

Safe and easy ways to support the latest PoE applications



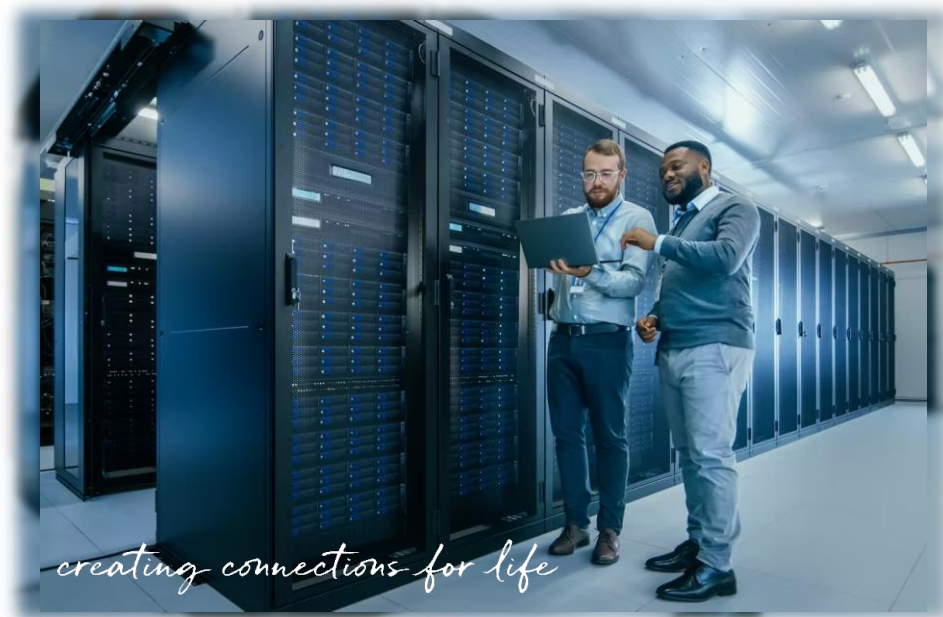
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Regional Technical Manager Australia / New
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ICT SUMMIT
CONFERENCIA & EXHIBICION
MÉXICO 2025

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SAFE AND EASY WAYS TO SUPPORT THE LATEST PoE APPLICATIONS



<https://csp.molex.com>

MAY 2025



OVERVIEW – PoE APPLICATIONS & RELATED STANDARDS COMMON PoE TRAPS NOT TO FALL INTO



**IS MY CABLING SYSTEM ANSI/TIA-568, OR ISO/IEC 11801, OR EN 50174 & EN 50173 OR AS/NZS 3084
AND AS/NZS 11801 COMPLIANT...**



PoE Applications & Related Standards

TYPE 1			TYPE 2	TYPE 3		TYPE 4		PoH	UPoE	UPoE+
Class 1 4 W	Class 2 7 W	Class 3 15.4 W	Class 4 30 W	Class 5 45 W	Class 6 60 W	Class 7 75 W	Class 8 90 W	100W	Proprietar y 60W	Proprietar y 90W
350mA			600mA			960mA		1000mA	600mA	960mA
2 PAIRS ENERGIZED				4 PAIRS ENERGIZED						
IEEE 802.3af			IEEE 802.3at	IEEE 802.3bt				Proprietar y	Proprietary	



PoE Applications & Related Standards

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	TYPE 1				TYPE 2	TYPE 3		TYPE 4	
PSE	Class 1 4 W	Class 2 7 W	Class 3 15.4 W	Class 4 30 W	Class 5 45 W	Class 6 60 W	Class 7 75 W	Class 8 90 W	
	2 PAIRS ENERGIZED				4 PAIRS ENERGIZED				
PD	Class 1 3.84 W	Class 2 6.49 W	Class 3 12.95 W	Class 4 25.5W	Class 5 40 W	Class 6 51 W	Class 7 62 W	Class 8 73 W	

