards bodies recognised the need to offer guidelines specifically for the cabling structure of these data centres. The TIA-942 Telecommunications Infrastructure Standard for Data Centres was the first such standard and was released in April of 2005. In May 2007 CENELEC released the EN 50173-5 standard, which is geared toward European countries. The international standards body ISO has also recently approved a standard for data centre cabling, 24764, which uses EN 50173-5 as a base. It therefore makes sense to discuss the EN 50173-5 standard in more detail, as most of its guidelines will be reflected in the upcoming international standard.

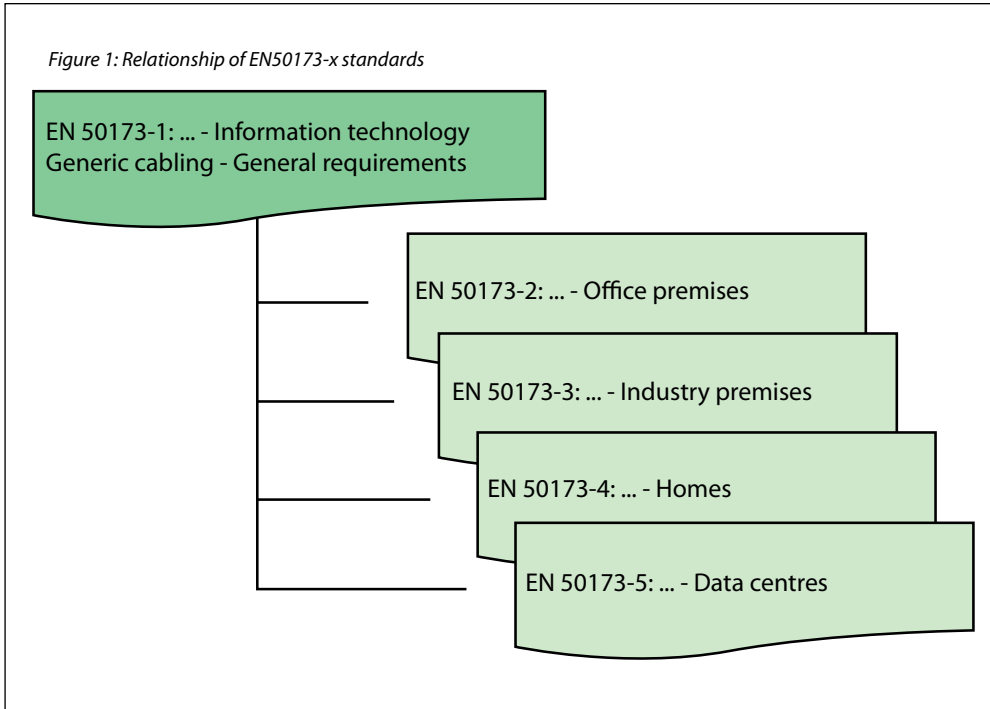
The EN50173-5 data centre standard is part of a series of standards covering the most prevalent applications of structured cabling today, namely office cabling, industrial premises, home or residential cabling and of course, data centre cabling – see Figure 1. The

base document is the EN50173-1 standard, which specifies the general requirements for generic cabling. The other standards in the series, -2, -3, -4 and -5, all reference the -1 document.

In contrast to the TIA-942 standard, the EN50173-5 concentrates in detail on the specifications for balanced and fibre optic cabling in a data centre. The TIA-942 is broader in scope as it also addresses tiering and facility considerations such as sizing, power distribution, pathways, HVAC, etc.

