CAT.6A x CAT.7A

Clase FA (CAT.7A)

1) No reconocido por la ANSI/TIA-568-C.2:

4 GENERAL

Transmission performance depends upon the characteristics of cable, connecting hardware, cords and cross-connect jumpers, the total number of connections, and the care in which they are installed and maintained. This Standard provides minimum cabling and component performance criteria as well as procedures for component and cabling performance validation.

4.1 Backward compatibility and interoperability

The requirements in this Standard are for 100 Ω category 3, 5e, 6, and 6A balanced twisted-pair cabling components. Higher grades of cabling recognize advances in cabling technology such as full-duplex transmission and the operation of high-speed applications, such as IEEE 802.3 10GBASE-T, over up to 100 meters of structured balanced cabling. Higher categories of cabling shall be backward compatible with lower categories of cabling as specified in this Standard. Applications running on lower category cabling shall be supported by higher category cabling. If different category components are to be mixed, then the combination shall meet the transmission requirements of the lowest performing category. See Table 1 for an example matrix of mated component performance representative of backward compatibility. To ensure generic cabling system performance, component requirements are specified to support interoperability when products from different manufacturers are mated.

Table 1 - Matrix of backward compatible mated component performance

		Category of Modular Connecting Hardware Performance			
		Category 3 [1]	Category 5e	Category 6	Category 6A
Modular Plug & Cord Performance	Category 3 [1]	Category 3	Category 3	Category 3	Category 3
	Category 5e	Category 3	Category 5e	Category 5e	Category 5e
	Category 6	Category 3	Category 5e	Category 6	Category 6
	Category 6A	Category 3	Category 5e	Category 6	Category 6A

[1] Category 3 plug performance requirements not specified and are assumed to be less restrictive than category 5e.

NOTE – Category 6A was referred to as augmented category 6 in ANSI/TIA-568-B.2-10.

Testing according to the procedures of this Standard is intended to ensure backward compatibility with lower categories.

4.2 Recognized categories

The recognized categories of balanced twisted-pair cabling and components are:

Category 3: This designation applies to 100 Ω balanced twisted-pair cabling and components whose transmission characteristics are specified from 1 to 16 MHz.

Category 5e: This designation applies to 100 Ω balanced twisted-pair cabling and components whose transmission characteristics are specified from 1 to 100 MHz.

Category 6: This designation applies to 100 Ω balanced twisted-pair cabling and components whose transmission characteristics are specified from 1 to 250 MHz.

Category 6A: This designation applies to 100 Ω balanced twisted-pair cabling and components whose transmission characteristics are specified from 1 to 500 MHz.

Category 1, 2, 4 and 5 cabling and components are not recognized as part of this Standard and, therefore, their transmission characteristics are not specified. Category 5 transmission characteristics, used in "legacy" cabling installations, are provided for reference in Annex M.

Table 1 - Matrix of backward compatible mated component performance

		Category of Modular Connecting Hardware Performance			
		Category 3 [1]	Category 5e	Category 6	Category 6A
Modular Plug & Cord Performance	Category 3 [1]	Category 3	Category 3	Category 3	Category 3
	Category 5e	Category 3	Category 5e	Category 5e	Category 5e
	Category 6	Category 3	Category 5e	Category 6	Category 6
	Category 6A	Category 3	Category 5e	Category 6	Category 6A

[1] Category 3 plug performance requirements not specified and are assumed to be less restrictive than category 5e.

