

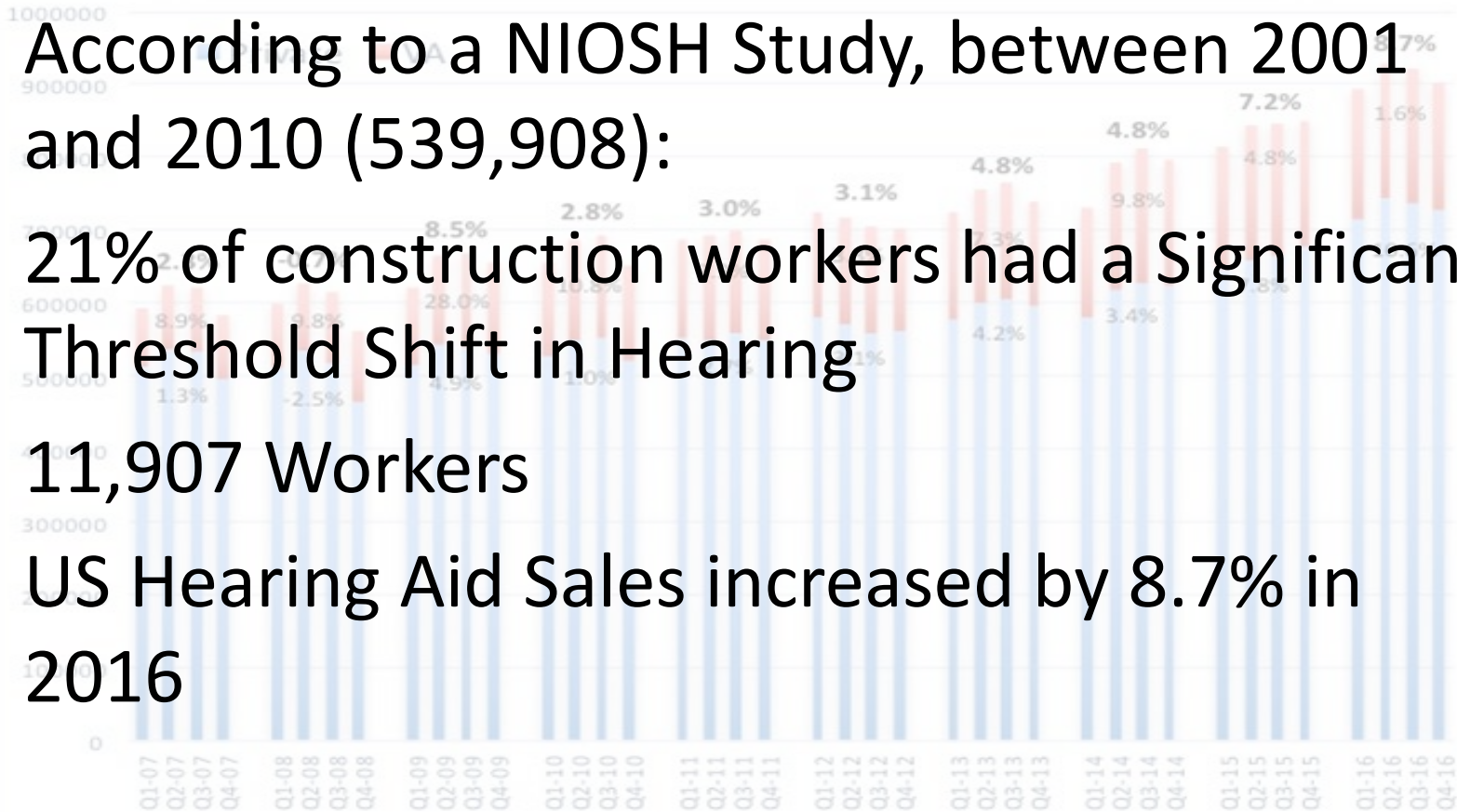
Noise Reduction Rating

NRR



Stats

- According to a NIOSH Study, between 2001 and 2010 (539,908):
- 21% of construction workers had a Significant Threshold Shift in Hearing
- 11,907 Workers
- US Hearing Aid Sales increased by 8.7% in 2016