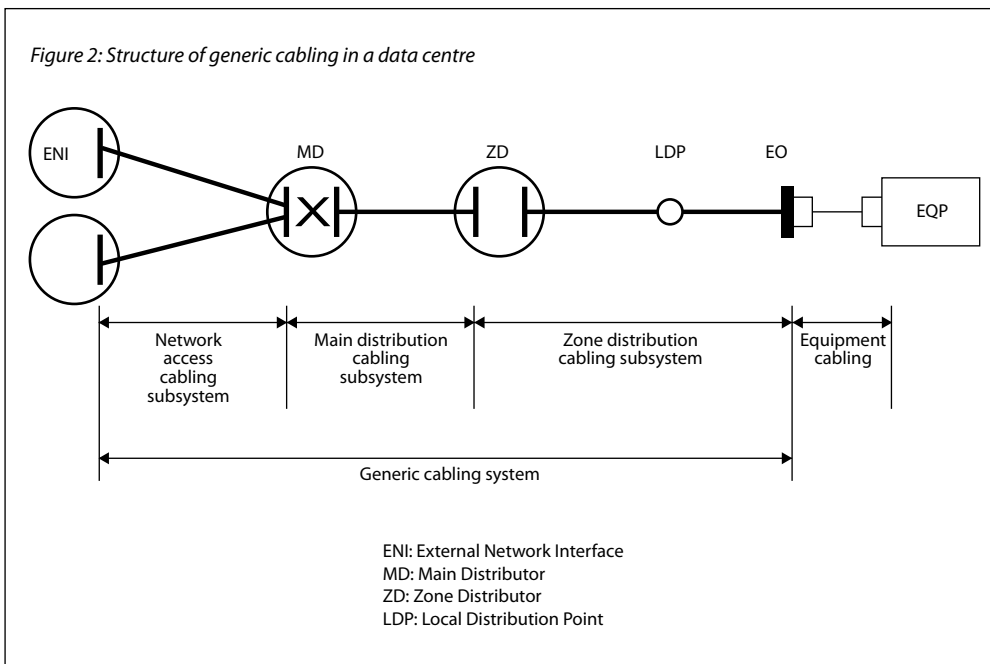
The goal of the standard is to provide a generic cabling system that can support a broad range of existing and emerging LAN, SAN and WAN applications, can scale to accommodate future growth through the planned lifetime of the data centre and is flexible enough to make modifications easy and efficient. The life expectancy of a cabling system which meets the defined requirements should exceed 10 years.

Figure 1: Relationship of EN50173-x standards



“ Standards bodies recognized the need to offer guidelines specifically for the cabling structure of these data centres. ”

Figure 2: Structure of generic cabling in a data centre



For those familiar with the structure defined for office cabling, the figure below will look familiar. The structure is largely the same but the names of the functional elements reflect those in the data centre.

Three cabling systems are defined. The network access cabling system runs from the External Network Interface (ENI), where external services are connected, to the Main Distributor (MD). The main distribution cabling system then runs to the Zone Distributor (ZD). Finally, the zone distribution

