Whitepaper

Jabra GN

Jabra SafeTone™

Ensuring hearing safety and well-being for headset users

GN Making Life Sound Better
FOR 150 YEARS

Jabra SafeTone™ - Noise protection

At Jabra, we are committed to making life sound better but are also dedicated to ensuring that our users are offered the highest level of hearing protection.

Headsets are designed not only for sound quality and comfort, but also to protect the hearing of those who use them. This white paper discusses the sound challenges faced by headset users; the various standards and regulations that apply; and the protection offered by Jabra headsets, audio enhancers, USB adapters and other solutions with built-in SafeTone protection.

Noise protection

People using headsets for many hours each day face two potential hazards:

Sudden loud sounds

Sudden, very loud sounds from the headset can be caused by disruptions in the telephone and communication network. Using a headset that lacks appropriate hearing protection leaves users vulnerable to acoustic shock; this can be very disturbing and can even affect their hearing.

High average noise level

Contact center and office headset users particularly may experience volume levels when on calls that are too high over the course of a working day, and can suffer fatigue and stress as a result. This can impact productivity and engagement.

All Jabra products meet legal requirements

All Jabra headsets for consumer or enterprise use meet legal requirements from national authorities and health authorities, as well as recommendations from telecommunications specialists related to harmful sound spikes and maximum acoustic output. Experienced acoustic experts from Jabra play an active role in acoustic safety specification work in international standardization organizations, such as the International Telecommunication Standardization Sector (ITU-T) and the European Telecommunications Standards Institute (ETSI).

Examples	Sound pressure level (DB)
Jet aircraft, 50 m away	140
Threshold of pain	130
Threshold of discomfort	120
Chainsaw, 1 m distance	110
Disco, 1 m from speaker	100
Diesel truck, 10 m away	90
Kerbside, 5 m away from busy road	80
Busy call center	70
Typical open office	60
Average home	50
Quiet library	40
Quiet bedroom at night	30
Background in tv studio	20
Rustling leaf	10
Threshold of hearing	0

Fig 1: Typical sound levels from familiar sources.

Jabra SafeTone - Active hearing protection for headset users

Jabra SafeTone = Jabra PeakStop™ + Jabra IntelliTone™

Jabra delivers headsets, audio enhancers, USB adapters and other solutions that protect the hearing and comfort of headset users by eliminating sudden high levels of noise and preventing volume levels from being too high throughout the working day.

PeakStop

Active removal of sudden loud sounds

All Jabra headsets come with PeakStop technology that eliminates potentially harmful sound spikes. Based on an electronic gateway or transistor that reacts instantly, PeakStop actively protects the user by keeping the absolute sound level and the energy of the peak in the safe zone at all times, thus preventing potentially harmful sound from reaching the ear.

Fig. 2: PeakStop continuously monitors the sound flow and actively reduces critical sound peaks to a safe level.

Absolute peak value

Jabra headsets operate well within global requirements for sound level exposure known as 'instantaneous maximum level in absolute peak value'.

Absolute peak value is the maximum level of sound that the earphone or receiver can deliver to the ear. Internationally, 140 dB(C) is accepted as the absolute peak value limit that the ear should be exposed to. All Jabra headsets conform to a maximum of 122 dB absolute peak value, which is significantly below the international standard.