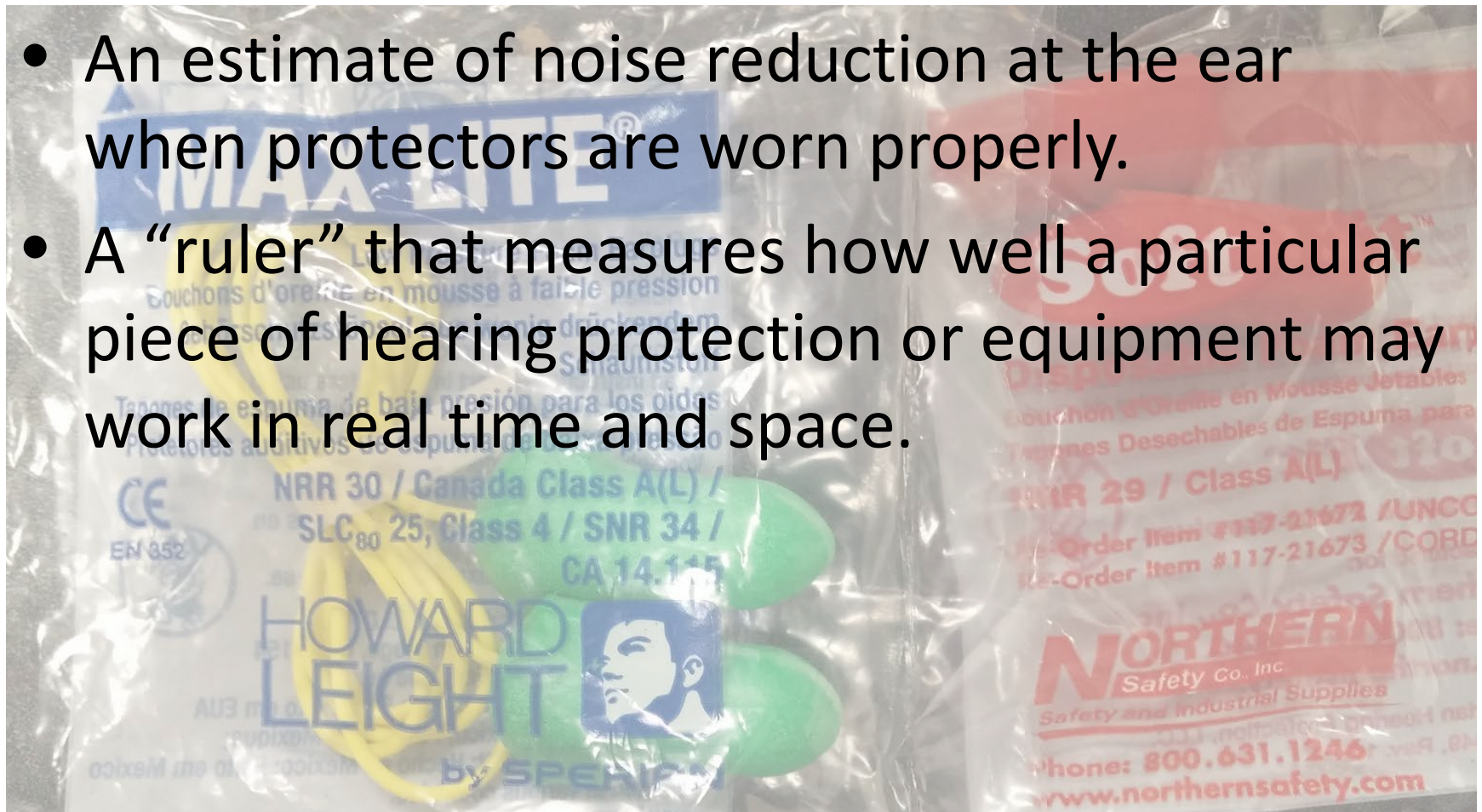


What is NRR?



What is NRR?

- An estimate of noise reduction at the ear when protectors are worn properly.
- A “ruler” that measures how well a particular piece of hearing protection or equipment may work in real time and space.