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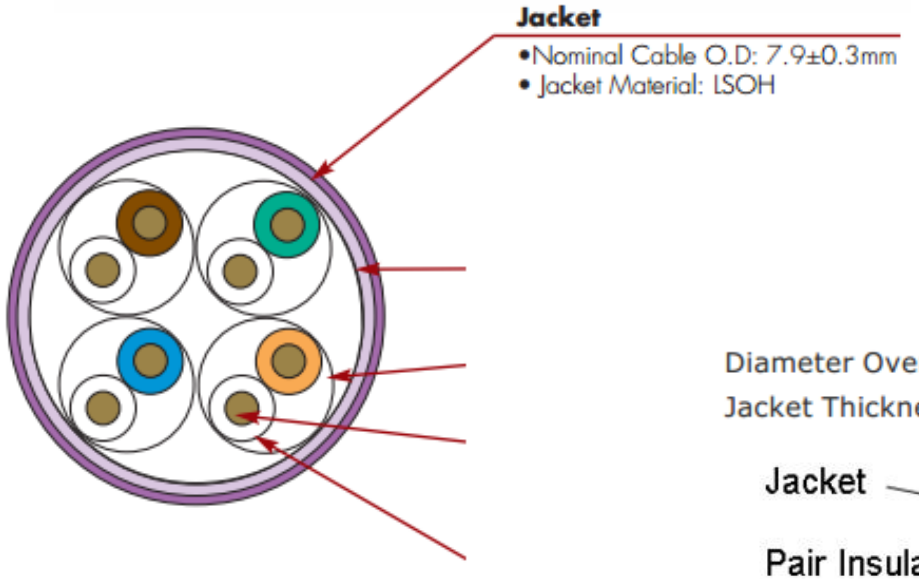
Category 6A: This designation applies to 100 Ω balanced twisted-pair cabling and components whose transmission characteristics are specified from 1 to 500 MHz.

Category 1, 2, 4 and 5 cabling and components are not recognized as part of this Standard and, therefore, their transmission characteristics are not specified. Category 5 transmission characteristics, used in "legacy" cabling installations, are provided for reference in Annex M.

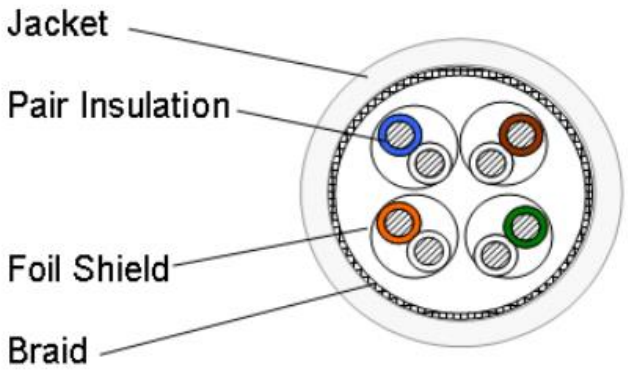
Clase FA (CAT.7A)

2) Diámetro del cable más grande:



8,20mm

Diameter Over Jacket	7.493 mm
Jacket Thickness	0.635 mm



8,12mm

Cable diameter: 8.35mm (0.329 in.) nominal

8,35mm

Clase FA (CAT.7A)

3) Mayor costo em infraestructura:

Debido al diámetro del cable, va a ser necesario la instalación de canaletas más amplias para cumplir con la norma ANSI/TIA-569 y dejar como mínimo el 50% de espacio disponible.

