

## Why buy vacuum tubes from Audio Research?



Audio Research maintains a comprehensive inventory of quality vacuum tubes for every product it has manufactured during its four-decade history. These tubes are secured in quantity from leading manufacturers and vendors around the world, and must meet stringent standards for quality and reasonable cost. These vacuum tubes may be purchased individually, or in complete sets selected for maximum performance in an Audio Research product.

In current models, