

NEN2575:2012 part 2: Relevant parts which deal with the speaker projection in defined standard rooms.

4.2 Performance requirement for noise intensity level for broadcast messages

The noise intensity level of broadcast messages must stay within the threshold values contained in Table 1 throughout the entire evacuation area.

The noise intensity levels must be measured as per Annex C.

Table 1 — Threshold values for the noise intensity level of broadcast messages

	Room function	Noise intensity level <small>L_{A,eq}^a</small>
Minimum noise intensity level required	General	60 dB(A) ^d
	In bedrooms at the top end of each bed ^b	70 dB(A)
Maximum noise intensity level permitted	General	105 dB(A)
	In sleeping area ^b	85 dB(A)
Minimum difference between the noise intensity level of the broadcast message and the equivalent ambient noise (L _{A,eq})	Everywhere ^c	+6 dB(A)
^a How to measure the noise intensity level of the broadcast message is described in Annex C. ^b This requirement only applies with regard to people who are not dependent on others. Please refer to NEN 2575-1 Annex B for user functions with those who are dependent on others. ^c Annex D contains the typical noise intensity levels of the expected equivalent ambient noise intensity levels for a number of building types. When using this Annex, it must be kept in mind that this information is a guideline and that the noise intensity level of the ambient noise could vary markedly from building to building. ^d If different languages are involved, each language must meet the requirements.		

NOTE The maximum value for broadcast messages has been set to allow for speech quality. There is a risk that the text may become incomprehensible at higher noise intensity levels, partly because people would cover their ears. At higher noise intensity levels communication is impaired between rescue workers as well, for example.

Channel selectors, volume and tone controls and so on – or combinations thereof – must not have any effect on the programmed settings of the noise intensity level of the evacuation signal.

4.3 Performance requirement for the speech quality of spoken messages

4.3.1 General requirement for speech quality

A spoken message must be properly audible throughout the whole evacuation area by people who have average hearing.

All the prerecorded messages must be clear, concise and uniform. The messages must be properly articulated and the rate of speech must be relatively slow.

NOTE Point 6.2.2 states how the tone signals combined with the spoken message should be broadcast. If necessary, the spoken messages can be broadcast in another language (e.g. English, German and/or French). The details must be set out by the person who draws up the PoR.

The text below is an example of a spoken message in emergency situations.

- *Attention, you must immediately leave the building via the marked emergency exits.
Do not use the elevators.*

The text below is an example of a spoken message during an evacuation drill.

- *Your attention please!
An evacuation drill in coordination with the fire department is in progress. Please stay calm and leave the building as quickly as you can. Thank you for cooperating.*

4.3.2 Performance requirement for speech quality

The performance requirement for speech quality is measured by the quality of the broadcast speech or the 'Speech Transmission Index' (STI), determined in line with NEN-EN-IEC 60268-16. In view of its practical applicability, the STIPA method for measuring is the most suitable.

In at least 90 % of the evacuation area and in every room located within the evacuation area that has a floor area of more than 10 m², the STI must fall within the threshold values set out below in Table 2.

Table 2 — Threshold values for speech transmission quality

	Threshold values	
	Average value measured across all rooms located within an evacuation area	Minimum value per room located within an evacuation area
STI	0.5	0.45
NOTE How to determine the STI value is described in Annex C.		

NOTE The values shown in Table 2 relate to the minimum values at which adequate speech quality is still achieved. In extremely cavernous areas such as stations and tunnels and areas where there is a high level of ambient noise these values may not be possible to achieve. In these situations, an equivalent safety level has to be determined for such areas beforehand in consultation with the relevant parties.

15.5 Speaker projection guideline

15.5.1 General

The evacuation alarm system must comply with the performance requirements as described in chapter 4. If the area meets the following requirements:

- It is a standard area as described in 15.5.2;
- There is a loudspeaker in the area;
- Projection is in line with this chapter;
- The speakers used comply with 15.5.4,

and complies with the other conditions contained in 15.5, the performance requirements described in 4.2 and 4.3 are complied with and there is then no need to carry out sound measurements.

Sound measurements must be carried out if the performance requirements are deviated from for justifiable reasons.

NOTE In extremely cavernous areas and areas where there is a high level of ambient noise the performance requirements may not be achievable. In these situations, an equivalent safety level has to be determined for such areas beforehand in consultation with the relevant parties.

15.5.2 Standard area

To comply with the projection guidelines, the area must match the criteria for a standard area.

A standard area must meet the following four requirements:

- 1) It must have a maximum height of 4 m, and
- 2) Must not have an ambient noise level in excess of 54 dB(A) for type A evacuation systems (see Table D.1), and
- 3) Must have an echo time of < 1.0 s, and
- 4) Must not have any obstacles as described in 15.5.3.

15.5.3 Obstacles in an area

If obstacles are present in an area and all three conditions are present simultaneously, it cannot be classified as a standard area and sound measurements have to be carried out to demonstrate that the performance requirement is met.

It is not a standard area if:

- There is an obstacle that exceeds 2 m in height, measured from the floor, and
- The free space between the obstacle and the ceiling is less than 1 m, and
- The area covered by the obstacles present occupies more than 30 % of the floor area.

15.5.4 Loudspeaker specifications

The loudspeaker must be set to have a noise intensity level of at least 84 dB(A) at 1 kHz at 1 m from the loudspeaker.

15.5.5 Distribution of the loudspeakers and maximum coverage by each loudspeaker

These projection requirements apply for standard areas (see 15.5.2).

An adequate number of loudspeakers must be placed in each room to ensure that the performance requirement is met. In terms of projection this means:

- That the maximum coverage per loudspeaker is 80 m²
- That the maximum horizontal distance (D) of 6.7 m from a loudspeaker to any point on the ceiling is not exceeded;
- That a loudspeaker has to be attached at a height of at least 1.5 m, measured from the floor.

15.5.6 Passageways

In areas that have a width of a maximum of 3 m, the maximum for distance D can be extended to 7.5 m.

15.5.7 Storerooms

In storerooms that have a surface area of no more than 8 m² there is no need to install a loudspeaker. The condition, however, is that a loudspeaker must be placed directly in line with the access door at a maximum distance of 1.5 m. The loudspeaker must be set so that the noise intensity level is at least 90 dB(A) at 1 m from the speaker.

15.5.8 Cloakroom facilities

Cloakroom areas such as showers and toilet areas do not have to be equipped with a loudspeaker. The condition, however, is that a loudspeaker has to be installed in the front area of the cloakroom.

If the cloakroom does not have a front area a loudspeaker must be placed directly in line with the access door at a maximum distance of 1.5 m. The speaker must be set so that the noise intensity level is at least 90 dB(A) at 1 kHz at 1 m from the speaker.

15.5.9 Shafts

In accessible shafts where work may be carried out behind a closed door one loudspeaker for the floor adjacent to the access door must be placed in the shaft per adjoining floor. In zones with alarms that extend over multiple floors, one loudspeaker per alarm zone is adequate if the flooring in the shafts is at least 70% open. The openings in grid flooring can be included in this 70%. Distance D may not exceed 7.5 m measured both horizontally and vertically.

15.5.10 Elevators

Elevators and elevator shafts do not have to be fitted with a loudspeaker.

15.5.11 Bedrooms

Each bedroom must have at least one loudspeaker.