NRR 30 / Canada Class A(L) /
SLC₈₀ 25, Class 4 / SNR 34 /
CA 14.115

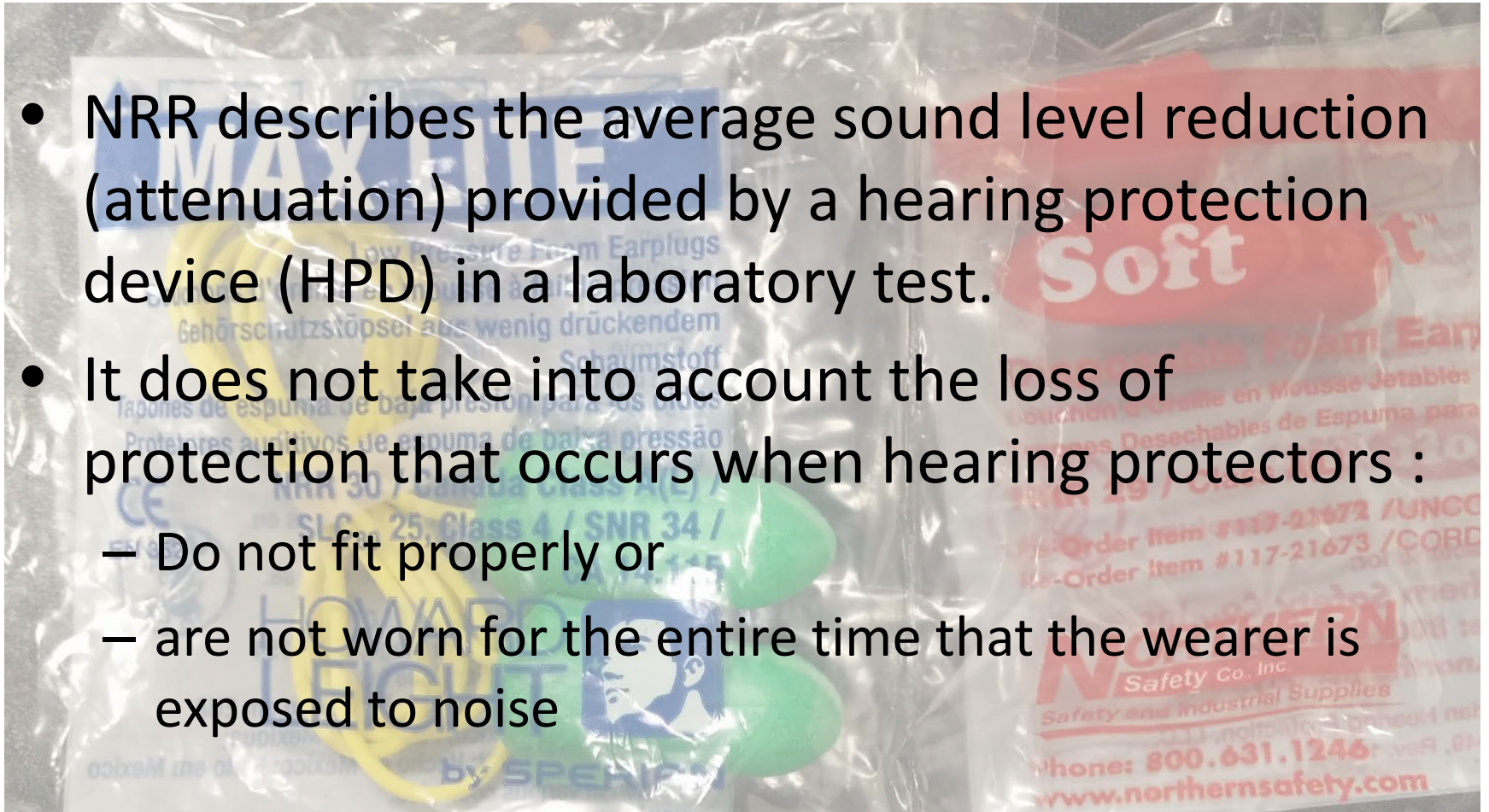


Soft Foam
Couchon d'oreille en mousse jetable
Tampons Desechables de Espuma para
NRR 29 / Class A(L)

NORTHERN
Safety Co. Inc.
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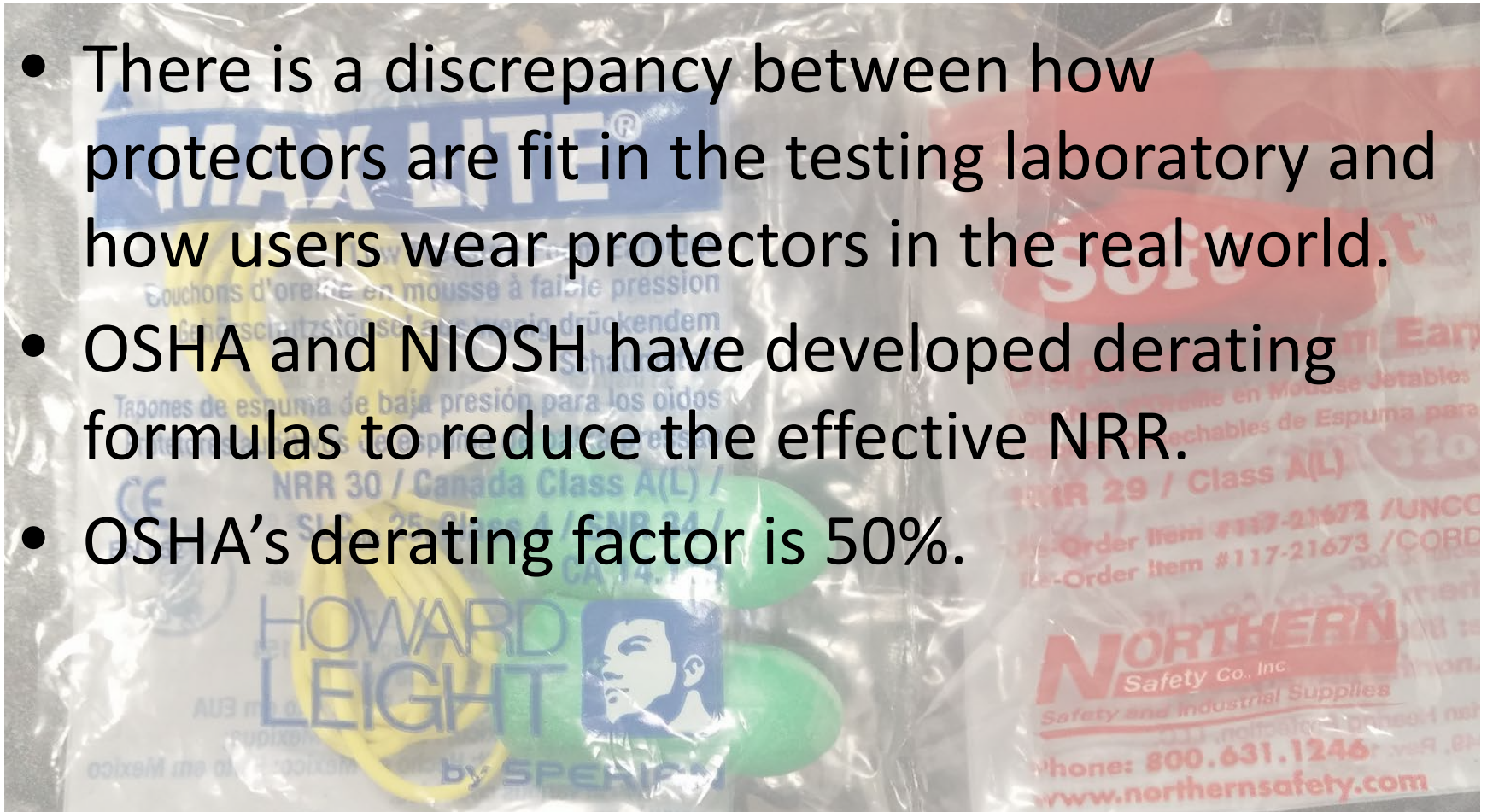
How is NRR Determined?

