

Frozen Riff

TUBE TECHNOLOGY GETS A SPACE-AGE LEG UP, COURTESY OF WATFORD VALVES' NEW RANGE OF CRYO-TREATED BOTTLES. **TIM SLATER** CHILLS OUT...

Watford Valves is treasured as a keeper of the flame when it comes to providing a steady supply of top quality tubes. Lately, the company has gone public regarding its endorsement of a fascinating new approach to squeezing more tone from the humble vacuum tube, a variation on a process pioneered by NASA to improve the stability in metals used in their space program.

'Deep cryogenic treatment' subjects metal objects to extreme cold over a period of around 36 hours. It's said to reduce 'construction stresses' in metals by realigning molecules. Vacuum tubes apparently benefit from this process, because realigning the steel valve bases' molecules is believed to improve the flow of electrons, thus dramatically enhancing the tone and performance of the tubes.

Watford Valves' cryogenically treated valves are sold under the company's own Harma brand, which

includes 'Cryo' and 'non-Cryo' versions of all the most popular types of power and preamp tubes.

For our extended test, we select two sets of high-gain Retro EL34s and matching ECC83/7025 preamp tubes in Cryo and non-Cryo versions, plus two sets of untreated and treated low-gain EL34s and ECC83s for direct comparison. Comparing the normal and high-gain Harma tubes back-to-back with their cryogenically-treated equivalents obviously requires a suitable test bench, and so our much abused but sweet-sounding 50-watt Marshall JCM 2000 head is wheeled in to serve as the host amplifier for the test, with local amp tech Chris Newman providing technical assistance. The volume and tone controls are left at the same settings all the way through, and we use the Marshall's clean and dirty channels on every set of tubes. The tonal differences are clearly discernible, and after all four sets have been given a thorough work out, the results take everybody by surprise...

HARMA DIAMOND EL34 STR & ECC83 STR (STANDARD)

PRICE: £34L STR £15.00 each
PRICE: ECC83 STR £11.75 each

All of the tubes used in this test are digitally matched and graded for power, to deliver either maximum drive and distortion or a cleaner sound with more headroom, depending upon your particular needs. The first set of tubes are standard STR EL34s, that are made to offer the widest frequency response and lower distortion than the more aggressive-sounding 'Retro' EL34s that we'll look at later.

Right from the word go, the standard STR tubes make a dramatic difference, compared with the mixture of (admittedly tired) Groove Tubes GTE 34S output tubes and standard Marshall ECC83 preamp tubes fitted prior to the start of the test.

The first impression is that the Harma tubes deliver a bigger tone; it's a big, sparkly clear sound that

GBINFO

Watford **Valves**

HARMA VACUUM TUBES BY WATFORD VALVES

PRICE: £11.75 - £19.99, depending on type

BUILT IN: Varies with type

TYPE: Range includes all major pre and power valve types, here in standard and cryogenically treated formats

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seems to fill the room; the bass is tight and punchy and doesn't appear to compress and lose definition under heavy picking.



■ Test One: Harma Diamond EL34 STR & ECC83 STR (Standard). Old Marshall tube pictured – oops!

The tone feels much closer to the spirit of the classic vintage Marshall sound: bags of seriously meaty definition, no mush and a very loud and strident clean tone. The overdrive channel sounds powerful and rich too; the tight bass doesn't sack-out or squash under heavy gain, and big power chords maintain an even definition across all of the strings, with no loss of low end. The amp also seems to respond more sensitively to dynamics; roll the guitar's volume back a few notches and everything begins to clean up nicely, but increasing the volume back to the max really kicks in a powerful surge. These Harma tubes transform the Marshall from an enjoyable, if fairly unremarkable amplifier, to a more impressive sounding tone-monster

HARMA DIAMOND CRYOGENIC STR 34L/CRYOGENIC STR ECC83

PRICE: Cryogenic STR 34L £19.99 each
PRICE: Cryogenic STR ECC83 £16.45 each

The big difference between the cryogenic and standard STR tubes is that the cryogenic tubes seem to have a lot more gain and a much brighter,



■ Test Two: Harma Diamond Cryogenic STR 34L/Cryogenic STR ECC83



■ A brand new pair of Cryogenically altered tubes, yesterday

snappier tone. Watford Valves' chief tone guru Derek Rokoszewski confirms that he has received similar feedback but strangely, the Cryo and non-cryogenic STR tubes both apparently display identical gain characteristics on Watford's testing equipment, which must indicate that something else is happening. Despite what the 'scope may suggest, to our ears the Cryo tubes don't sound as warm and musical as the standard STR Tubes. The extra bite, crisp, glassy top end and all-round boost sounds very different from the non-Cryo EL34s.

