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# CONTRIBUTION TO IEEE P802.3CY Insertion Loss MEASUREMENTS 26 AWG and 24 AWG STP CABLES

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Stefan Gianordoli / Jonathan Silvano de Sousa

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## Background and Motivation

- Currently presented results are so far based on AWG 26 (0.14mm<sup>2</sup>) cables.
- Length reduction has been proposed in order to make margin for high temperatures and aging effects\* under the newly proposed IL Limits\*\*.
- Our motivation is to investigate a larger STP cross-sections in order to improve overall IL performance to try to encompass aging and temp. effects.

\* [BergnerCuestaDiBiaso 3cy 01a 01 19 21](#) and [neulinger 3cy 01 12 15 20](#)

\*\* [Kadry 3cy 02 0820](#) and [sedarat 3cy 01 01 05 21](#)

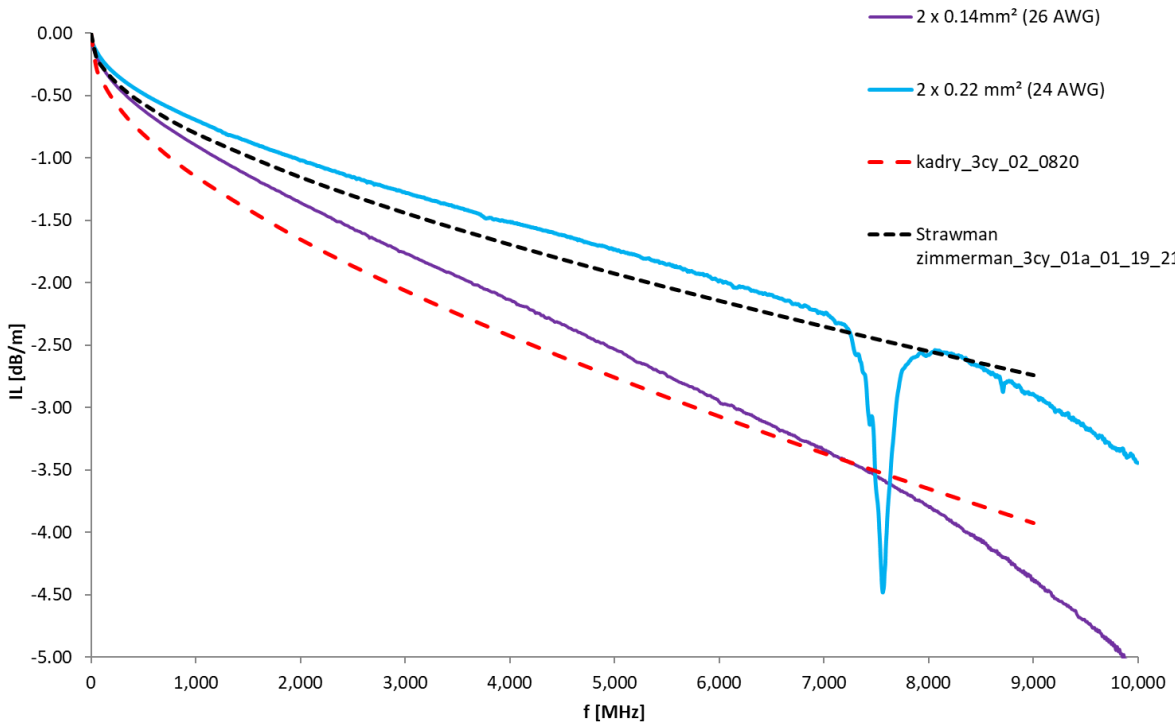


## Measured Cables

- Shielded Twisted Pair Cables (STP)
  - AWG24 (0,22mm<sup>2</sup>)
  - AWG26 (0,14mm<sup>2</sup>)
    - $Z = 100\Omega \pm 3\Omega$
    - Frequency range up to 7.5 GHz (due to suck out)
- Measurements performed
  - Room Temperature (RT) and at 105°C (0.5m out of heat chamber for contacting)
  - Sample length 10m
  - Measurement without Connector → with fixtures (losses included).