- NRR describes the average sound level reduction (attenuation) provided by a hearing protection device (HPD) in a laboratory test.
- It does not take into account the loss of protection that occurs when hearing protectors :
 - Do not fit properly or
 - are not worn for the entire time that the wearer is exposed to noise



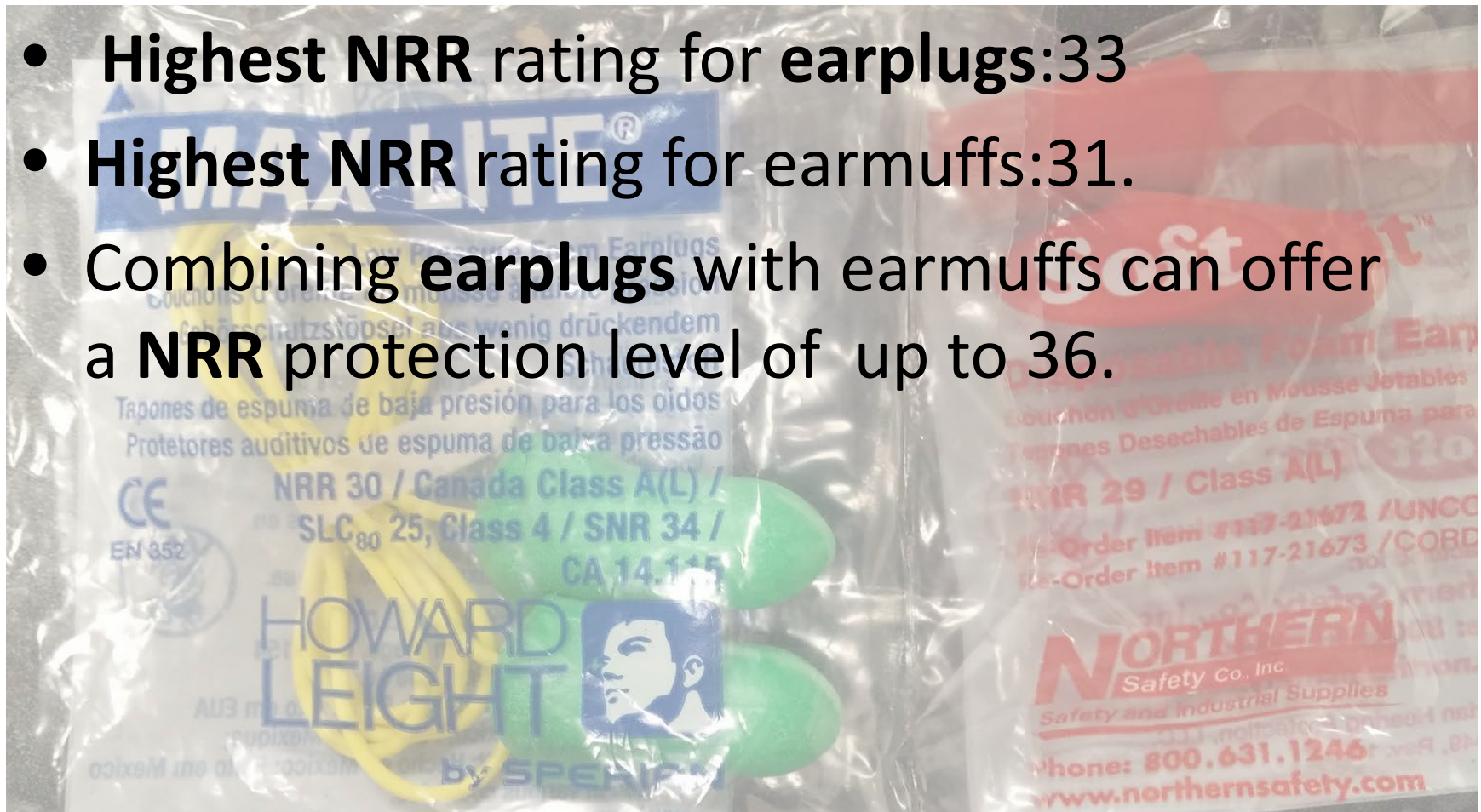
Actual Usage Gap

- There is a discrepancy between how protectors are fit in the testing laboratory and how users wear protectors in the real world.
- OSHA and NIOSH have developed derating formulas to reduce the effective NRR.
- OSHA's derating factor is 50%.