The overall effect isn't unpleasant, just markedly different from standard, and if nothing else, it's proof at least that deep-freezing the valve bases produces tangible effects. If you don't like your amp overly warm and favour a harder punch, the Cryos are definitely worth a look.

HARMA DIAMOND EL34 RETRO & STR ECC83/7025

PRICE: EL34 Retro £12.77 each
PRICE: STR ECC83/7025 DR250 £14.10 each

These tubes are geared specifically towards modern high-gain overdrive; the preamp tubes play a major role, having a generally lower distortion threshold and a more pronounced upper midrange peak that crunches up a bit faster than normal. The EL34 output tubes are closely based on the now-legendary Mullard EL34, and closely resemble the model, both in terms of their impressively robust build quality and their rich, clear tone.

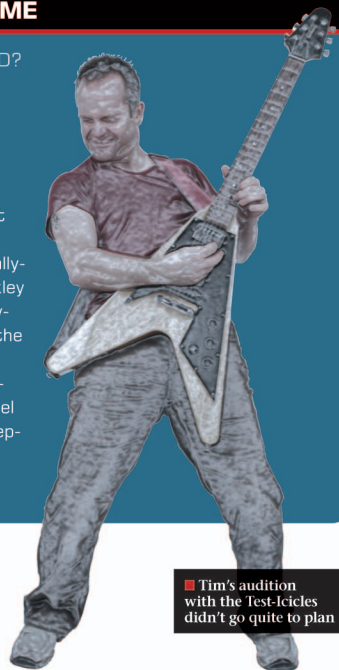
In the Marshall JCM2000 these tubes sound really terrific, capturing the warm, spanky grunt that serious Marshall fans associate with the best vintage models rather than the thinner, fizzy tone that characterises a few of the more recent examples of

FREEZE ME, PLEASE ME

YOU WANT IT EXTRA COLD?

■ **Cryogenic technology has expanded beyond the aerospace industry as it's gradually become cheaper and easier to use.**

Several musical instrument manufacturers have been experimenting with cryogenically-treated products. Dean Markley has been making cryogenically-treated guitar strings since the early 1990s, and you can find everything from cryogenically-treated acoustic guitars, steel guitar tone bars and even deep-frozen saxophones, if you are prepared to look. Now that's what we call cool.



■ Tim's audition with the Test-Icicles didn't go quite to plan

Bletchley's finest. The Retro tubes deliver a fat, musical-sounding crunch, with an exciting brashness that raises the hairs on the back of the neck, and the amp's dynamic response is also vastly improved; rolling back the volume pot tames even the most aggressive-sounding crunch into a usable semi-clean tone, and vice-versa.

Marshalls can sometimes sound a bit too squashy on the low end when you give the strings a really good smack, especially with buckets of distortion, but the Harma tubes add an impressive girth to big power chords without sounding murky or too compressed. Digging in hard seems to make the sound leap forward, rather than struggling to keep up, and that alone makes these tubes sound remarkable. They definitely give an amp an extra edge, so players who like plenty of grind from their EL34s will love them. Highly recommended.

HARMA DIAMOND CRYOGENIC EL34 RETRO & ECC83/7025

PRICE: EL34 Retro Cryo £19.99
PRICE: ECC83/7025 DR250 Cryo £17.99

In a word, wow! Good as the non-Cryo tubes undoubtedly are, these cryogenically treated Retro tubes distil the best elements of the non-cryogenic Retro tubes into a focused, harmonically sympathetic sound, resulting in a tight bass and an overall pleasingly warm break-up.

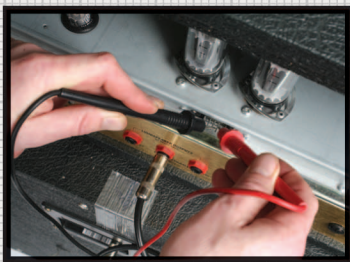
The effect is almost akin to running the amp through an