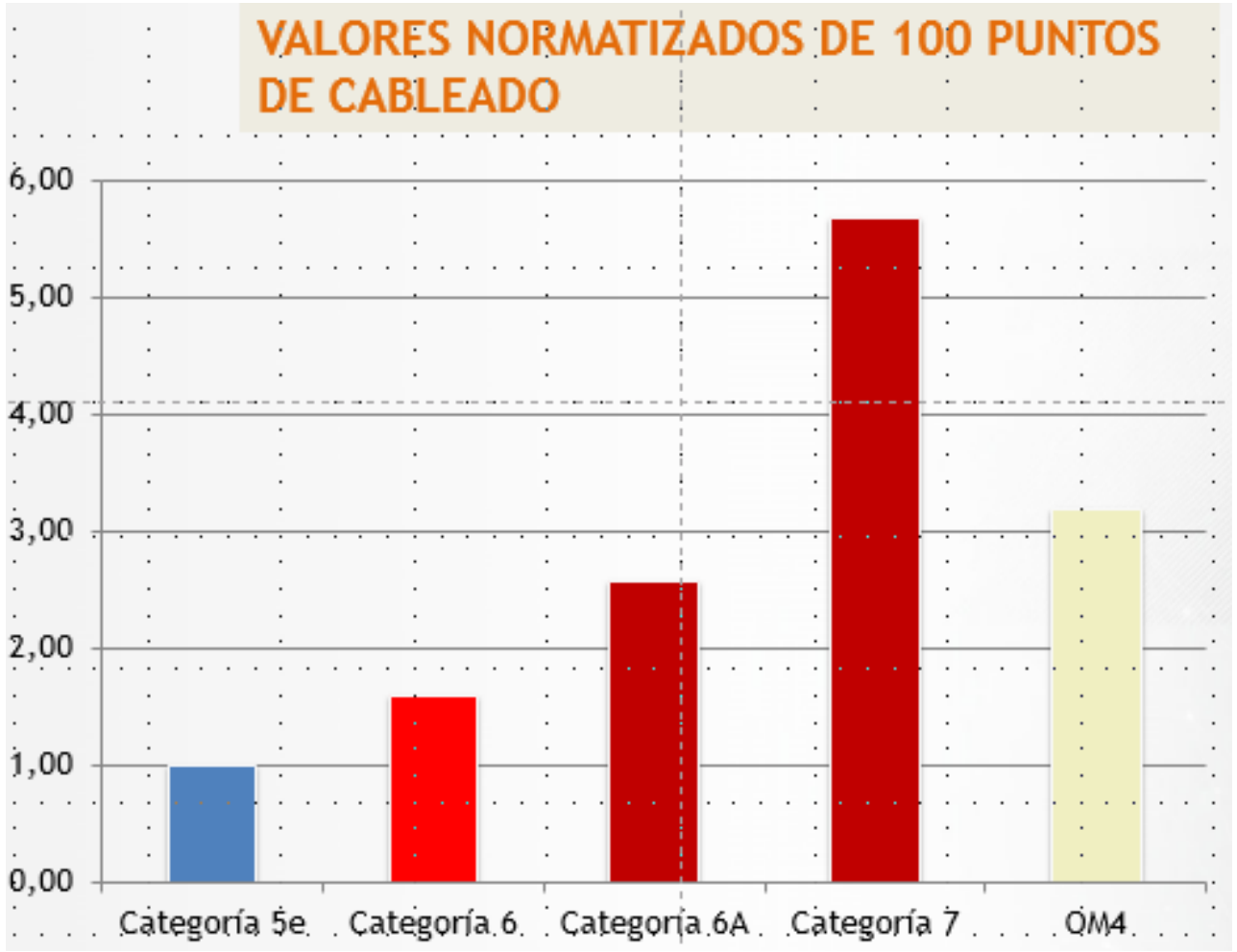
Cable diameter: 8.35mm (0.329 in.) nominal

8,35mm

Ductos	3,3	4,6	5,6	6,1	7,4	7,9	9,4	13,5	15,8	17,8
½	1	1	0	0	0	0	0	0	0	0
¾	6	5	4	3	2	2	1	0	0	0
1	8	8	7	6	3	3	2	1	0	0
1 ¼	16	14	12	10	6	4	3	1	1	1
1 ½	20	18	16	15	7	6	4	2	1	1
2	30	26	22	20	14	12	7	4	3	2
2 ½	45	40	36	30	17	14	12	6	3	3
3	70	60	50	40	20	20	17	7	6	6
3 ½	-	-	-	-	-	-	22	12	7	6
4	-	-	-	-	-	-	30	14	12	7

Clase FA (CAT.7A)

4) Solución más cara que el CAT.6A (casi el triple, con mano de obra):