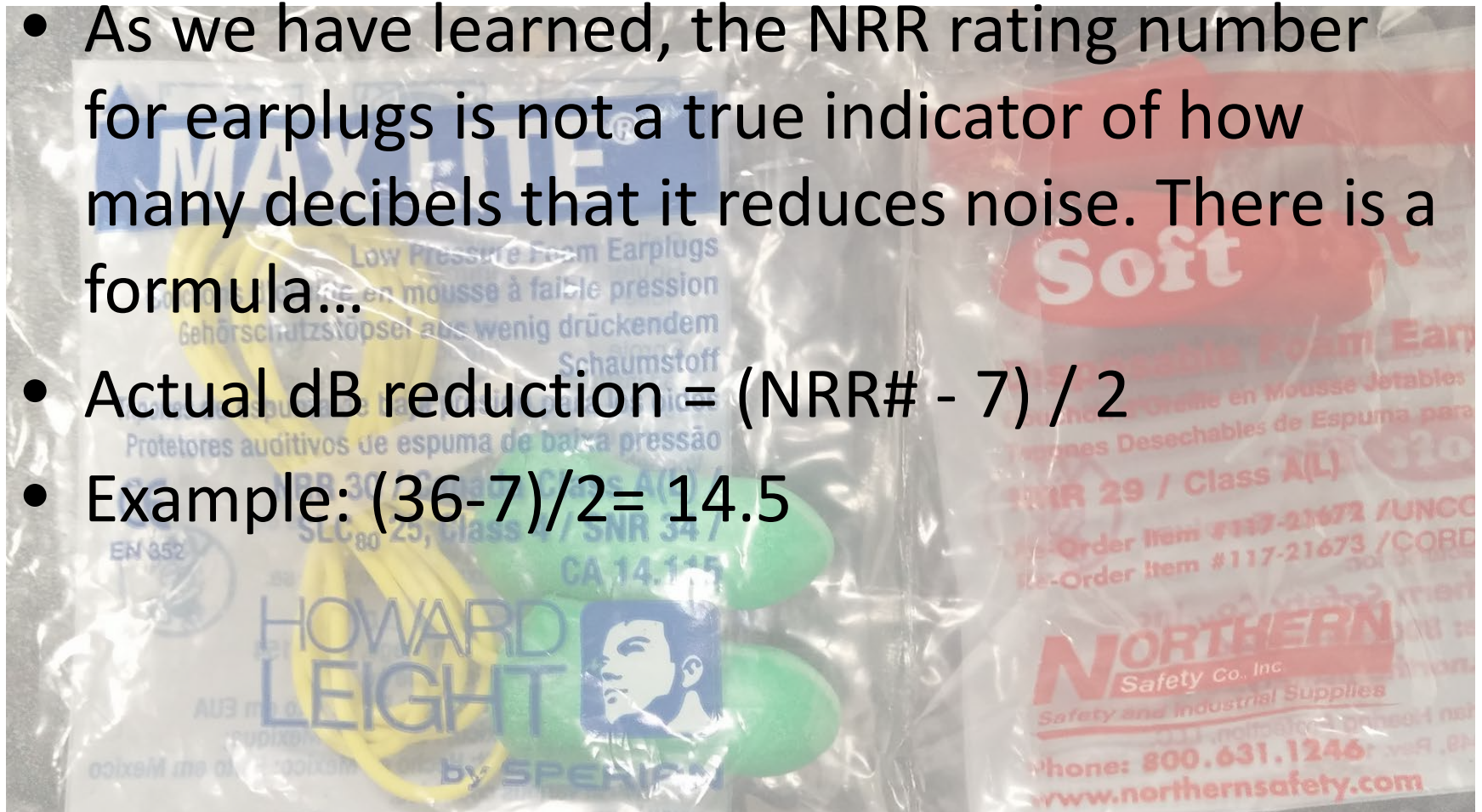
How Much Protection?

- **Highest NRR rating for earplugs: 33**
- **Highest NRR rating for earmuffs: 31.**
- Combining **earplugs** with earmuffs can offer a **NRR** protection level of up to 36.



How is the Gap Addressed?

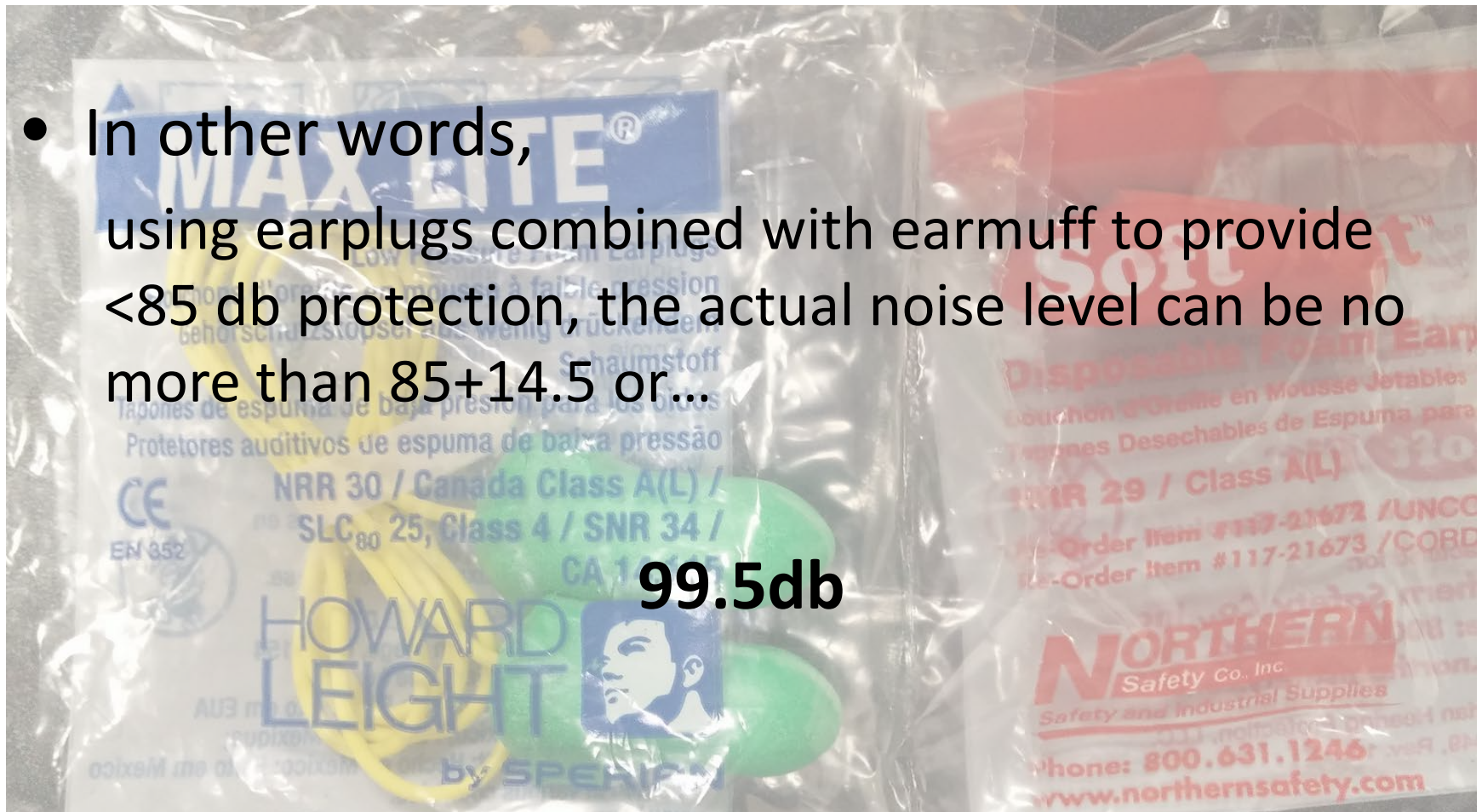
- As we have learned, the NRR rating number for earplugs is not a true indicator of how many decibels that it reduces noise. There is a formula...
- Actual dB reduction = $(\text{NRR\#} - 7) / 2$
- Example: $(36-7)/2 = 14.5$



