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

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# Background and Motivation

• Currently presented  results are so far based on AWG 26 (0.14mm²) cables.

• Length reduction has been proposed in order to make margin for high temperatures and aging effects* under the newly proposed IL Limits**.

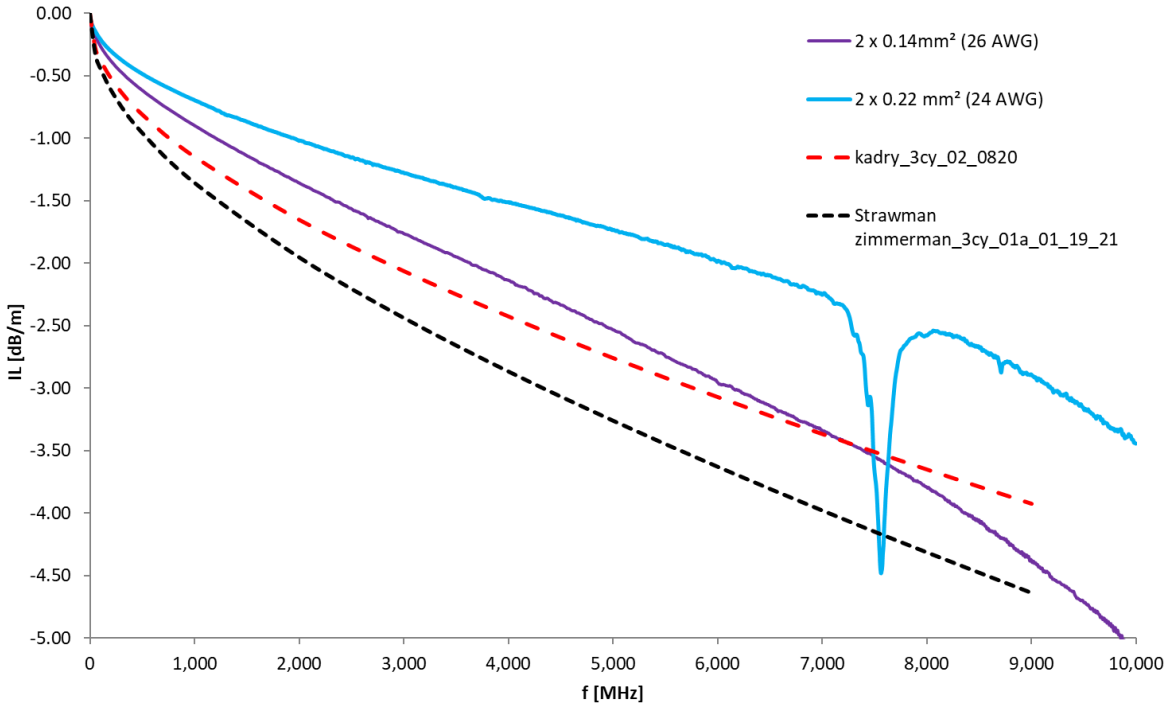
• Our motivation is to investigate a larger STP cross-sections in order to improve overall IL performance to try to encompass aging and temp. effects.

* 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 (0,14mm²)
  - AWG26 (0,22mm²)
    - Z = 100Ω +/- 3 Ω
    - 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)



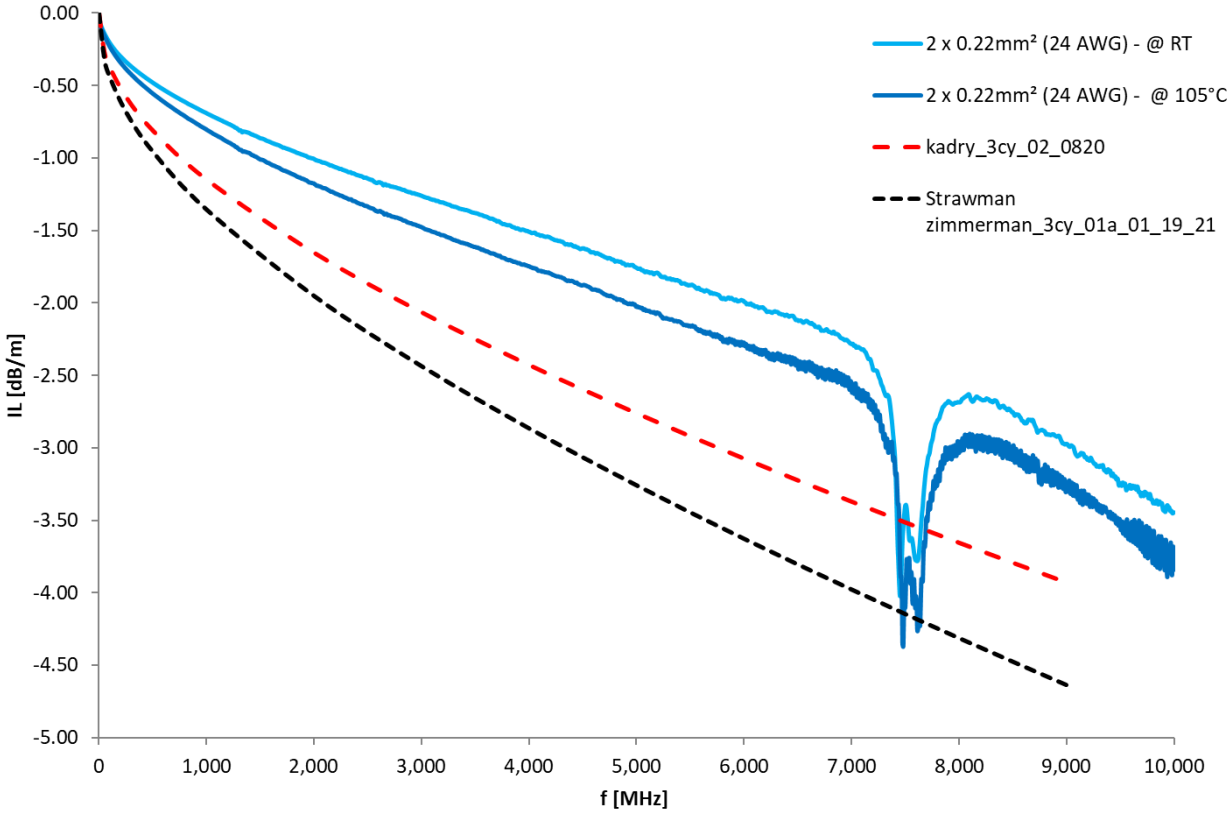

| | 26 AWG RT | 24 AWG RT |
|---|---|---|
| Kadry_3cy_03_0820 | Up to 7.5 GHz (suck out) | Up to 7.0 GHz |
| Strawman zimmerman_3cy_01a_01_19_21 | Up to 9.0 GHz | Up to 7.5 GHz (suck out) |

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 7.5 GHz (suck out) | Up to 7.5 GHz (suck out) |
| Strawman zimmerman_3cy_01a_01_19_21 | Up to 7.5 GHz (suck out) | Up to 7.5 GHz (suck out) |

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.

The AWG 26 cable could comply with Strawman Proposal (Zimmerman) up to 9.0GHz

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.