# Current STP Development: 26 AWG and 24 AWG (RT)



	26 AWG RT	24 AWG RT
<b>Kadry_3cy_03_0820</b>	Up to 7.5 GHz	Up to 7.0 GHz
<b>Strawman zimmerman_3cy_01a_01_19_21</b>	not ok	Up to 7.0 GHz

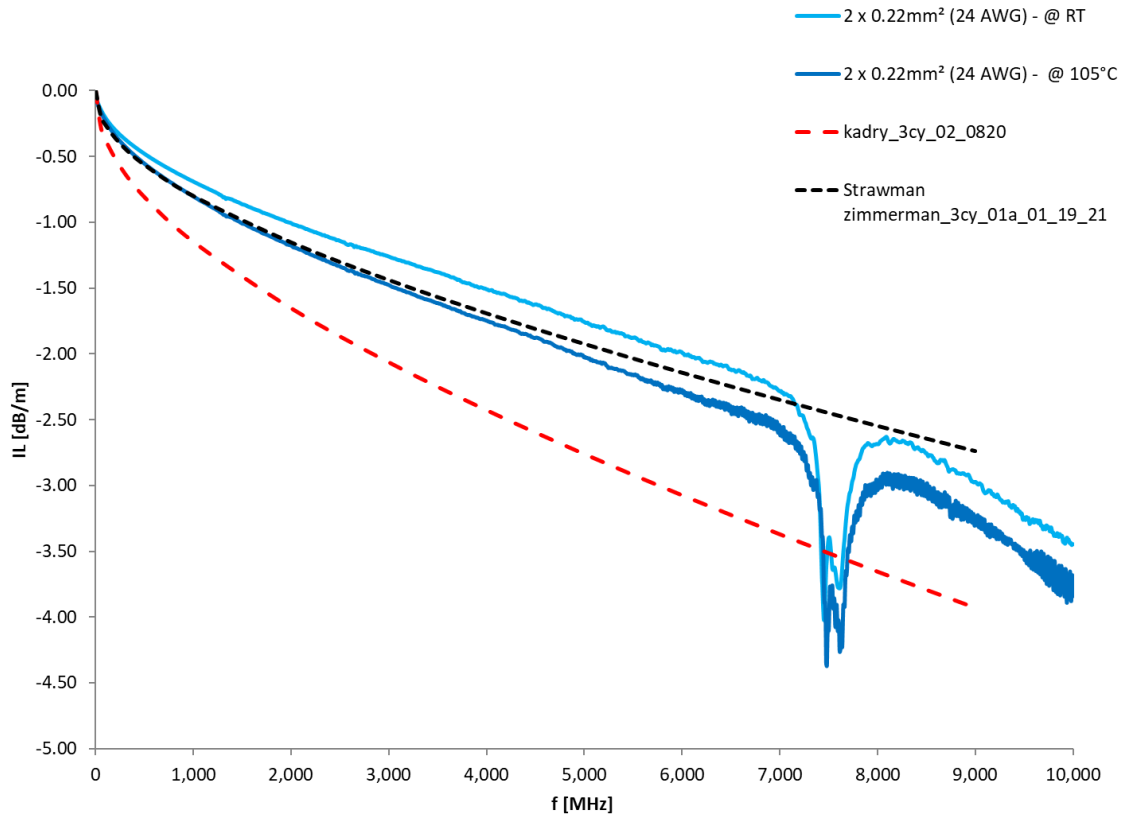
Distance to Kadry Proposal (baseline):

~ 1.0 dB/m @ 7 GHz (24 AWG)

~ 0.0 dB/m @ 7 GHz (26 AWG)



## Current STP Development: 24 AWG IL @ T=105°C



	24 AWG RT	24 AWG 105°C
Kadry_3cy_03_0820	Up to 7.0 GHz	Up to 7.0 GHz
Strawman zimmerman_3cy_01a_01_19_21	Up to 7.0 GHz	not ok

Slight decrease in performance as expected at 105°C (~0.25dB/m @ 7GHz).

But still above proposed limits:

~1.0 dB/m @ 7 GHz (RT) and

~0.75 db/m @ 7 GHz (105°C) above Kadry proposal.



## Summary

STP cables of different diameters (AWG24 and AWG26) were compared with proposed IL limits

A larger diameter STP cable (24 AWG) was introduced. It demonstrated better IL values in comparison with a thinner 26 AWG cable.

Up to 7 GHz the limits (Kadry) were met with the AWG 24 cable, even at 105°C. Due to a suck out at 7.5 GHz the limits were not met beyond 7 GHz.

Considerations about the right connector specification for this diameter must be done.

Further measurements and improvements are necessary, especially to move the suck-out beyond 9 GHz.