How is the Gap Addressed?

- In other words, using earplugs combined with earmuff to provide <85 db protection, the actual noise level can be no more than $85+14.5$ or...

99.5db



How are Providers Helping?

The diagram illustrates an EPA Noise Reduction Rating (NRR) label for a 'Model XYZ Foam Earplug'. The label is divided into several sections:

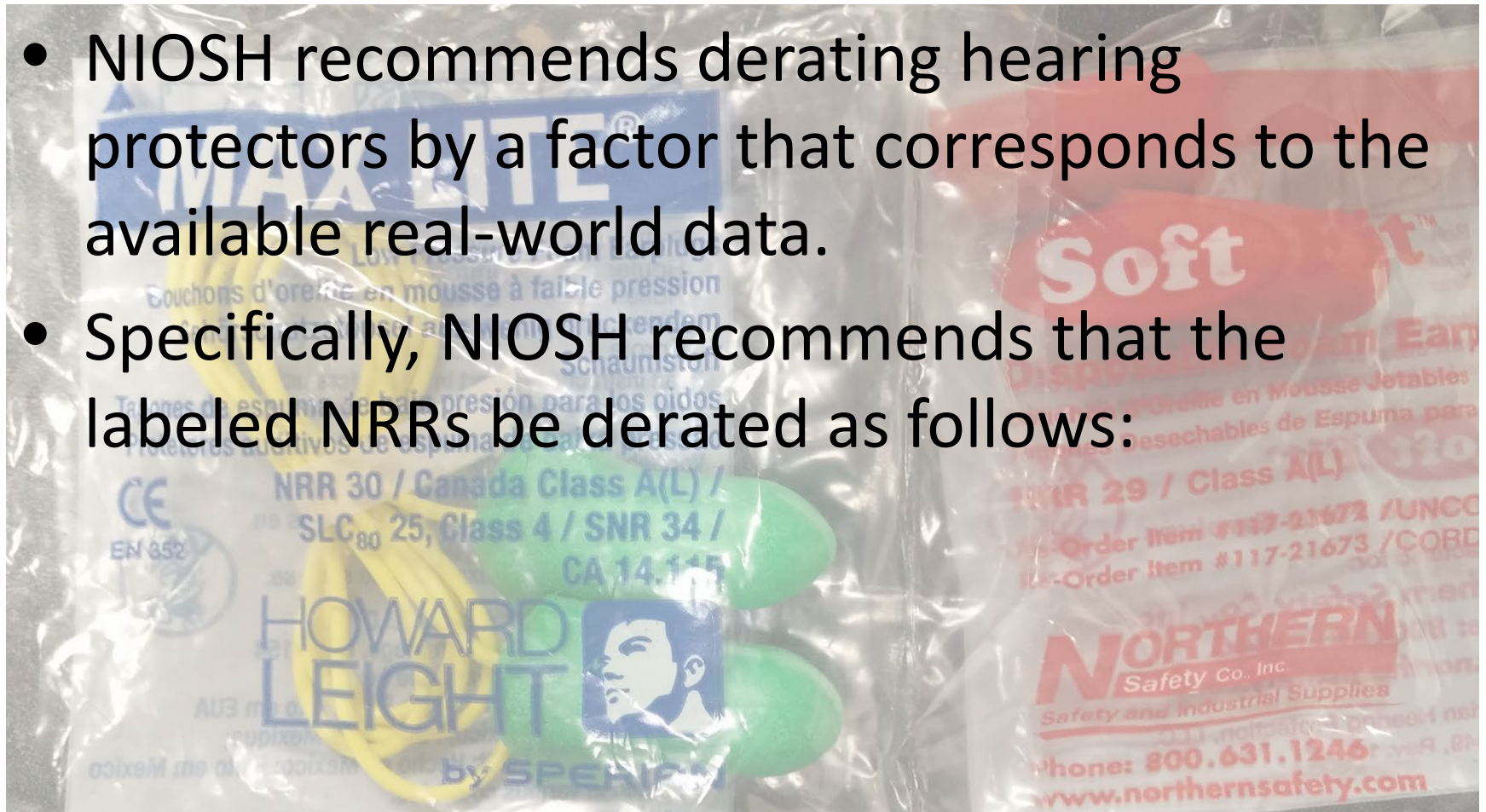
- Top Section:** Features the title 'Noise Reduction Rating' on the left and 'DECIBELS' on the right. A horizontal scale of five boxes is shown, with the second and third boxes shaded. The numbers '23' and '29' are positioned above the second and third boxes, respectively. A red arrow points from the '23' to the 'Noise Reduction Rating' text, and another red arrow points from the '29' to the 'DECIBELS' text.
- Second Section:** Contains a paragraph explaining the NRR: 'The Noise Reduction Rating shows the range of protection expected from this protector in normal usage. The lower number is the amount of protection possible for most users (80%) to achieve or exceed. The higher number is the amount possible for a few motivated proficient users (20%) to achieve or exceed. Higher numbers denote greater protection.'
- Third Section:** Lists the manufacturer as 'XYZ Corporation, Anytown, USA' and the product as 'Model XYZ Foam Earplug'. A red arrow points from the manufacturer name to the explanatory text in the second section.
- Bottom Section:** Includes the text 'Federal law prohibits removal of this label prior to purchase', the EPA logo, and the text 'Label required by U.S. EPA Regulation 40 CFR Part 211, Subpart B'.

