De-Esser

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Chapter 1: Introduction

Thank you for choosing the Waves DeEsser – a versatile audio plug-in for selective and creative compression of high frequency 'ess' sounds in recordings. To get the most out of your new Waves plugin, please take a moment to read this user guide.

To install software and manage your licenses, you need to have a free Waves account. Sign up at www.waves.com. With a Waves account you can keep track of your products, renew your Waves Update Plan, participate in bonus programs, and keep up to date with important information.

We suggest that you become familiar with the Waves Support pages: www.waves.com/support. There are technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

Chapter 2: Quick Start

1. Let us assume we want to reduce the ‘esses’ in a male vocal track. Click on the Load button and select the “Male Ess” factory preset. This sets the SideChain frequency to 4500 Hz, the frequency around which typical male voice ‘esses’ lie.

2. Drag the threshold down until the ‘esses’ are sufficiently attenuated. Attenuation takes place when the threshold slider is below the peak of the blue-bar meter (energy detector). The red-bar meter shows the instantaneous gain reduction applied to the audio (in dB). An infinite-peak-hold feature displays the highest level of attenuation (click to reset).

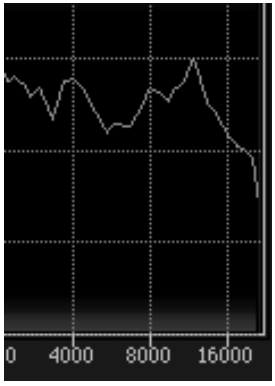
3. To fine-tune DeEsser, click the Monitor button to SideChain mode. Now you can listen to the SideChain. Choose which SideChain filter mode you require from either HighPass or BandPass. The HighPass filter mode is suitable for attenuating a full range of ‘ess’ sounds. The BandPass filter mode is suitable for isolating and attenuating a specific narrow band of high frequencies.

4. Simply listen to the sound in the SideChain whilst adjusting Freq until you hear just the ‘esses’ for reduction and little else of the remaining signal (that is, not too much of the voice itself).

Chapter 3: Overview

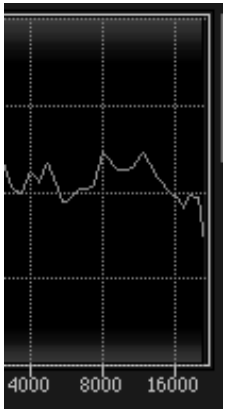
We are all familiar with the harsh ‘ess’ sounds orators or singers can produce during a powerful delivery close to a microphone. Almost any vocal recording will contain ‘ess’ sounds, whether from a strong vocal delivery, bad recording, speech impediments or simply many ‘ess’ words spoken together. Wind instruments and other musical instruments can also create shrill high-pitched noises.

Sound engineers need to control these harsh ‘ess’ sounds in most recordings. Here is a graph of a strong ess sound from a vocal track (graph from Waves PAZ). You can see the energy strongly centered about 12kHz (rather high for an ess sound). DeEsser is an audio plug-in for attenuating higher pitched frequencies such as those found in ‘ess’, ‘shh’ and ‘chh’ sounds.



Featuring very sharp filters in the SideChain and the choice of either Wideband or Split audio paths, DeEsser is suitable for processing full mixes, solo vocal-takes and instrumentals. Gentle DeEssing on complete mixes produces great sounding results.

DeEsser enables sound engineers to creatively compress ‘ess’ sounds. Here is the same section shown previously, after de-essing from 3kHz and higher:



Chapter 4: DeEsser Controls

DeEsser graphic interface (Mac shown; PC issame)

DeEsser Controls

Thresh

Adjusts the level above which attenuation takes place in the SideChain. To adjust the threshold, click and drag the slider down until the 'esses' are sufficiently reduced. NOTE: lowering the threshold too much will result in a muffled sound (i.e. too much attenuation).

Audio

Toggles between Wideband and Split compression modes. In Wideband mode, attenuation is applied to the entire audio band. In Split mode (i.e. the audio is split into low and high frequency signals), attenuation is applied only to the HighPass signals.

Freq

Sets the frequency level in the SideChain filter using a value window control.

SideChain

Toggles between a HighPass and BandPass filter. The HighPass filter ‘looks at’ all the frequencies above the set frequency, the BandPass at a narrow band around the set frequency.

Monitor

Use this to listen to just signals in the SideChain. When in SideChain mode, a yellow light below the Monitor button switches on.

DeEsser Displays

Energy Detector

Energy of the SideChain (dB below 0 dBFS). The energy bar-meter and threshold-slider are aligned for easy adjustments and visual feedback.

Attn

Instantaneous gain reduction (attenuation) applied to the audio signal (in dBs).

Output

An infinite peak hold feature shows the highest output level. Click to reset.

Chapter 5: DeEsser Internal Design

DeEsser internal design

Signals entering DeEsser are fed into the audio path and SideChain.

In the SideChain, audio is filtered and translated into attenuation - a gain reduction of zero or more dB. This attenuation is then applied to the audio path, giving the output.

SideChain

The SideChain consists of a filter, an energy detector and a compressor. The filter has two modes of operation: HighPass and BandPass. HighPass mode is useful for attenuating several different ‘ess’ sounds. BandPass mode is more suitable for attenuating a specific high frequency. The chosen filter’s frequency is set by the Freq. control. NOTE: This filter is only related to the SideChain, not the audio, which can be either Wideband or Split.

