Open plan office acoustics: ISO 3382-3 and other approaches

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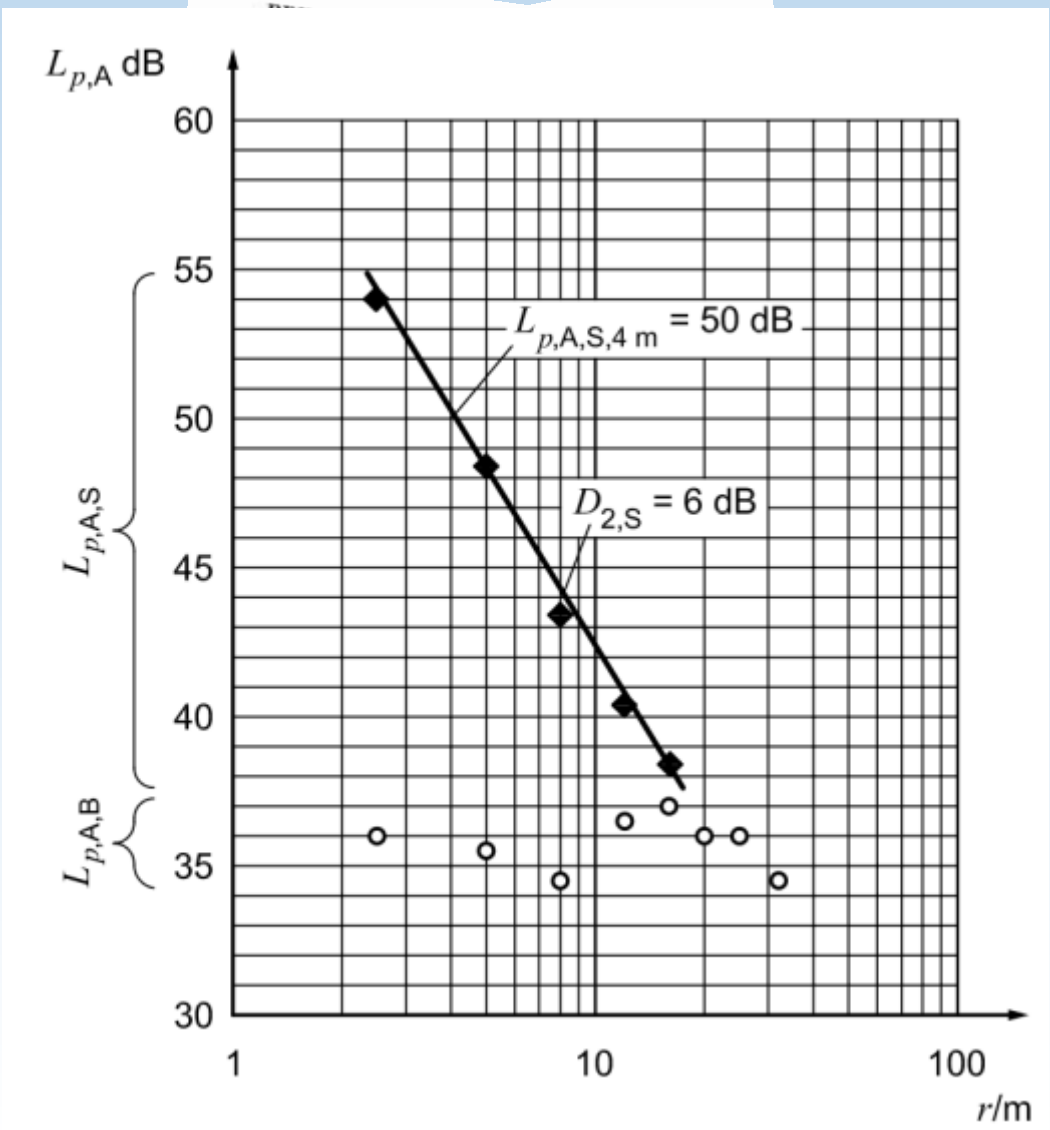
ATTMA

Contents

- ISO 3382-3: 2012 parameters
- Performance criteria
- Modelling and design guidance
- French NF S 31-199: 2016
- German VDI 2569: 2016 (Draft)

ISO 3382-3

- $D_{2,S}$
- $L_{p,A,S,4\ m}$
- STI
- $L_{p,B}$
- r_D



Criteria

New recommendations (Finnish Institute of Occupational Health, 2015)

Class	Level of speech privacy	$D_{2,S}$ [dB]	r_D [m]
A	Highest	>11	<5
B	...	9-11	5-8
C	...	7-9	8-11
D	...	5-7	11-15
E	Lowest	<5	>15

Virjonen P, Keränen J, Hongisto V. Determination of acoustical conditions in open-plan offices – proposal for new measurement method and target values. Acta Acustica United Acustica 2009;95(2):279–90.