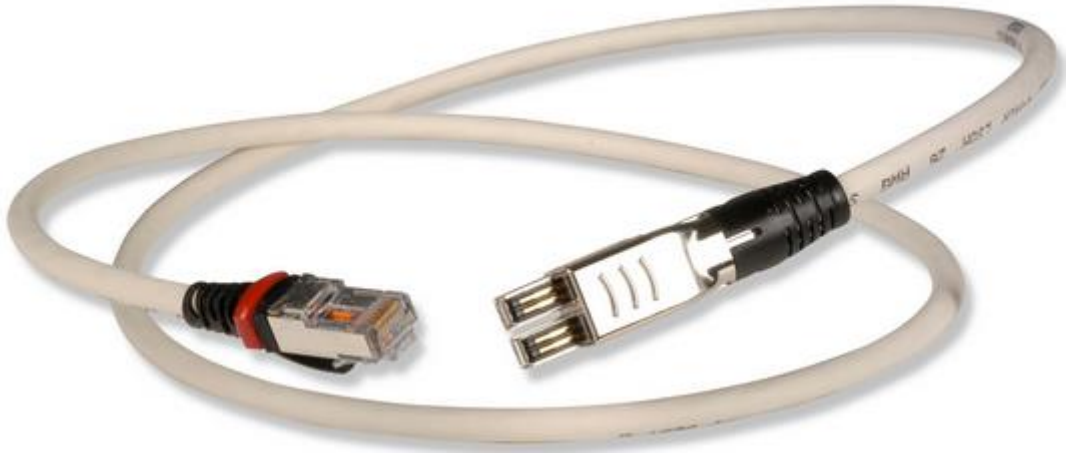


Clase FA (CAT.7A)

5) Conectores (plugs y jacks) no comerciales, no cumple con estandard RJ-45 utilizado en computadoras. No existe patch cord en el canal ***completo*** CAT.7A con aplicación comercial:

Clase FA (CAT.7A)

6) Los Patch cords tienen que ser híbridos para conectarse con plug RJ-45 a computadoras, de esta forma, el plug tiene que ser CAT.6A:



Clase F_A (CAT.7A)

7) Por definición de normatividad, el componente con categoria inferior dentro del canal limita la certificación/uso/desempeño a la categoria inferior de dicho componente, luego, la certificación en el caso anterior seria en CAT.6A:

ANSI/TIA-568-C.2

4 GENERAL

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The requirements in this Standard are for 100 Ω category 3, 5e, 6, and 6A balanced twisted-pair cabling components. Higher grades of cabling recognize advances in cabling technology such as full-duplex transmission and the operation of high-speed applications, such as IEEE 802.3 10GBASE-T, over up to 100 meters of structured balanced cabling. Higher categories of cabling shall be backward compatible with lower categories of cabling as specified in this Standard. Applications running on lower category cabling shall be supported by higher category cabling. If different category components are to be mixed, then the combination shall meet the transmission requirements of the lowest performing category. See Table 1 for an example matrix of mated component performance representative of backward compatibility. To ensure generic cabling system performance, component requirements are specified to support interoperability when products from different manufacturers are mated.

Clase F_A (CAT.7A)

8) Conforme la ISO/IEC 11801, tiene la misma tasa de transmisión (10GBase-T) que el CAT.6A para canal de 100 m:

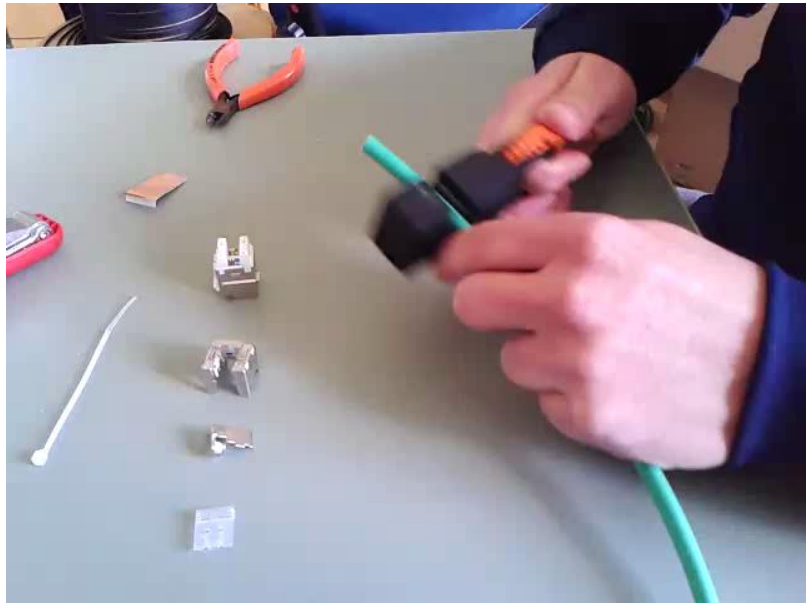
Application	Specification reference	Date	Additional name
Class E_A 2008 (defined up to 500 MHz)			
ATM LAN 1,2 Gbit/s	ATM Forum af-phy-0162.000	2001	ATM-1200/Category 6
Ethernet 10GBase-T	IEEE 802.3an	2006	10Gigabit Ethernet
Fibre Channel 2 Gbit/s	INCITS 435	2007	Twisted-pair Fibre Channel 2G
Fibre Channel 4 Gbit/s	INCITS 435	2007	Twisted-pair Fibre Channel 4G
Class F 2002 (defined up to 600 MHz)			
ATM LAN 1,2 Gbit/s	ATM Forum af-phy-xxxx.000	2001	ATM-1200
Ethernet 10GBase-T	IEEE 802.3an	2006	10 Gigabit Ethernet
FC-100-DF-EL-S	ISO/IEC 14165-114	2005	FA – FC-100-DF-EL-S
Class F_A 2008 (defined up to 1 000 MHz)			
ATM LAN 1.2 Gbit/s	ATM Forum af-phy-xxxx.000	2001	ATM-1200
Ethernet 10GBase-T	IEEE 802.3an	2006	10 Gigabit Ethernet
FC-100-DF-EL-S	ISO/IEC 14165-114	2005	FA – FC-100-DF-EL-S
Applications supported by a given class are also supported by higher classes. Some applications may run on a lower class in cases where the specific channel in question meets the performance criteria of the application.			
a The minimum performance of class E 2002 channels does not support 10GBase-T. Channels implemented using category 6 2002 components will support 10GBase-T provided they meet the additional requirements specified in ISO/IEC TR-24750. Such support may be limited to channels shorter than 100 m. Class E_A or better is recommended for new installations.			
b including support for remote power feeding defined by IEEE 802.3af: 2003.			

Applications supported by generic balanced cabling listed in Table F.1 use the pin assignment recorded in Table F.2. This mapping relates the modular connector pinning specified by each application standard to the channel performance classes specified in Clause 6.

Table F.1 – Applications using balanced cabling

Clase FA (CAT.7A)

