



PHOTOGRAPHY SIMON LEES

Harma cryogenically treated valves

£14.10-£19.99



Watford's new cryogenic valve range steals a march on the competition – they're almost too cool for words by Nick Guppy

If you're into the more esoteric end of hi-fi sound reproduction, you won't have failed to notice that cryogenic treatment is one of the current crazes, with many companies offering components that have been through this process and one or two that will even dip your own kit for you. Cryogenic treatment involves putting components into a container that is slowly filled with liquefied gas (usually nitrogen), reducing the temperature to a very frosty minus 195 degrees Centigrade over a period of approximately 12 hours. Having reached this temperature, treated items are then held for what's called the 'soak phase', which is about another 12 hours at minus 195C, before being slowly returned to room temperature over yet another 12 hour period. Part of what cryogenic treatment apparently does is re-align a material's crystalline structure to a more uniform state, removing the stresses introduced during the manufacturing process. Although hi-fi extremists are susceptible to a lot of nutcase ideas, cryogenic treatment is something to be taken more seriously as it does make a physical difference

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and is used on many mission-critical items in the aerospace industry – space shuttle windows are one notable example, and there are many others.

Where audio is concerned, hi-fi interconnecting cables are the most commonly treated items, though it's being applied to almost everything from circuit boards to capacitors to integrated circuit chips, and it can be used on valves. Watford Valves' Derek Rokoszewski has recently introduced his own range of cryo-treated valves under the well-respected Harma Diamond label, and for the past few weeks we've been trying them out to see if a guitarist's ears are as keen as a hi-fi enthusiast's when it comes to spotting the difference.

HARMA VALVES	TEST RESULTS
Build quality	★★★★★
Playability	★★★★★
Sound	★★★★★

- **WE LIKED** NOS sound quality and hopefully reliability too, but from new valves at a realistic price
- **WE DISLIKED** Cryo valves could do with being labelled differently to distinguish them

Unlike a transistor, an electron valve is an electromechanical device – inside the glass envelope you have a lot of small wire components that are spot-welded together and have to be placed with a high degree of precision. Valves are susceptible to vibration, which is plentiful in guitar amps, and this leads to unwanted resonances which result in noise: either low-frequency rattles or high-pitched squeals that don't do any favours to your tone. Varying tolerances also affect electron flow and that changes the valve's electrical performance, altering gain, frequency response and noise levels. There was a time when valves were made to higher standards and quality was more uniform, but these days manufacturing and quality control is far more varied, which has a direct effect on the quality →

The rivals

While no other supplier as yet offers a cryo-treatment option, there are many other performance-matched valves sets available; two of the most widely available sources are Mesa Engineering, whose 6L6s sell for around £120 for a quartet, and of course Groove Tubes, who started the whole market off well over 20 years ago. Its 6L6s range from around £56 per quartet for Chinese types up to a massive £192 for its own reproduction of the famous General Electric 6L6. EL34 types follow a similar pricing structure; the GT 6CA7 GE is another reproduction of a classic valve and sells for around £192 per quartet. Preamp valves from both suppliers range from around £12-£20 depending on type. We think it's just a matter of time before cryogenic treatment becomes a more widely available option...

ACCESSORIES

HARMA DIAMOND CRYOGENICALLY TREATED VALVES

ORIGIN: Various
TYPE: Cryogenically treated valves in various preamp and power amp formats
RANGE: The current range of Harma cryo-treated valves include...
 ECC83 STR Cryo £16.45
 ECC83/7025 DR250 Cryo £17.99
 EL34 Retro Cryo £19.99
 E34L STR Cryo £19.99
 6L6GC Retro Cryo £19.99
 6L6GC STR Cryo £19.99
 EL84 Cryo £14.10
 EL84 Vintage Cryo £19.99
 EL84 STR Cryo £19.99
 GZ34 STR Cryo £16.45
OPTIONS: Watford Valves will be treating other valves in this fashion – call for details
Watford Valves
01923 893270
www.watfordvalves.com