PoE Applications & Related Standards

CABLING

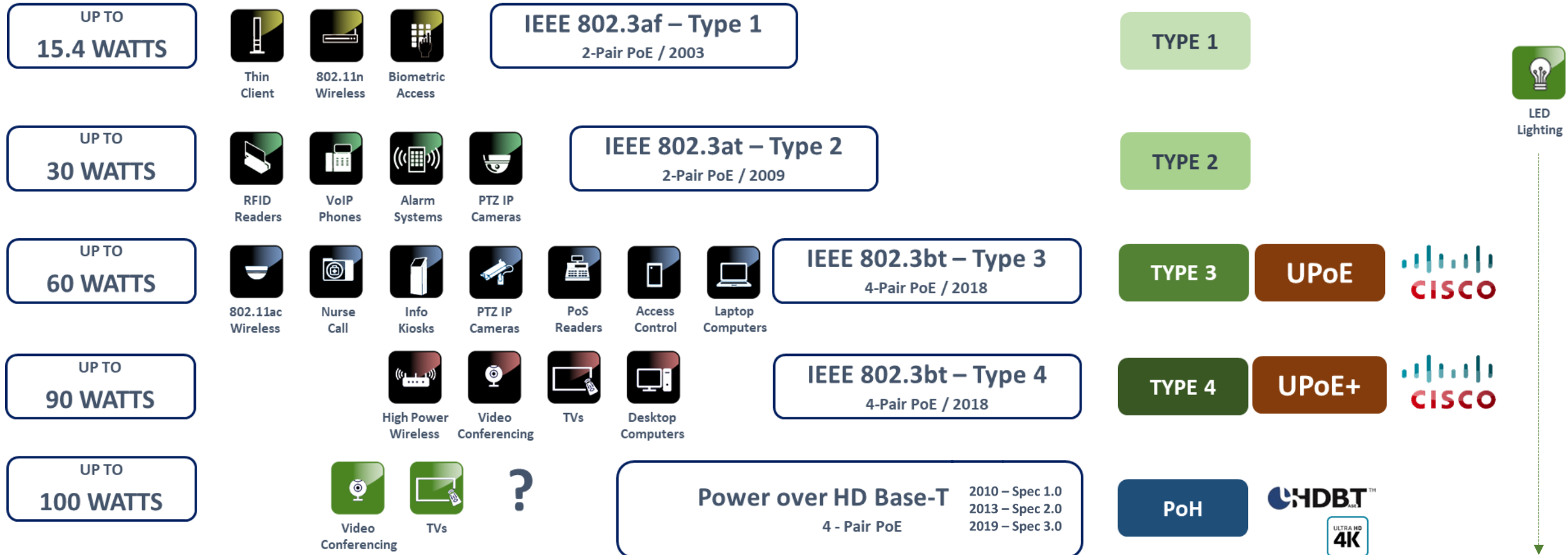
ANSI/TIA-568
ISO/IEC 11801
EN 50173/2017 and EN 50174:2018
AS/NZ 11801

REMOTE POWERING

ANSI/TIA-184-A:2017 and addendum
A1:2019
ISO/IEC TS 29125 Ed 2.0:2014
EN CLC/TR 507174-99-1:2015
IEC 60512-99-001



PoE Applications & Related Standards



LED Lighting

PoE Applications & Related Standards

TYPE 1			TYPE 2	TYPE 3		TYPE 4		PoH	UPoE	UPoE+
Class 1 4 W	Class 2 7 W	Class 3 15.4 W	Class 4 30 W	Class 5 45 W	Class 6 60 W	Class 7 75 W	Class 8 90 W	100W	Proprietary 60W	Proprietary 90W
350mA				600mA		960mA		1000mA	600mA	960mA
2 PAIRS ENERGIZED				4 PAIRS ENERGIZED						
IEEE 802.3af			IEEE 802.3at	IEEE 802.3bt				Proprietary	Proprietary	



CABLING

ANSI/TIA-568.x-D:2015
ISO/IEC 11801.x:2017
EN 50173/2017 and EN 50174:2018
AS/NZ 11801.1

AND



REMOTE POWERING

ANSI/TIA-184-A:2017 and addendum A1:2019
ISO/IEC TS 29125 Ed 2.0:2014
EN CLC/TR 507174-99-1:2015

Common Traps to Not Fall Into



THE SHORT TERM STRATEGY
i.e. "My current needs"



USING CCA CABLES
(Copper Coated Aluminum)