■ Test Three: Harma Diamond EL34 Retro & STR ECC83/7025 EL34 Retro

DETAILS

TO FREEZE OR NOT TO FREEZE? IT MAKES A DIFFERENCE FOR SURE, IN TERMS OF DYNAMICS AND RESPONSE



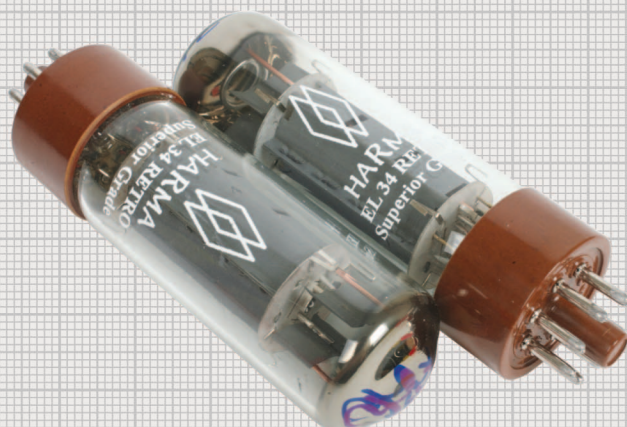
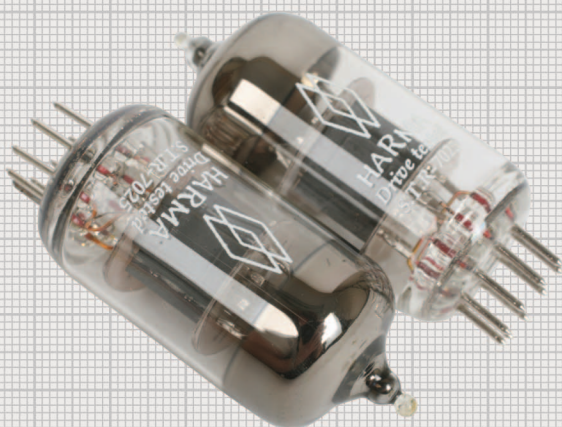
■ All tubes were correctly biased for each tube test in this review



■ The front end of the Marshall with its new cryogenically-treated tubes



■ Our test amplifier is Marshall's highly regarded JCM2000 DSL50



WATTS FROM WATFORD

STRAIGHT UP TOOB TALK

■ While there has been some controversy among certain sections of the music industry regarding the way that tubes are marketed, there is still plenty of mileage in the old-but-true saying 'you get what you pay for'.

Good quality tubes will always make an enormous difference to any amp's overall sound quality and reliability, and with that in mind Watford Valves offers its new Cryo-Valves at sensible prices and a refreshing lack of marketing BS, thus avoiding

possible accusations of catering to a 'king's new clothes' mentality and attempting to ensnare the gullible.

Watford Valves has a great reputation regarding anything to do with vacuum tubes for the music industry, and plenty of the world's greatest guitarists rely on Watford Valves' expertise to keep their gear running and sounding exactly as it should.

For more info about all of the tubes in the Watford Valves range, log onto:

www.watfordvalves.com

expensive piece of studio audio-enhancing equipment; everything sounds like it should, except it's simply bigger, brighter and louder than the standard setup.

Harking back to the lower-gain Harma tubes we reviewed earlier, the difference between the Cryo vs. non-Cryo Retros is like the difference between night and day. Whereas we feel that the Cryo EL34 STRs are a bit too brash, the high-gain Retro models benefit from the extra injection of gain and presence. Clean tones sound tight and funky, and the overdrive channel instantly sounds muscular

and punchy, with bags of sustain and a lovely liquid high end that cuts through without threatening to turn your eardrums into jelly.

The bigger, glassier tone and boosted highs puts me in mind of a Marshall amp running on 6L6 tubes, and the general impression is that the EL34's traditional smooth tones are slightly compromised by the Cryo-tube's greater definition and presence. However, it is noticeably much easier to tame the whole thing down and dial in a softer tone than it is to try and achieve the huge tone boost and sonic enhancement without installing the Retro Cryo-tubes.



■ Test Four: Harma Diamond Cryogenic EL34 Retro & ECC83/7025

GBCONCLUSION

DIFFERENT, BUT WE'D BE HARD PRESSED TO SAY 'BETTER'

■ It shouldn't go unsaid that listening to the differences between 'normal' and temperature-treated sets of the same vacuum tubes is always going to be an exercise in subtlety and personal preference.

The valves themselves vary from set to set, as will each and every amp in which they're fitted.

Nevertheless, the tonal differences between these Harma cryogenically-treated valves and their 'normal' counterparts surprised a number of people in the GB camp. The cryo-treated tubes definitely sound different; that's to say somewhat glassier, more edgy and with more punch and definition. Most of us found that less musical and pleasing than the softer, rounder character of the non-cryo tubes in the Marshall, but agreed that those same attributes may well be a benefit in a darker-sounding amp in need of a dynamic kick.

Definitely not a gimmick, nor are they over-priced: worth a look. **GB**