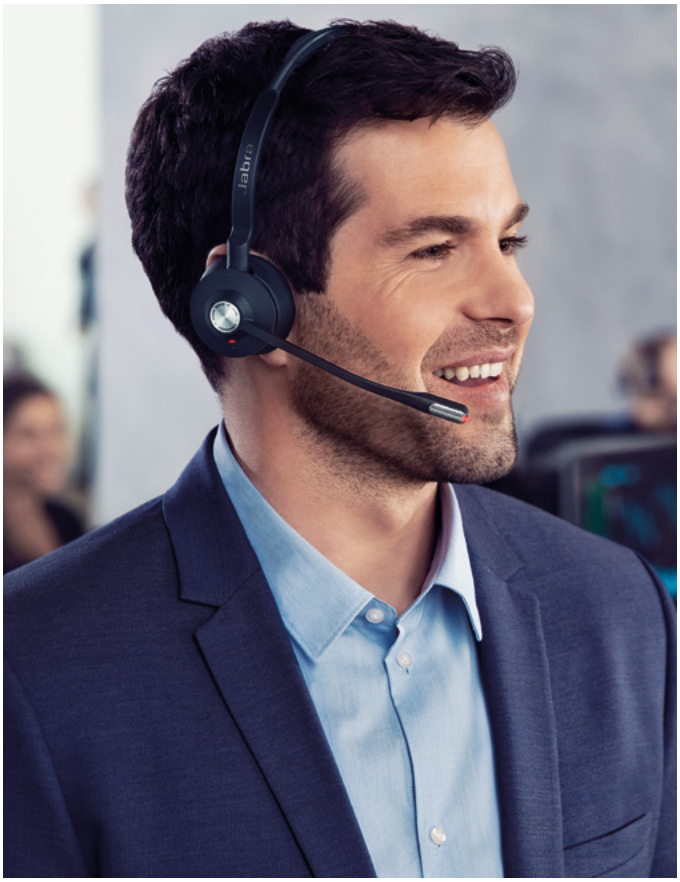
Fig. 3: International and Jabra accepted peak values

RMS value

RMS stands for 'Root Mean Square', an expression of the effective energy in the sound waves. The RMS value is used to define a standard for continuous sound as opposed to sudden sound peaks.

Leading EU and US authorities agree that 118 dB (RMS value) should be the maximum level for total sound exposure from a continuous sound. Built-in PeakStop technology means that all Jabra headsets meet this requirement limit.

Fig. 4: International and Jabra accepted peak value



IntelliTone

Keeping average noise exposure at a safe level

IntelliTone is there to ensure that the average sound level you're exposed to during your work day is at a comfortable level that protects your hearing. Jabra enterprise headsets, audio enhancers, USB adapters and other solutions with IntelliTone let you intelligently adjust the average sound level down to 85 dB over the course of your working day, which will then enforce for example the EU Noise at work directive 2003/10/EC.

Protection level	Criteria
Level 0 (default)	Basic Protection (over 118dB(A))
Level 1	Less than 4 hours on phone/day
Level 2	4-8 hours on phone/day
Level 3	More than 8 hours on phone/day
Level 4 (G616)	Recommended Australian protection level

SafeTone

Jabra enterprise products with built-in SafeTone hearing protection offer PeakStop and IntelliTone technology, enabling the user to find a comfortable level that ensures maximum benefit from the headset while ensuring a safe listening level.

The next generation of hearing protection: Jabra SafeTone 2.0

To ensure the highest level of hearing safety and wellbeing of headset users, we have developed the next advance in SafeTone technology, called SafeTone 2.0, which is offered in the latest Jabra solutions*.

PeakStop 105 dB (RMS)

If you use your headset intensively, it's important to protect your hearing and avoid the discomfort caused by sudden spikes. That's why we've developed the next generation of PeakStop, which cuts off sudden sound spikes at 105 dB (RMS), compared to the regular Jabra PeakStop, which cuts off at 118 dB (RMS).

Intelligent acoustic shock protection

Acoustic shock can be uncomfortable and, in some cases, harmful, and should be avoided in order to prevent damage to hearing. When a traditional acoustic shock protection system identifies potentially harmful sound levels, all sounds, including the conversation, are reduced or removed. This can lead to the volume being too low in your conversations.

With intelligent acoustic shock protection, potentially harmful sounds are analyzed, and then removed or reduced without affecting the ongoing conversation, giving you the best conditions to deliver superior customer satisfaction over the phone.

Speech level normalization

To keep your sound level comfortable and consistent throughout the day, we've developed speech level normalization. Simply customize the sound level to your preferences, anywhere between 65 and 88 dB, and every call will be initiated at the predefined sound level.

Research shows that users often turn up the volume for a quieter incoming call, and forget to turn it down again, thereby being exposed to unnecessary high volumes, which can potentially damage the hearing. Speech level normalization protects your hearing by ensuring that every call is initiated at the preferred sound level.