The energy in the filtered signal is measured and translated into attenuation by a hard knee compressor according to the threshold set by the user. When the SideChain energy is below threshold, the compressor generates no attenuation. When energy exceeds the threshold, attenuation is generated – more energy above the threshold means more attenuation.

Audio path

In Split mode, audio is split into high and low frequencies. Attenuation generated by the SideChain is only applied to the high frequencies, while low frequencies remain unaffected. In Wideband mode, attenuation is applied to the entire audio.

Chapter 6: Frequently Asked Questions

When should the SideChain be in BandPass mode?

In general, the BandPass filter is used to isolate one type of 'ess'. The BandPass filter 'looks' at a narrow range of frequencies. The 'ess' sound in "Sweat" carries most of it's energy around the 6kHz mark (male voice). In "Sugar" most energy lies around the 4kHz mark (also male voice). Use the BandPass filter if you only want to reduce one 'ess' and not the other.

When should the SideChain be in HighPass mode?

If you have several different types of 'ess' noises you wish to reduce, the HighPass filter is recommended. DeEsser responds better in HighPass mode when applied to, for example, a vocal track containing a variety of 'ess' frequencies and vocal inconsistencies. NOTE: the HighPass filter increases the chance of compressing other high frequency sounds such as strings and high-pitched instruments.

Why can the audio be either Wideband or Split, and how do I choose?

Most compressors containing a sidechain component can be used as de-essers. However, they require an external equalizer to select the frequency range for reducing. Such compressors have Wideband audio pass- ing thru them and thus compress all frequencies equally.

This is the most traditional approach for purist or vocal-only applications. For powerful 'esses' and the more modern vocal styles, splitting the audio into 2 pieces is more effective and results in fewer side effects on frequencies outside the 'ess' range. If you must de-ess a mixed track of instruments and vocals, the Split method is nearly essential.

Choose the Split mode for the most accurate and strong de-essing and for mixed tracks.

Choose Wideband mode for gentle voice-track-only de-essing and when you do not want to have a crossover in the processing path.

Why would I want to monitor the SideChain?

Only to make it easier to adjust the Freq. You can "dial in" the best Freq value by simply monitoring the SideChain. Simply listen to the sound as you adjust the Freq until you believe that you are hearing what you want to de-ess and as little as possible of the remaining signal (that is, not too much of the voice itself).

Is it possible to over DeEss?

Absolutely! If your singer starts sounding as if you have removed their two front teeth, then the Threshold is too low! Adjusting the amount of de-essing is subjective - just listen and use your judgement. When the voice sounds more natural and the 'esses' are not overpowering, that is enough!

Chapter 7: Factory Presets

Use the bar at the top of the plugin to save and load presets, compare settings, undo and redo steps, and resize the plugin. To learn more, click the icon at the upper-right corner of the window and open the WaveSystem Guide.

General settings are provided for male and female voices, although they can be used for instruments as well. Setups are provided as convenient starting points. The difference between each setup is the starting frequency. All presets set DeEsser to Split mode and use the BandPass SideChain filter mode.

Kindly note that “shh” settings are also relevant for ‘ch’, ‘th’, and hard consonants, such as ‘t’, ‘d’, and ‘k’.

Default

When you first run DeEsser, the default settings are suitable for almost any speech or song recording.The default frequency setting is 5506Hz, which will attenuate down to about 3kHz, the main attenuation taking place from 5kHz up.

The default SideChain filter mode is HighPass for general de-essing.

The default audio setting is Split mode, meaning the audio path is split into two parts - only high-frequency ranges receiving attenuation. This mode is more commonly used, whether for voice or for full mixes.

As with all presets, simply adjust the Threshold until some attenuation takes place, then adjust the Freq to affect the desired range.

Male Ess

The Freq is set to 4500, as most males have lower ‘ess’ frequencies than females. An exception may be older men who sometimes have rather strong and rather high-frequency whistling.
Therefore, this setup covers the lower range of possible ‘esses’ for the average male.

Male Shh

Most ‘shh’ sounds are nearly one octave lower than ‘ess’ sounds. However, if the Freq is set too low, then too much of the sound is affected. Therefore, a Freq setting of 3385Hz is set for the Male Shh. DeEsser will ‘reach’ down to about 1700Hz, but with lesser and lesser maximum gain reduction.

Female Ess

Female speech and singing generally has higher, sometimes much higher-pitched ‘ess’ sounds than male. This setup has a Freq of 6779.

As with all the factory setups, the frequency settings were determined by averaging a large number of voices. The Freq may have to be adjusted a large amount to accommodate a certain voice - with some female voices, the ‘ess’ sounds can range as high as 9kHz center points!

Female Shh

The frequency setting of 5077 generally covers the female ‘shh’ range which, although lower than the ‘esses’, is not as harsh or as low as the male ‘shh’.

Generally, female ‘esses’ and ‘shh’ sounds vary more in frequency than males. In other words the various fre- quencies of the ‘esses’ and ‘shh’ sounds of a female may have a wider frequency range than those of a male. Thus you may find that using the SideChain filter in HighPass mode more responsive.

Conversely, in BandPass mode only the specified frequency band is measured.

To summarize, if a singer has ‘esses’ spanning a large range of frequencies, try the SideChain filter-mode set to HighPass.