→ of sound you can expect to get from any valve amp in any price bracket. Put simply, even the best guitar amp is only as good as the valves you plug into it, and for the past two decades or more many businesses have grown up matching and quality controlling valves for guitar amplification use in order to maximise their performance. This is something that's been applied mostly to newly made valves – New Old Stock (NOS for short) is where old un-used valves from higher quality and now defunct sources (like Mullard, Tung-Sol, Sylvania or Telefunken) are re-sold, either in their original packaging or re-branded. With NOS valves, quality control is less of an issue as they were made better to start with, however, NOS supplies are depleting and it was partly with this in mind that Watford Valves decided to take the plunge into minus 195 degree nitrogen. “One of the key things for me was price – it took a while to persuade the cryo people that guitarists need good

Changing the power valves from standard to cryo on all amps added more definition and punch. Notes that were hit hard seemed to jump out of the speaker

valves just as much as hi-fi buffs but they weren't going to pay hi-fi prices,” Derek explains. “So it wasn't something that happened on a whim. I was interested whether the cryogenic treatment would make a noticeable difference but it took quite a while before we found someone who agreed to treat a large quantity of valves and charge a reasonable rate for doing it.”

SOUNDS: Watford supplied us with two new sets of its Harma ECC83 preamp valves along with EL84, EL34 and 6L6 power valves, all in both cryo and non-cryo treated versions. It's worth pointing out that replacing any old valve with a new one will make some kind of difference, so this way we were able to evaluate the cryogenic treatment effect with more certainty. For testing, we used a Mesa/Boogie Mark 1 reissue, which can take EL34s or 6L6s, as well as an old Marshall 'Plexi' 50 head and a Vox AC30.

The first thing we noticed was that all of the cryo-treated ECC83s performed exceptionally well in the Boogie's critical V1 position. Most valves used here squeal or ring at higher gain settings – it's not unusual to go through a dozen or more before finding one that doesn't – so it was something of a surprise to put in five, one after the other, and hear consistent low-noise performance with a total lack of microphonic feedback, especially as the gain on tap was, if anything, slightly higher when compared to Watford's non-cryo valves. Compared to the NOS Telefunken's this amp is normally run with, the Harma cryo ECC83s offered an improvement in gain and high frequency response that noticeably enhanced this amp's singing lead voice and lush clean sounds.

Changing the power valves from standard to cryo on all amps added more definition and punch. Notes that were hit hard seemed to jump out of the speaker with a faster yet more controlled attack, while clean chords had a more spacious quality. This was particularly true for the Marshall.

“That's something everyone who's tried them agrees on,” Derek comments. “When we put them on a test rig, the numbers are more or less the same for cryo and non-cryo types, but there's a definite audible difference – the cryo valves somehow sound bigger and wider.”



Verdict

There's no doubt in our minds that Watford's cryogenically treated valves are an improvement on its standard Harma brand equivalent, which is already held in high regard. Watford's extensive testing and matching process guarantees reliability and performance – Brian May, Eric Clapton and Oasis are just some of the many top names who rely on Watford's Harma brand valves for their sound. We think that with the NOS and JAN wells about to run dry, Watford has found a way of providing similar quality to New Old Stock valves at a realistic price – and that has to be a good thing for guitar players.

It's very likely that, as more suppliers latch on to the cryogenic treatment concept, you'll see cryo valves becoming the standard in years to come for musical instrument amplification. Longevity is another reason why those in the know go for NOS or JAN valves, and it will be interesting to see if cryogenic treatment adds substantially to a valve's useful life as well as improving its sonic performance. If it does – and we think it probably will – then the added expense of fitting a set of cryo valves to your favourite amp will be more than justified.

Despite costing more than the regular Harma equivalent, Watford's cryo range valves actually prove to be very competitive when you compare them against similarly treated valves from other specialist hi-fi suppliers, or premium matched sets for guitar amp use from the most well-known competition. So, if your amp needs a re-valve, check these out with our recommendation – if this reviewer's ears can hear the difference they make, so will yours. **G**

Harma Cryogenically Treated Valves

Guitarist RATING ★★★★★



Left: EL34
 Right: ECC83



Left: 6L6
 Right: 7025