**CREATING BUNDLES WITH
MORE THAN 24 CABLES**

RY 6A IS THE DEFACTO R

ANSI/TIA-184-A

ISO

EN 50173

AS

EN CLC/TR 5017



Common Traps to Not Fall Into



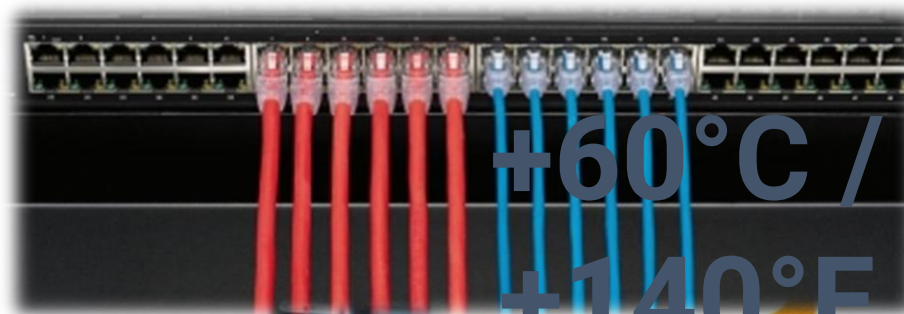
IGNORING DESIGN RULES
WHEN LONG CORDS
ARE USED



IGNORING DESIGN RULES
WHEN 28 AWG CORDS
ARE USED



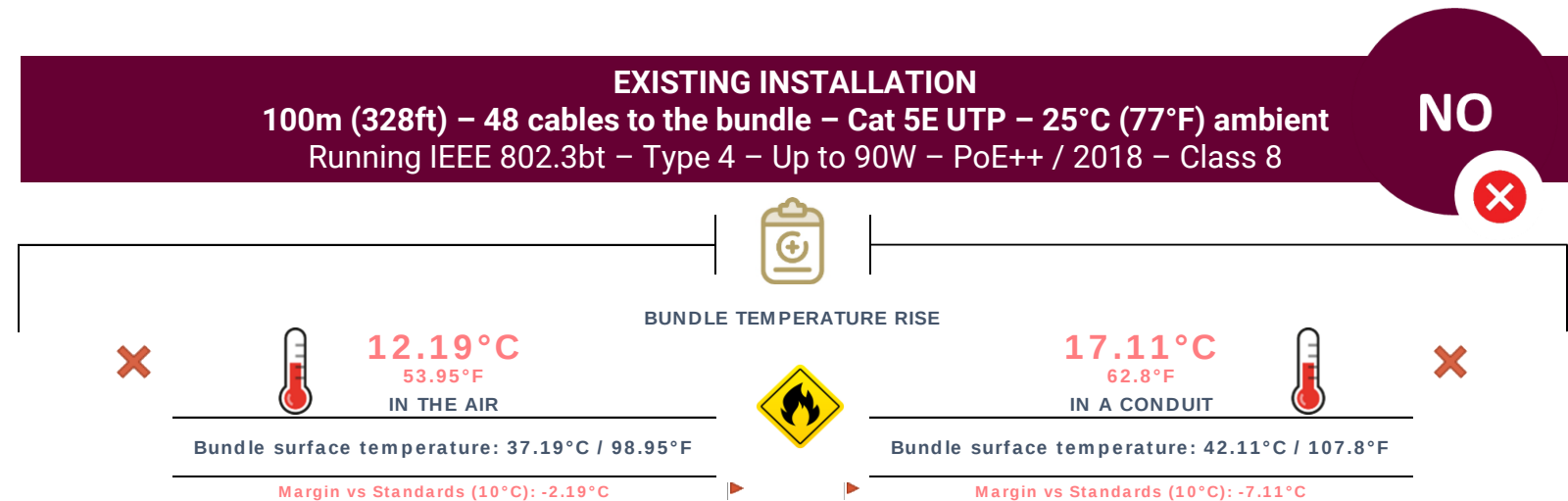
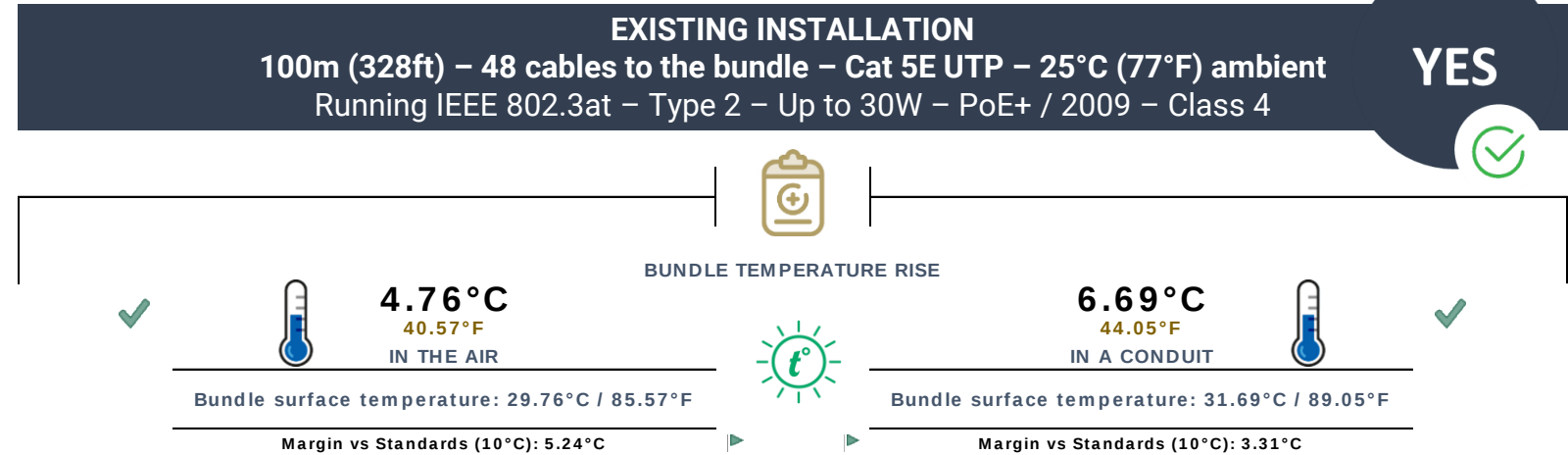
GOING OVER THE MAX.
BUNDLE T° RISE
RECOMMENDED BY STANDARDS



