

4. CONCLUSIONS

In this study, noise measurements taken from the weaving division and dyeing/finishing division in a textile plant were evaluated. In the light of the evaluations, the following conclusions were reached.

- a) The noise levels ranged from 99.2 dBA to 101.1 dBA in the weaving division, while in the dyeing/finishing division it ranged from 77.1 dBA to 79.3 dBA.
- b) Personnel working in the dyeing/finishing division are not required to use personal protective equipment.
- c) Personnel working in the weaving division, on the other hand, can only work for a maximum of 12 minutes without ear protectors in accordance with the relevant regulation. After this period, they should wear hearing protectors.
- d) The dominant frequencies of noise to which the staff working in the textile plant are exposed to are lower than 4000 Hz, which the ear is the most sensitive.
- e) Every effort should be made to reduce the noise level at its source in the weaving division. But, all ways to separate people from potentially damaging causes of noise are exhausted, workers must be provided with the correct personal hearing protectors. It must be noted that this equipment can be used as a temporary measure or the last resort.
- f) The noise level in the weaving division is higher than 85 dBA, which is the highest exposure action value specified in the relevant regulation. Employees may experience hearing loss, hearing-related health problems and loss of productivity at work.

Table 2. Noise parameters for the textile plant

| Division | Round of measurement | Average time mm:ss | Filter detector | L _{peak} (dB) | L _{max} (dB) | L _{min} (dB) | SPL (dB) | L _{eq} (dB) | SEL (dB) | L ₁₀ (dBA) | L ₅₀ (dBA) | L ₉₀ (dBA) | L _{EX,8h} (dBA) | Working time (h) | Dominant frequency range (Hz) |
|-------------------------|----------------------|--------------------|-----------------|------------------------|-----------------------|-----------------------|----------|----------------------|----------|-----------------------|-----------------------|-----------------------|--------------------------|------------------|-------------------------------|
| Dyeing/finishing | 1 | 05:04 | A, Fast | 102.2 | 88.4 | 77.2 | 79.2 | 79.5 | 104.4 | 81.4 | 78.5 | 77.6 | 79.3 | <24.0 | 400-1250 |
| | | | C, Fast | 103.0 | 91.5 | 82.6 | 84.0 | 84.9 | 109.7 | 86.3 | 84.4 | 83.2 | 84.6 | | |
| | | | Z, Fast | 102.8 | 91.6 | 83.2 | 84.6 | 85.4 | 110.3 | 86.8 | 85.0 | 83.9 | 85.2 | | |
| | 2 | 05:27 | A, Fast | 103.5 | 92.4 | 73.5 | 75.5 | 77.4 | 102.5 | 79.5 | 75.6 | 74.2 | 77.1 | | |
| | | | C, Fast | 106.2 | 94.5 | 79.6 | 81.8 | 82.7 | 107.8 | 84.1 | 81.8 | 80.5 | 82.4 | | |
| | | | Z, Fast | 106.9 | 94.7 | 80.3 | 82.3 | 83.4 | 108.5 | 84.7 | 82.7 | 81.3 | 83.1 | | |
| | 3 | 05:06 | A, Fast | 99.3 | 86.7 | 74.8 | 76.8 | 77.5 | 102.3 | 79.4 | 76.6 | 75.4 | 77.3 | | |
| | | | C, Fast | 102.9 | 90.6 | 80.9 | 83.0 | 83.4 | 108.3 | 84.8 | 83.1 | 82.0 | 83.2 | | |
| | | | Z, Fast | 104.0 | 91.1 | 81.7 | 83.9 | 84.3 | 109.2 | 85.7 | 84.0 | 82.8 | 84.1 | | |
| | 4 | 05:04 | A, Fast | 106.0 | 93.3 | 74.8 | 76.7 | 77.5 | 102.3 | 78.2 | 76.9 | 76.0 | 77.2 | | |
| | | | C, Fast | 108.0 | 94.9 | 80.9 | 83.0 | 83.0 | 107.8 | 83.9 | 82.7 | 81.6 | 82.7 | | |
| | | | Z, Fast | 108.0 | 95.0 | 81.6 | 84.3 | 84.0 | 108.8 | 85.2 | 83.7 | 82.4 | 83.7 | | |
| Weaving | 1 | 05:05 | A, Fast | 114.7 | 100.3 | 98.5 | 99.5 | 99.5 | 124.3 | 99.9 | 99.5 | 99.0 | 99.2 | 0.3 | 1000 |
| | | | C, Fast | 115.3 | 101.6 | 99.8 | 100.7 | 100.7 | 125.5 | 101.4 | 100.6 | 100.0 | 100.4 | | |
| | | | Z, Fast | 115.7 | 101.8 | 100.0 | 100.9 | 100.9 | 125.8 | 101.7 | 100.8 | 100.1 | 100.6 | | |
| | 2 | 05:06 | A, Fast | 114.7 | 101.3 | 99.6 | 100.8 | 100.4 | 125.3 | 100.9 | 100.4 | 100.0 | 100.1 | | |
| | | | C, Fast | 115.7 | 102.8 | 100.6 | 102.0 | 101.7 | 126.6 | 102.5 | 101.6 | 101.0 | 101.4 | | |
| | | | Z, Fast | 116.1 | 103.0 | 100.8 | 102.2 | 101.9 | 126.8 | 102.7 | 101.8 | 101.1 | 101.6 | | |
| | 3 | 05:04 | A, Fast | 116.9 | 102.8 | 100.0 | 101.1 | 101.4 | 126.3 | 102.2 | 101.4 | 100.5 | 101.1 | | |
| | | | C, Fast | 117.7 | 105.0 | 101.4 | 102.6 | 103.1 | 127.9 | 103.9 | 103.1 | 102.1 | 102.8 | | |
| | | | Z, Fast | 118.4 | 105.2 | 101.7 | 102.9 | 103.4 | 128.2 | 104.3 | 103.4 | 102.3 | 103.1 | | |

NOMENCLATURE

- dB** : A relative unit of measure widely used in acoustics, electronics and communications.
- dBA** : A voice evaluation unit in which the human ear is particularly sensitive to medium and high frequencies.
- dBC** : A voice evaluation unit that correlates better with the human response to high noise levels.
- dBZ** : A voice evaluation unit implying no weighting (zero-frequency weighting) across the audio spectrum.
- L_{EX, 8h}** : The sound exposure averaged over 8 hours ($L_{EP,d}$)
- L_{max}** : Maximum sound level
- L_{min}** : Minimum sound level
- L_{peak}** : Peak sound pressure
- SPL** : Sound pressure level
- L_{eq}** : Equivalent sound level
- SEL** : Sound exposure level
- L₁₀** : The noise level just exceeded for 10% of the measurement period
- L₅₀** : The noise level just exceeded for 50% of the measurement period
- L₉₀** : The noise level just exceeded for 90% of the measurement period

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