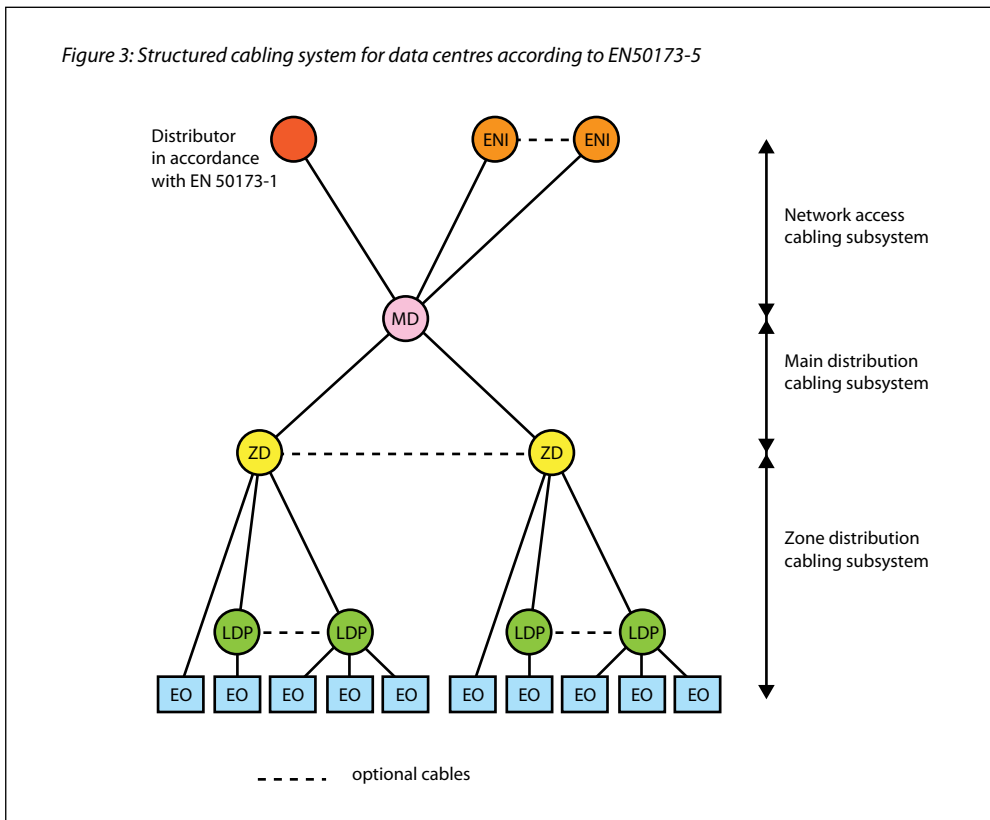
cabling system runs from the Zone Distributor (ZD) to the Equipment Outlet (EO), with the option of using a Local Distribution Point (LDP) for additional flexibility. However, the standard recommends that when an LDP is used, the length from the ZD to the LDP should be at least 15m to reduce the effects of NEXT and return loss between connectors in close proximity.

For balanced cabling, the maximum length of the physical channel is 100m. Channel equations are provided to determine the

“

The life expectancy of a cabling system which meets the defined requirements should exceed 10 years.

”



maximum length of the installation cable based on total length of patch cords, the ratio of flexible cable insertion loss to installation cable and the temperature. The minimum channel performance is Class E. In contrast, the ISO/IEC 24764 will specify Class EA as the minimum channel performance for balanced cabling in a data centre.

The maximum length for fibre optic cabling will depend on the media and can range from 300m to 10km. Multimode cabling must meet OM2 or OM3 requirements, where singlemode cabling must meet OS1 or OS2 requirements. Channel equations are also provided for fibre optic cabling to determine the maximum channel lengths based on the total number of mated connections and splices in the channel.

With the introduction of high bandwidth applications, the maximum channel insertion loss for multimode optical fibre is now a function of the length of the channel and the bandwidth performance. The following table has been provided to show the channel attenuation that may be allocated to the connecting hardware in the various cases.

Table 1: Maximum channel attenuation allocated to connecting hardware 1G and 10G applications

Application	Fibre type	Channel length							
		25m	50m	75m	100 m	200 m	300 m		
10GBASE-SR/SW	OM2 50/125	5.65	4.80	3.30					
	OM3	5.90	5.75	5.60	5.35	3.95	1.50		
10GBASE-LX4	OM2 50/125	5.90	5.85	5.73	5.57	4.40	2.17		
	OM3	5.90	5.85	5.73	5.57	4.40	2.17		
10GBASE-SX	OM2 50/125	5.90	5.80	5.70	5.60	5.05	4.35	2.45	
	OM3	6.05	5.95	5.90	5.80	5.40	4.95	4.00	2.35
10GBASE-LX	OM2 50/125	5.30	5.25	5.20	5.10	4.70	4.10	2.15	
	OM3	5.30	5.25	5.20	5.10	4.70	4.10	2.15	

The cabling system is the base upon which the entire function of the data centre is based, so it makes sense to plan the requirements very carefully. The EN50173-5 standard provides valuable guidelines to ensure that the cabling system is future-proof in terms of applications and will scale to accommodate planned growth. The choice of high quality copper and fibre optic systems ensures optimum availability, reliability and ease of use over the lifetime of the data centre. ■