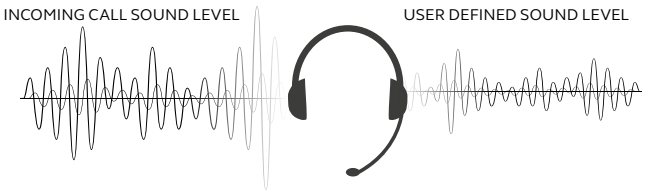


Fig. 5: Speaker software powers all incoming calls to a user-defined sound level

BalancedVoice™

In noisy office environments, users are more likely to increase the volume on calls to be able to hear the customer. These persistently high volumes can have a negative effect on their hearing. With BalancedVoice, the incoming sound on a call is processed to be crisper and clearer without increasing the sound level, reducing the likelihood of hearing damage from high volumes over a sustained period of time.

The positive effect of BalancedVoice has been tested and verified by Fraunhofer, an independent test lab. According to the test lab, 72% of users preferred to use BalancedVoice.

IntelliTone 2.0

The incoming sound is adjusted intelligently throughout the day, to keep the average sound level below a set of predefined parameters. Continuous monitoring and prediction of potential future sound levels allows the average sound level to be regularly adjusted. This provides a more consistent and vibrant sound level throughout the day compared to the standard IntelliTone implementation.

*Depending on solution, all or selected SafeTone 2.0 features are included.

Standards and regulations

Exposure to noise levels much lower than defined maximum peak value limits can also affect your hearing, if the exposure time is long enough.

It is important to differentiate between instantaneous peak levels, and the long-term effect of the time-weighted average exposure. The latter is measured over an 8-hour workday. The term 'average' is important. A worker can be exposed to an average of 90dB for 1 hour every day with peak levels at 100dB without any problems, providing they spend the remaining part of the day in an office with an average noise level of e.g. 75 dB.

The EU Noise at work directive 2003/10/EC enforces an upper max exposure limit of 87 dB(A) (time weighted average over a full working day). Leading US authorities recommend that the time-weighted average exposure limit for a working day should not exceed 85 dB(A) (time-weighted average over a full working day).

According to the EU regulation, the upper exposure action value is also defined at 85 dB(A). If the upper exposure action value of e.g. 85dB(A) is exceeded, instant action must be taken.

In a contact center, this could be done by providing the agent with a headset amplifier designed to ensure maximum average exposure is below 85 dB(A) from the headset.

The mandatory regulatory requirements in Australia for telecommunications equipment can be found in AS/CA S004. This follows the international guidelines for maximum sound pressure levels: 118 dBA SPL (RMS) at ERP. And 123 dB SPL peak at ERP.

Australian research and standardization work within audio and telecommunication has focused a lot on avoiding hearing damage. This has – besides the regulatory requirements – led to publication Industry Guideline G616. The guideline does not provide any mandatory requirements. As such, compliance with G616 cannot be claimed, as it is only providing guidance and is not a Standard.

The publication describes guidelines and test specifications for telecommunication equipment that further protect the health and safety of persons. In the case of headsets, the publication recommends an Acoustic Shock Protective Device Limit at 102 dB SPL RMS measured at DRP for all frequencies.

Active in international standardization

Jabra is an active partner in the international standardization of acoustic safety in telecommunication equipment.

Our experienced acoustic experts are invited by international standardization organizations such as the International Telecommunication Standardization Sector (ITU-T) and the European Telecommunications Standards Institute (ETSI) to participate actively in acoustic safety specification work.

Our participation helps to ensure that pertinent requirements serve and protect headset users and correspond to recommendations agreed upon by health authorities and hearing experts.

Jabra enterprise solutions comply with – and often surpass – the strictest regulations and standards in the world.

About Jabra

Jabra offers a wide range of headsets specifically engineered for workers who talk to customers on the phone for large parts of their day.

The headsets boast innovative technologies that deliver superior-quality conversations, all-day comfort and help make busy work environments safer.

Jabra.com

Find out more

Different working environments demand different hearing protection solutions.

The Jabra range of headsets and key accessories for Contact Centers and Offices offers a wide choice of hearing protection technology covering virtually any requirement.
To find out more about which Jabra solutions and hearing protection technologies are relevant for specific working environments, please contact your Jabra account manager or visit Jabra.com.

For more information about noise at work regulations and directives, please visit these web sites:

Jabra enterprise product portfolio and hearing protection levels:
http://www.jabra.com/hearingprotection

European Agency for Safety and Health at Work:
http://osha.europa.eu/en/publications/magazine/8

An introduction to noise at work:
http://osha.europa.eu/en/publications/factsheets/56

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