9) Su tiempo de instalación es mucho mayor al tiempo de instalación de un Cat.6A



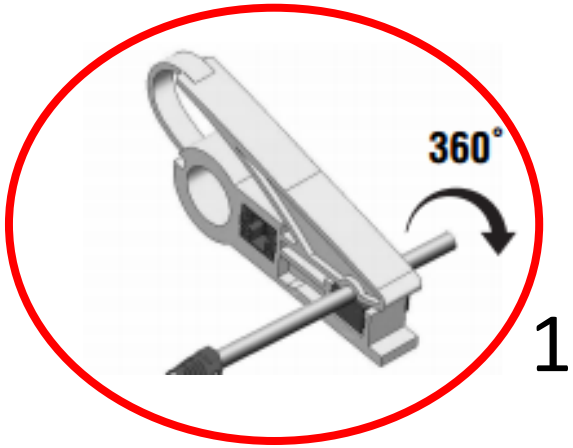
Furukawa Cat.6A: 1 min 47 segundos

Otros Cat.7: 4 min

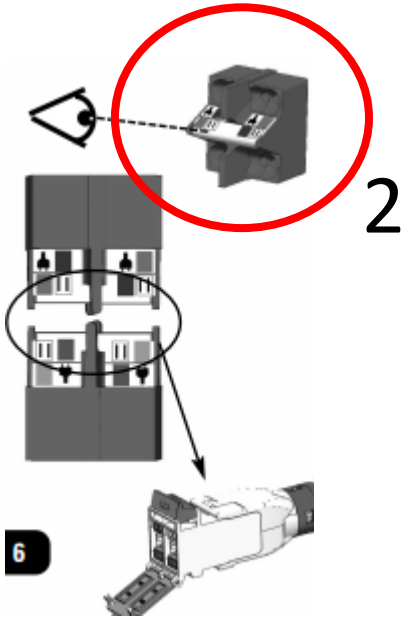
La diferencia en los tiempos de instalación es del doble!!!!

Clase FA (CAT.7A)

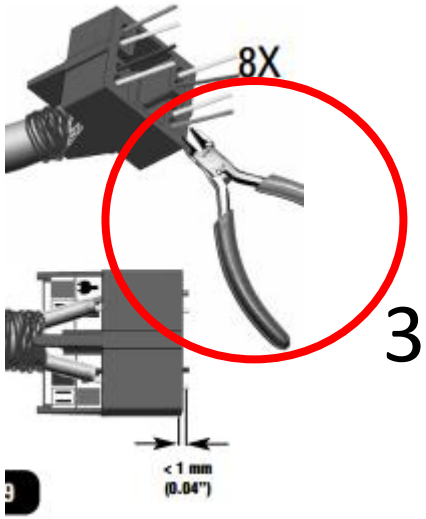
10) Se requiere de mas herramientas y piezas para realizar su conectividad.