Common Traps to Not Fall Into



**BELIEVING MY CABLING WILL
SUPPORT ALL PoE
APPLICATIONS
BECAUSE IT IS COMPLIANT
WITH THE LATEST ANSI/TIA,
ISO/IEC AND AS/NZ
STANDARDS**



Common Traps to Not Fall Into



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STANDARDS**

EXISTING INSTALLATION

100m (328ft) – 48 cables to the bundle – Cat 5E UTP – 25°C (77°F) ambient
Running IEEE 802.3at – Type 2 – Up to 30W – PoE+ / 2009 – Class 4

YES



TEMPERATURE DIFFERENCE FROM BUNDLE
SURFACE TO BUNDLE CENTER

6.72°C

44.1°F

HIGHEST TEMPERATURE AT
THE CENTER OF THE
BUNDLE (AIR)

36.48°C

97.67°F

HIGHEST TEMPERATURE AT
THE CENTER OF THE
BUNDLE (CONDUIT)

38.41°C

101.14°F

INSERTION LOSS PENALTY FOR THE HOTTEST CABLE IN THE CENTER



There will typically be 2.69% more attenuation in dB in the hottest cable at the center of the bundle...

4.76°C
40.57°F

Bundle T° rise

36.48°C
97.67°F

Highest T°

29.76°C
85.57°F

Space/Air around
The bundle

6.69°C
44.05°F

Bundle T° rise

38.41°C
101.14°F

Highest T°

31.69°C
89.05°F

Space/Air around
The bundle

Common Traps to Not Fall Into



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BECAUSE IT IS COMPLIANT
WITH THE LATEST ANSI/TIA,
ISO/IEC AND AS/NZ
STANDARDS

EXISTING INSTALLATION

100m (328ft) – 48 cables to the bundle – Cat 5E UTP – 25°C (77°F) ambient
Running IEEE 802.3bt – Type 4 – Up to 90W – PoE++ / 2018 – Class 8

NO



TEMPERATURE DIFFERENCE FROM BUNDLE
SURFACE TO BUNDLE CENTER

34.41°C

93.94°F

HIGHEST TEMPERATURE AT
THE CENTER OF THE
BUNDLE (AIR)

71.6°C

160.88°F

HIGHEST TEMPERATURE AT
THE CENTER OF THE
BUNDLE (CONDUIT)

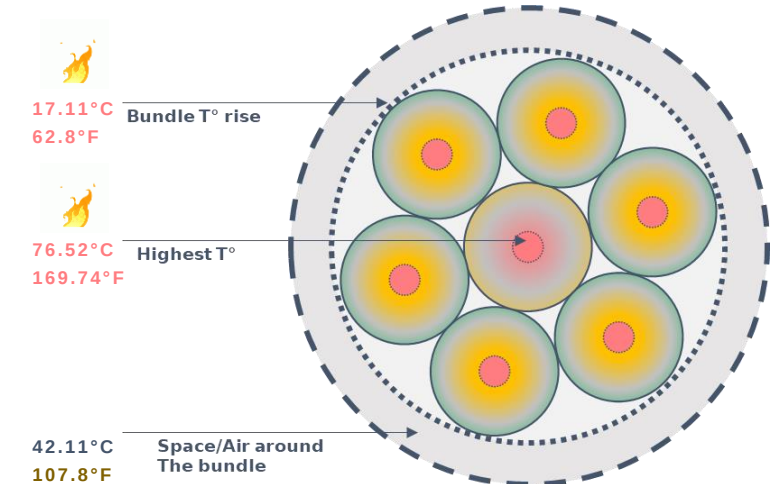
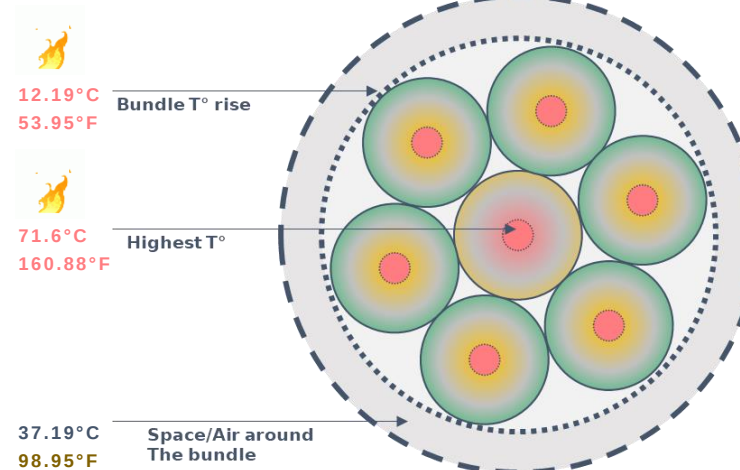
76.52°C

169.74°F

INSERTION LOSS PENALTY FOR THE HOTTEST CABLE IN THE CENTER



There will typically be 13.77% more attenuation in dB in the hottest cable at the center of the bundle...



Common Traps to Not Fall Into



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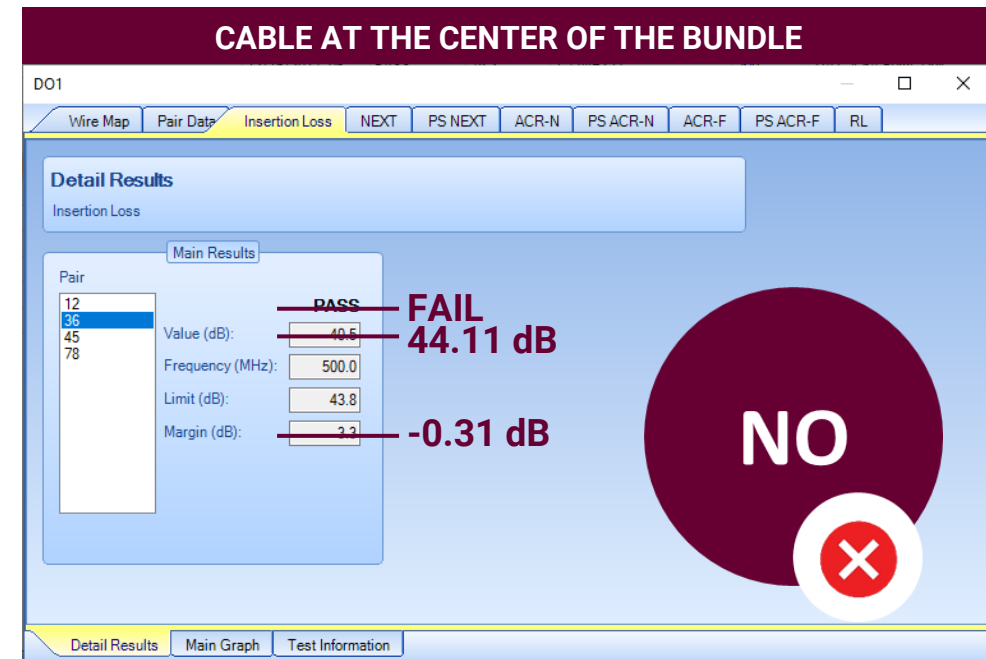
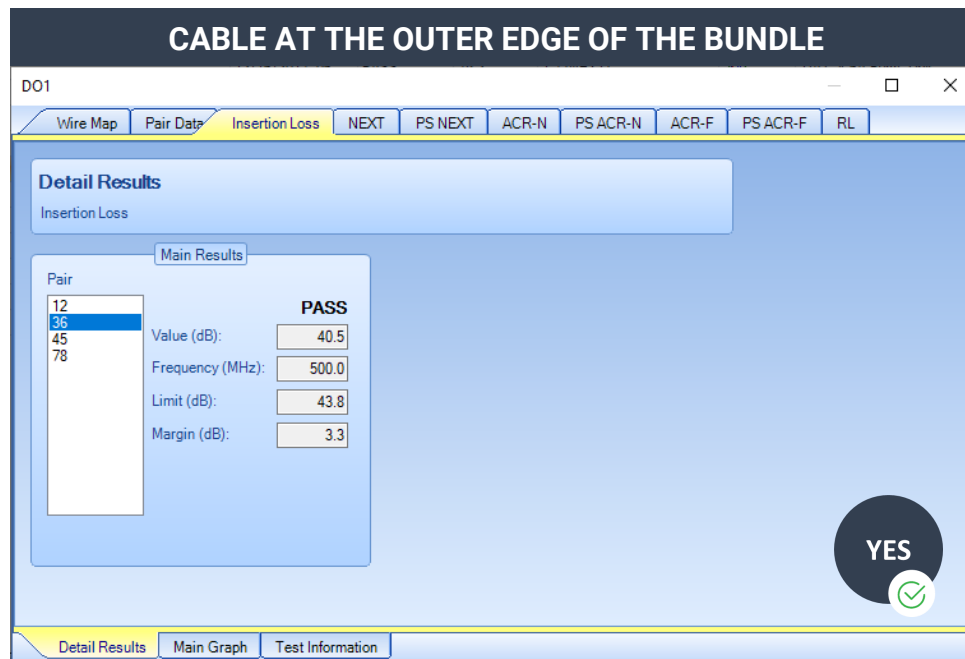
EXISTING INSTALLATION

100m (328ft) – 72 cables to the bundle – Cat 6A – 25°C (77°F) ambient
Running IEEE 802.3bt – Type 4 – Up to 90W – PoE++ / 2018 – Class 8

INSERTION LOSS PENALTY FOR THE HOTTEST CABLE IN THE CENTER



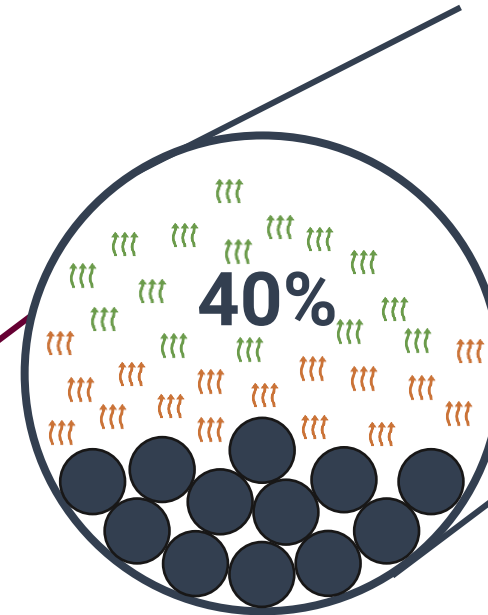
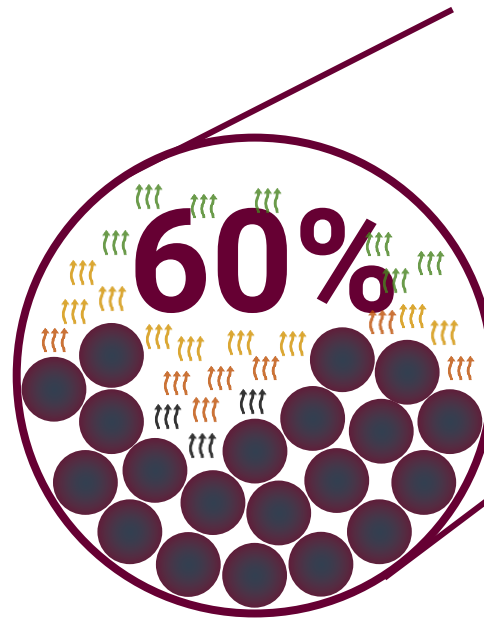
There will typically be 8.93% more attenuation in dB in the hottest cable at the center of the bundle...