Hongisto's design guidance

$$D_{2,S} = 8\frac{h}{H} + 0.16\frac{L}{H} + 4\alpha_c + 1.7\alpha_f$$

$$L_{A,S,4m} = L_{A,S,1m} - 3h - 0.1W - 4.6\alpha_c - 0.8\alpha_f$$

J. Keränen, V. Hongisto / Applied Acoustics 74 (2013) 1315–1325

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French NF S 31-199: 2016

- Previous Standard (NF S 31-080: 2006) does not differentiate between activity in different spaces
- Four space types, each with own criteria:
  - Activity on telephone
  - Involving collaborative work
  - Low level of collaborative work
  - Office work including receiving the public
- L_{Aeq}, D_n, $D_{2,S}$, RT

French criteria

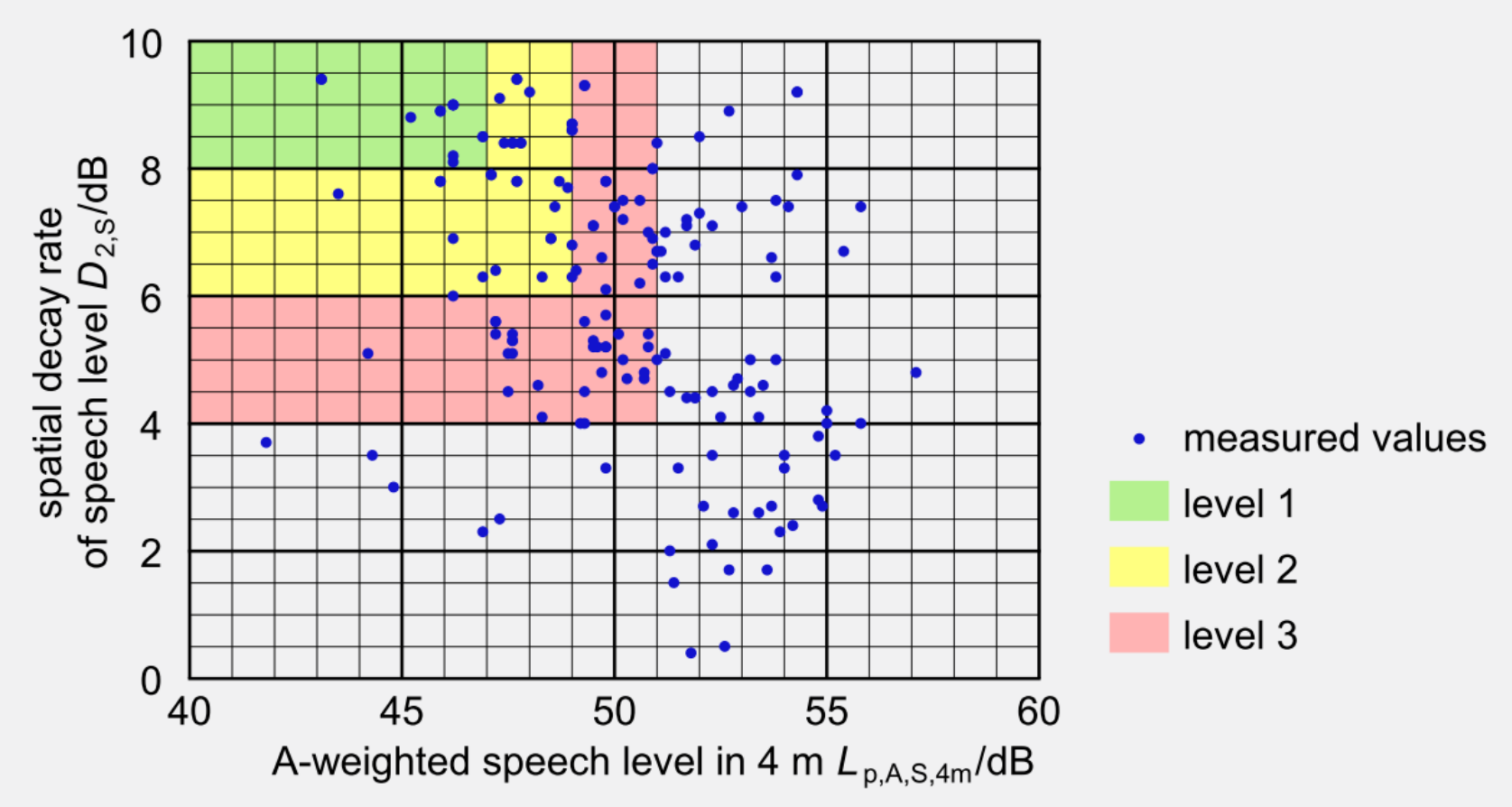
Space type	Target $L_{Aeq,\,T}$ / dB	Between workstations, D_n / dB	Spatial decay, $D_{2,S}$ / dB
Call centre	$48 < L_{Aeq,\,T} < 52$	≥ 6	> 7
Collaborative	$45 < L_{Aeq,\,T} < 50$	< 4	> 9
Non-collaborative	$40 < L_{Aeq,\,T} < 45$	≥ 6	> 7
Receiving public	$L_{Aeq,\,T} < 55$	≥ 6	$D_{nT,A} > 35$

