



# Benson Aluminum Dynamics

## Noise Pollution from Aluminum Recycling

### How Noise and Sound Impact Human Health

- By definition: **Noise** is unwanted or disturbing sound<sup>1</sup>
- Once noise becomes persistent and increasing in levels (over **70 decibels**), severe health consequences can develop.
- These can include: hearing loss, sleep disturbance, stress, mental health, cognitive impairment<sup>1</sup>



#### Decibals (dB)

- Noise becomes harmful when it exceeds 70 dB and can be painful above 120 dB<sup>9</sup>

#### Sleep Disturbance

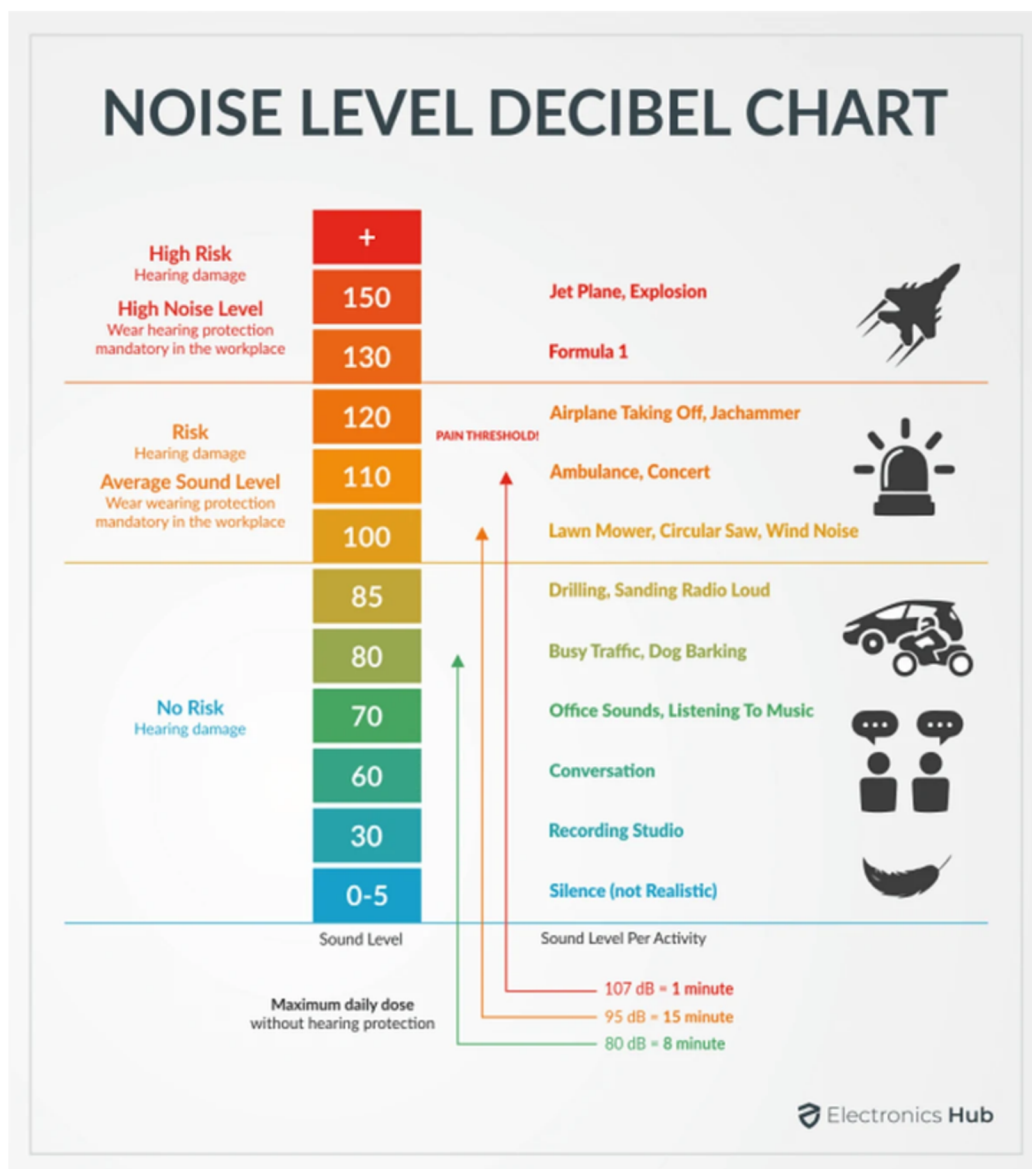
- According to Iberdrola (renewable energy company), restful sleep is impossible with nighttime ambient noise levels in excess of 30 dB<sup>9</sup>

#### Hearing Loss

- One major factor in developing hearing loss is having constant exposure to hazardous noise that's typically above 70 dB<sup>2</sup>
- Research states that over 12 million people in the U.S live near areas of outdoor noise that exceed the threshold of 70 dB continuously<sup>2</sup>

#### Mental Health

- Individuals exposed to long periods of noise are more likely to respond in anger, irritation, and/or emotional stress<sup>2</sup>
- Over time, the listed symptoms (above) can contribute to mental fatigue and impact work performance<sup>2</sup>



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SWEHSC (P30 ES006694) is funded by the National Institute of Environmental Health Sciences



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## Noise Pollution from Aluminum Recycling

### How Aluminum Recycling Machines Create Noise Pollution

- Typically, recycling centers need to have balers, hydraulic shredders, and hammer mills (heavy duty grinders).
- Research indicated that the shredder would **generate noise levels up to 82 dBA at a distance of 180-200 ft** <sup>4</sup>

### Top 2 Machines Used for Aluminum Recycling (According to Draft Permit from ADEQ)<sup>7</sup>



*Industrial Melting Furnace*<sup>6</sup>

The noise level of a melting furnace can vary widely depending on its size, type, and operating conditions. Large - scale melting furnaces, such as those used in steel mills, **can generate noise levels exceeding 90 dB.**<sup>5</sup>



*Heavy Truck*<sup>8</sup>

71 trucks are expected as transportation for the aluminum recycling on a daily basis.<sup>7</sup> Trucks (especially heavy) can **emit noise in the range of 90-96 dB**<sup>8</sup>



## References

1. "Noise Effects Handbook." NPC Library: Noise Effects Handbook,
2. "Noise Control for a Metal Shredder and Recycling System". Saxelby, L. A. (n.d.).
3. "What Is the Noise Level of a Melting Furnace? - Blog." Zibo Jimeng Environmental Protection Equipment Co., Ltd.
4. "Products-Melting Furnace." Hertwich.
5. AQD | Aluminum Dynamics, inc. | adeq. Arizona Department of Environmental Quality. (n.d.).
6. "Noise pollution: By the decibels: Clean charge network." Plug-In KC + Clean Charge Network.



*Shredder System*<sup>4</sup>

Measurements taken for a 2012 study conducted showed that a 60-inch-by-60-inch shredder with a 1,000-horsepower electric motor created noise **levels of up to 123 dB**<sup>4</sup>