Three callout boxes provide additional context:

- Left Callout:** 'Two-number range displays the estimated protection achievable by minimally-trained users (80%) versus proficient users (20%).'
- Right Callout:** 'A wider range indicates greater variability in the fit of that HPD. Smaller ranges indicate more consistency of fit. For example, earmuffs will usually have a tighter fitting range than earplugs, and may have a smaller NRR range.'
- Bottom-Left Callout:** 'Purchasers can be referred to additional training material found on the manufacturer's website.'

What does NIOSH say?

- NIOSH recommends derating hearing protectors by a factor that corresponds to the available real-world data.
- Specifically, NIOSH recommends that the labeled NRRs be derated as follows:



CE
EN 352

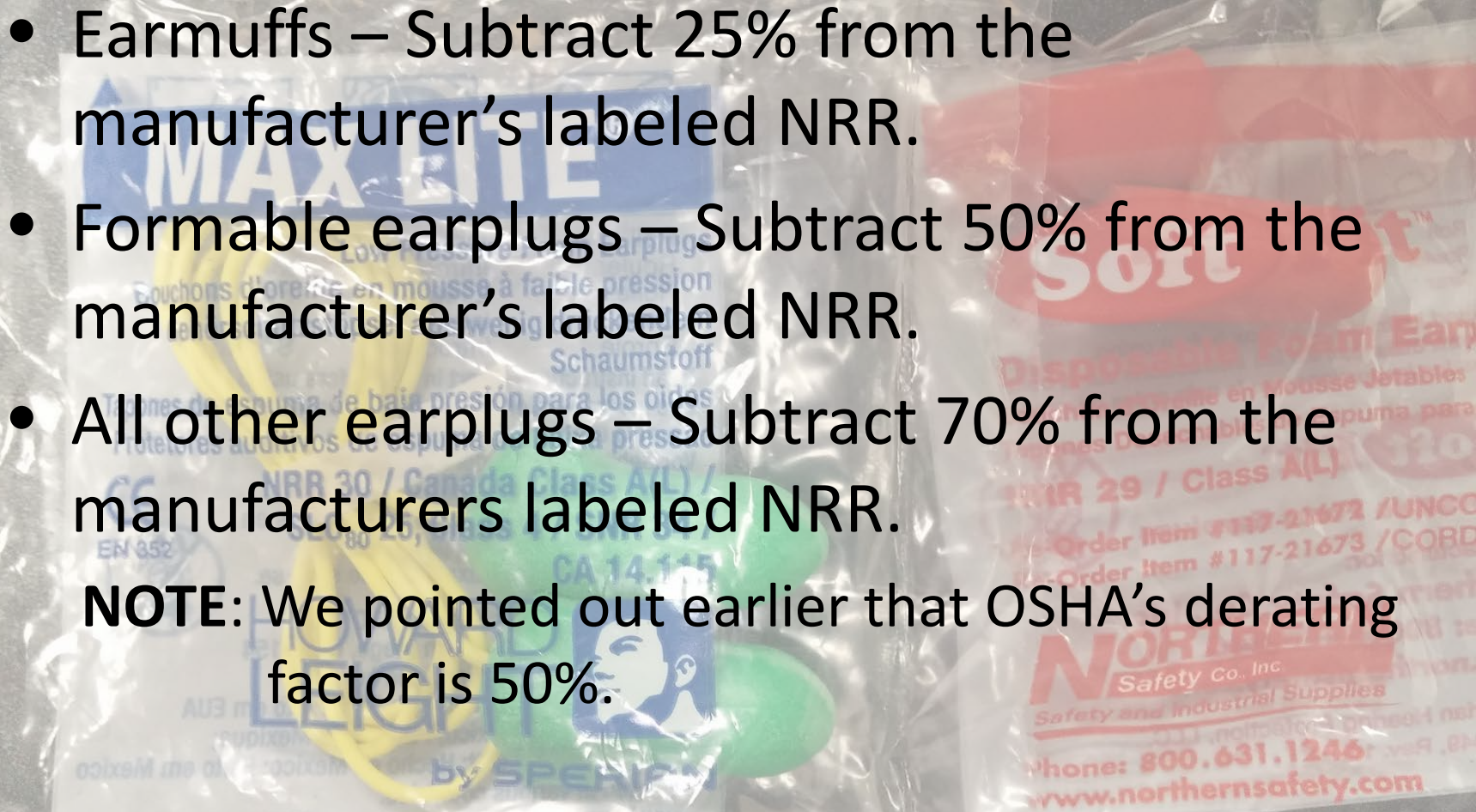
NRR 30 / Canada Class A(L) /
SLC₈₀ 25, Class 4 / SNR 34 /
CA 14.115