German VDI 2569 *Draft*

- Individual offices, small rooms, large rooms
- Classification system: A, B, C

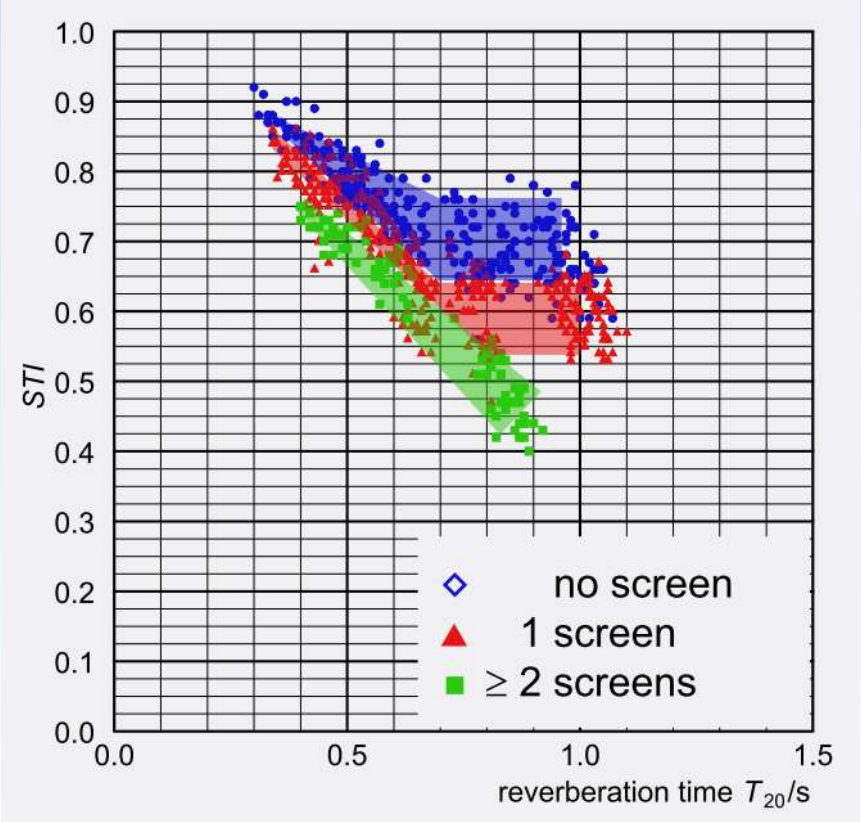
Level of sound attenuation	$D_{2,S}$	$L_{p,A,S,4m}$
1	≥ 8 dB	≤ 47 dB
2	≥ 6 dB	≤ 49 dB
3	≥ 4 dB	≤ 51 dB