Common Traps to Not Fall Into

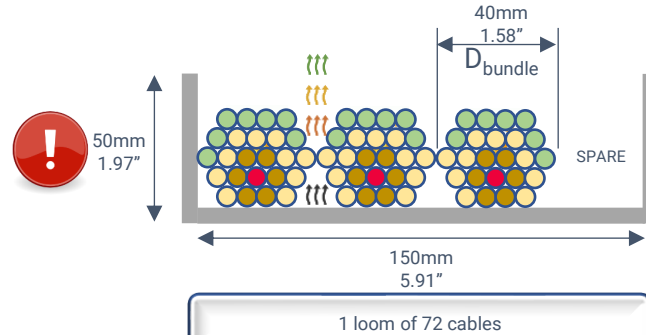


NOT REDUCING THE CABLE
FILL RATE IN CONDUITS

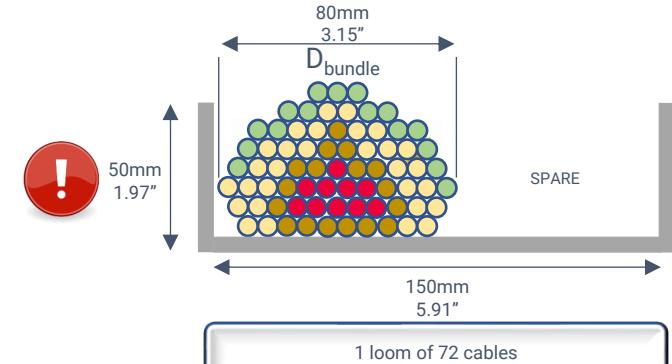


Common Traps to Not Fall Into

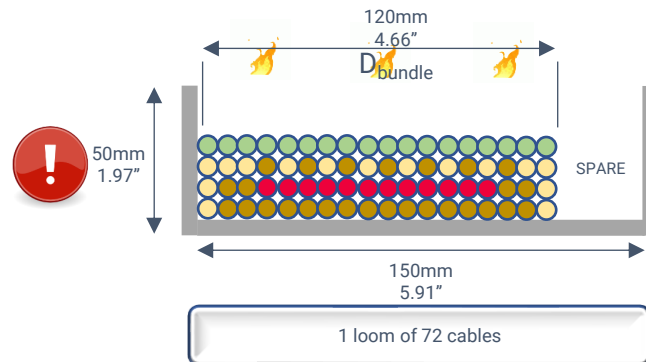
OVERHEAT: 4% OF CABLES



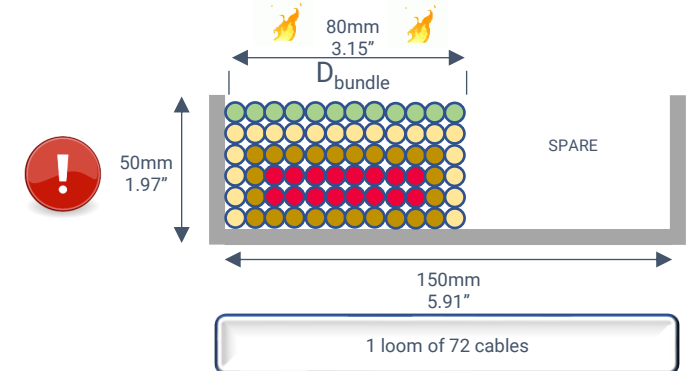
OVERHEAT: 14% OF CABLES



OVERHEAT: 22% OF CABLES



OVERHEAT: 22% OF CABLES

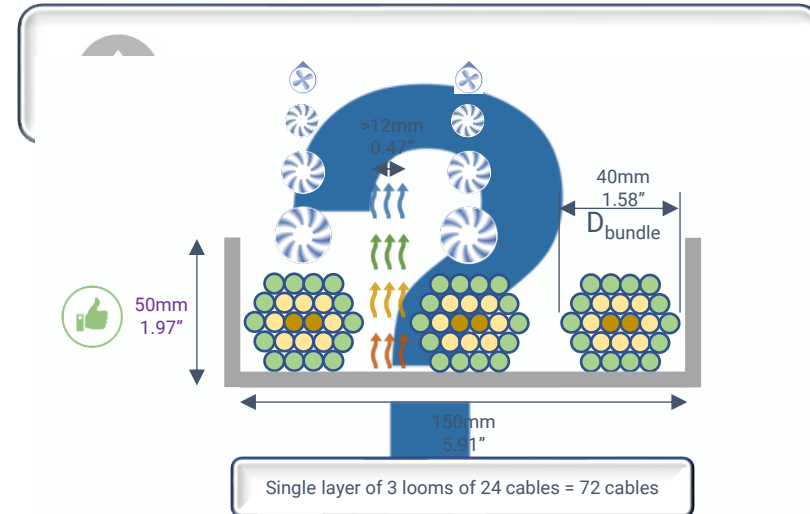


NOT PAYING ATTENTION TO
CABLE BUNDLES
LAYOUTS

Common Traps to Not Fall Into



**NOT PAYING ATTENTION TO
CABLE BUNDLES
LAYOUTS**



COMPLIANT



ISO/IEC TS 29125:2017
SA TS 29125:2019
TIA TSB-184-A:2017

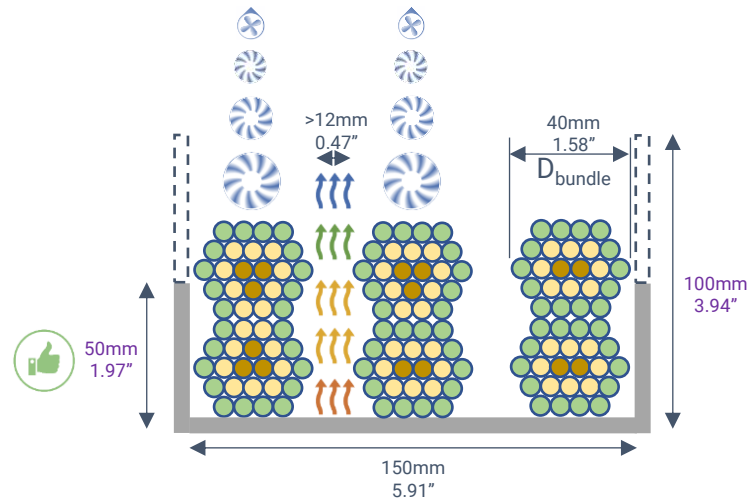
Common Traps to Not Fall Into



OVERHEAT: 0% OF CABLES