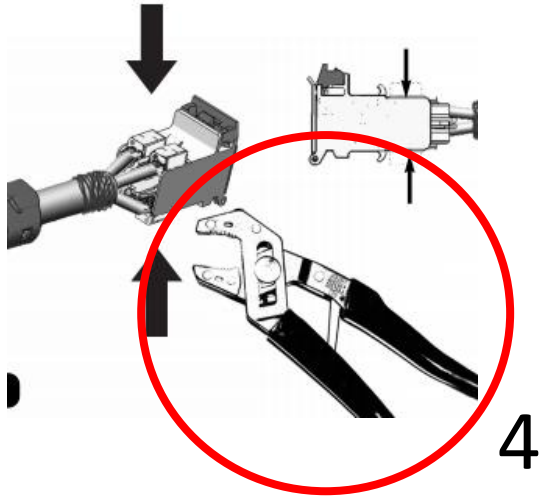
1



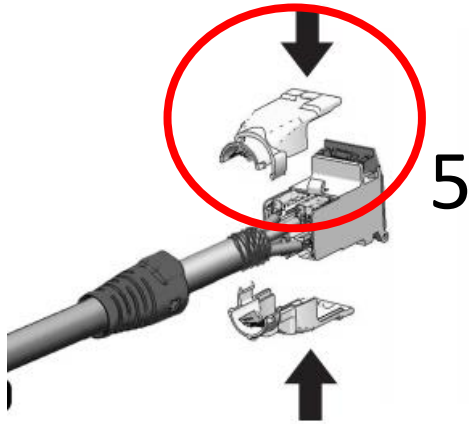
2



3



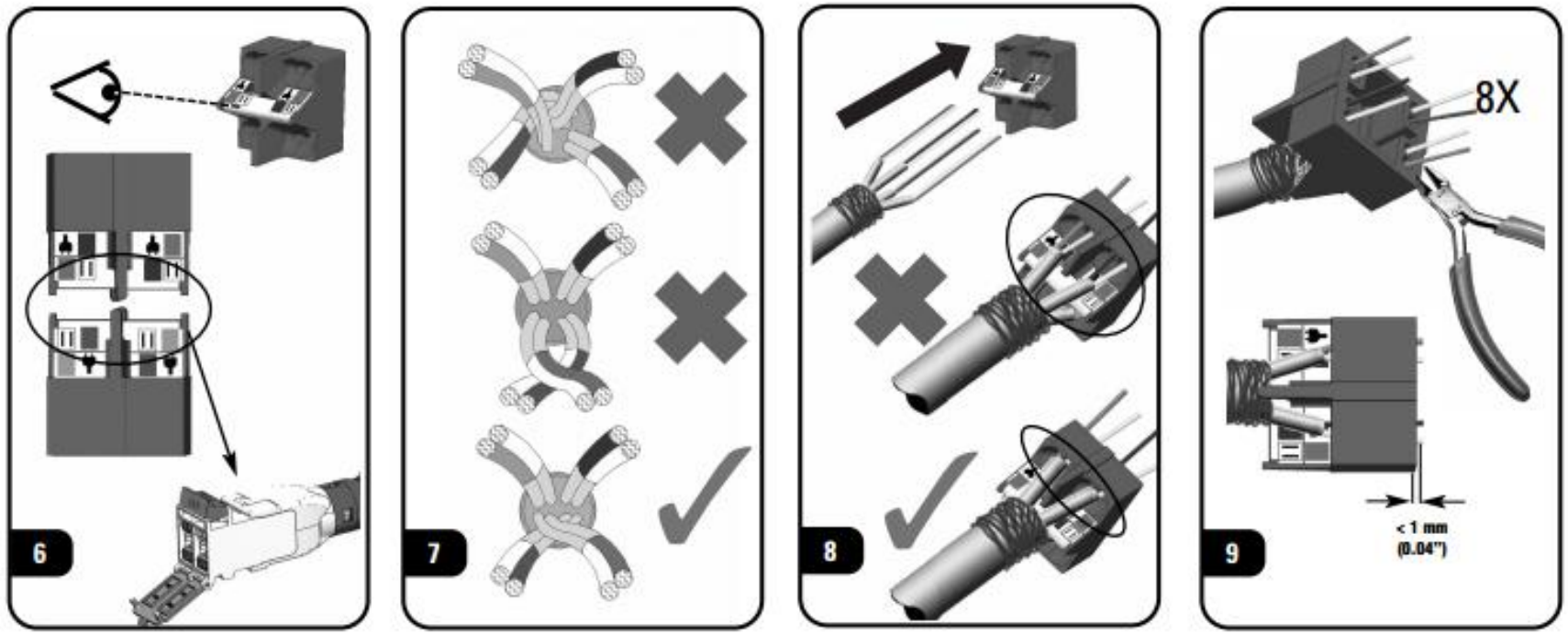
4



5

Clase FA (CAT.7A)

11) Se requiere de una pieza adicional para alinear los pares en el conector, de perderse esta pieza la conexión no será la adecuada.



Clase FA (CAT.7A)

12) Según relatos de instaladores, una vez instalado el conector no es posible reutilizarlo, algo que genera sobrecostos pues se debe comprar un conector nuevo.

Clase E_A (CAT.6A)

1) Costo del canal más económico (casi la mitad);
2) Menor diámetro del cable;
3) Menor infraestructura;
4) Actual y más avanzada tecnologia reconocida por la ANSI/EIA/TIA
5) Conectividad comercial (plugs y jacks) estandar RJ-45;
6) Patch cords listos para conexión a computadoras sin la necesidad de patch cords híbridos;

Clase E_A (CAT.6A)

7) Certificación de canal completo CAT.6A por la ANSI/EIA/TIA o Clase E_A por la ISO/IEC 11801;

8) Conforme la ISO/IEC 11801, tiene la misma tasa de transmisión (10GBase-T) que el CAT.7A (Clase F_A) para canal de 100 m;

Conclusión

- Por principio normativo, el cableado estructurado debe ser compuesto minimamente por dos puntos de telecomunicaciones por área de trabajo;
- Los protocolos de comunicaciones actuales 1G y 10G conforme la IEEE 802.3 necesitan utilizar los 4 pares al mismo tiempo para transmisiones de datos;

Conclusión

- El cableado CAT.6A F/UTP es el más recomendado por disponer el mejor costo x beneficio.
- Para requisitos superiores al CAT.6A la solución recomendada es la migración para fibra óptica.