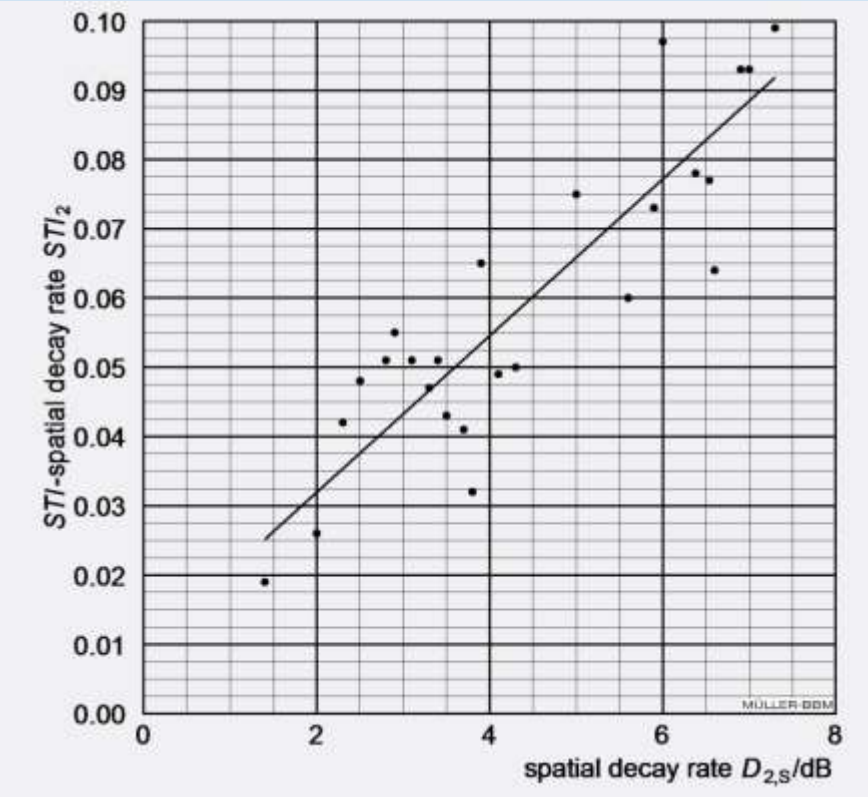
German VDI 2569



Source: Elmar Schroeder, EIAS 2015

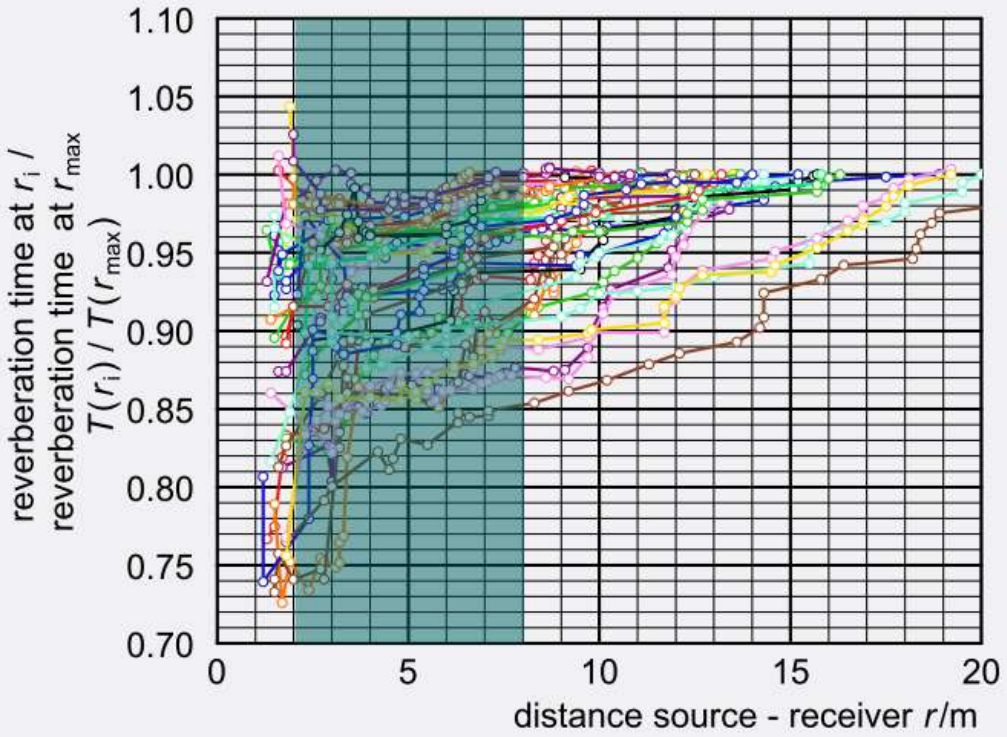
VDI 2659 – do not use STI





Source: [Elmar Schroeder, EIAS 2015]

Measure RT between 2 and 8 m



- T_{20} depends on distance
- The more screens the higher the $\Delta T(r)$

Source: Elmar Schroeder, EIAS 2015

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Conclusions

- ISO Standard defines parameters…
- …but not everyone agrees which ones to use
- No consensus on criteria!
- French standard: different use of spaces
- German standard: classification system
- Join the Room Acoustics group!

Thank you for listening

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