NOT PAYING ATTENTION TO
CABLE BUNDLES
LAYOUTS



Double layer of 6 looms of 24 cables = 144 cables



Mind your cable tray capacity !

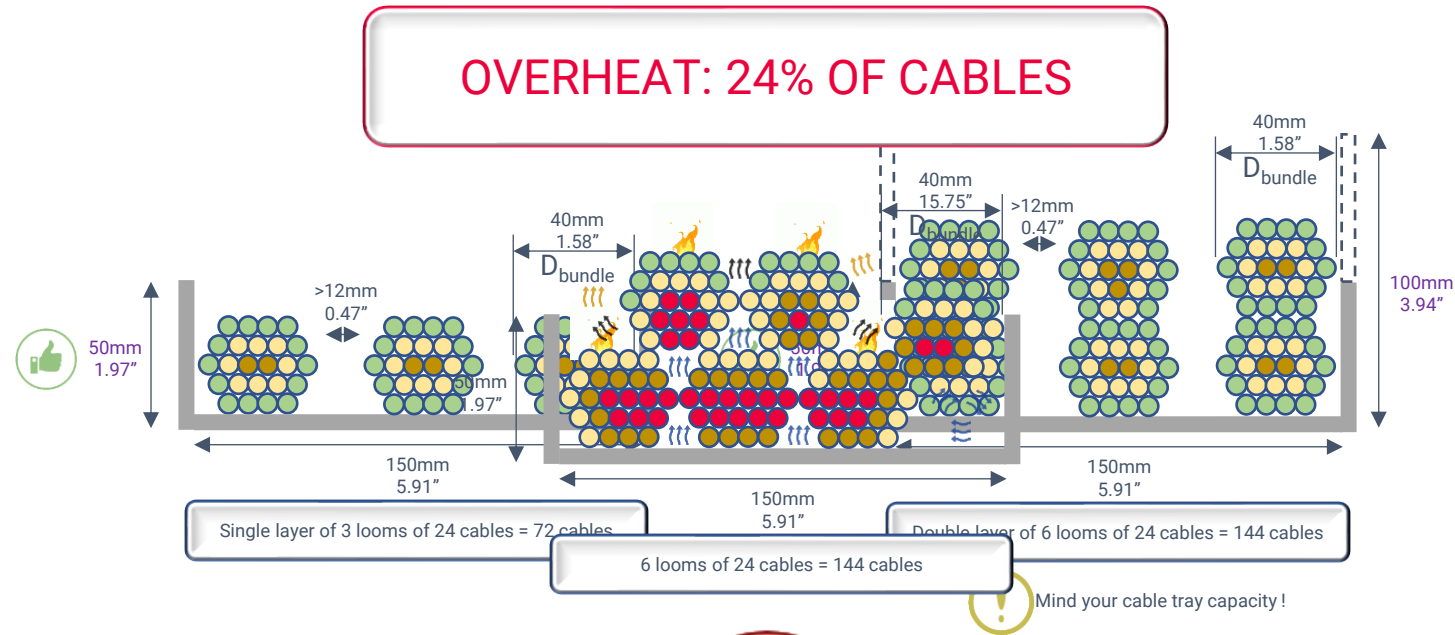
Stacking of looms must be undertaken in a manner that ensures the vertical air movement for convection cooling of cable looms

COMPLIANT



ISO/IEC TS 29125:2017
SA TS 29125:2019
TIA TSB-184-A:2017

Common Traps to Not Fall Into



COMPLIANT



ISO/IEC TS 29125:2017
SA TS 29125:2019
TIA TSB-184-A:2017



COMPLIANT



ISO/IEC TS 29125:2017
SA TS 29125:2019
TIA TSB-184-A:2017

Thank you

Trompie Du Raan

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Specialist, Molex Connected
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