HOWARD
LEIGHT
by SPEAR

Soft Hat™
NRR 29 / Class A(L)
Order Item #117-21672 / UNCC
Order Item #117-21673 / CORE

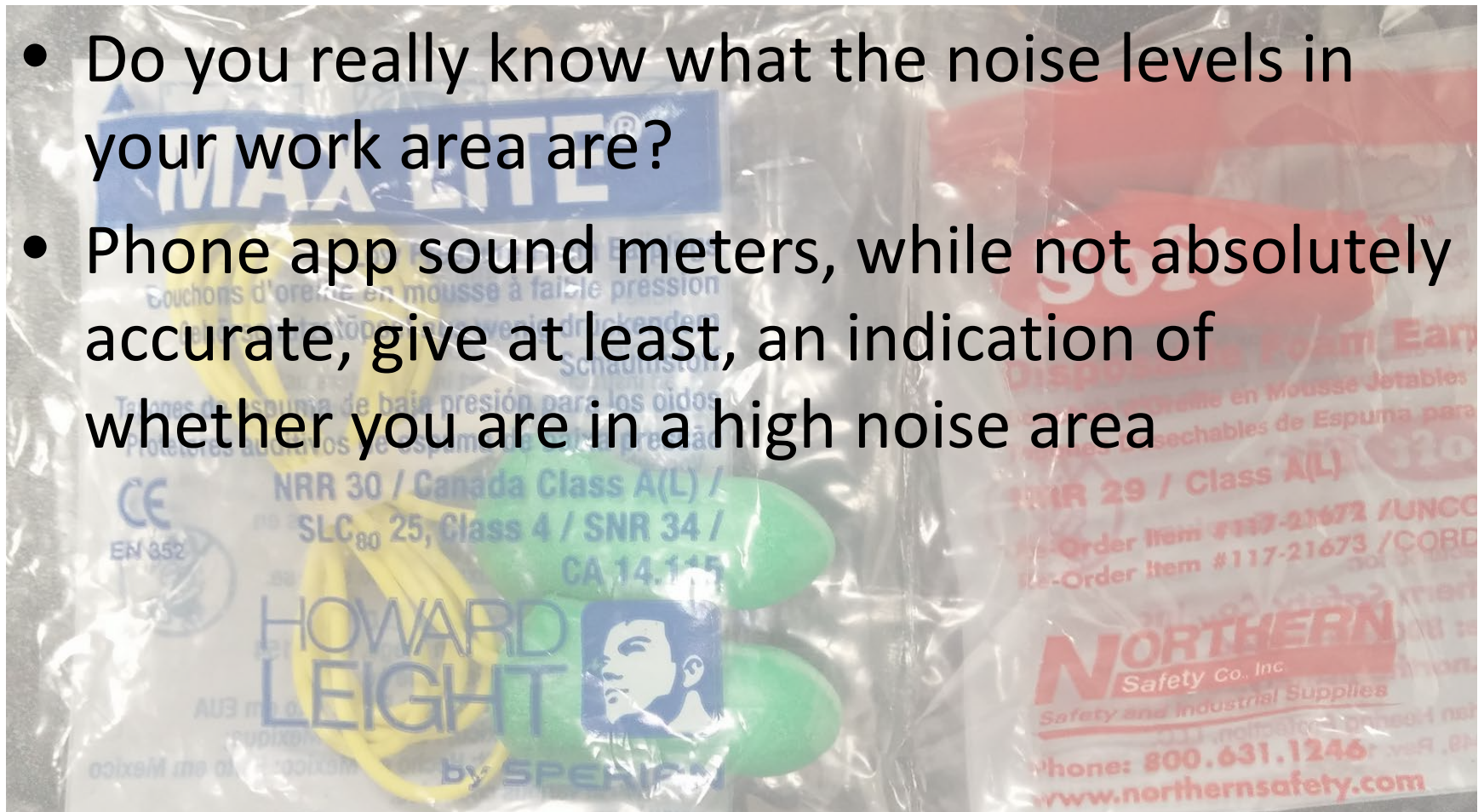
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According to NIOSH...

- Earmuffs – Subtract 25% from the manufacturer's labeled NRR.
 - Formable earplugs – Subtract 50% from the manufacturer's labeled NRR.
 - All other earplugs – Subtract 70% from the manufacturers labeled NRR.
- NOTE:** We pointed out earlier that OSHA's derating factor is 50%.
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Question...

- Do you really know what the noise levels in your work area are?
- Phone app sound meters, while not absolutely accurate, give at least, an indication of whether you are in a high noise area



References

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- SNR vs. NRR <http://eardefender.co.uk/snr-vs-nrr/>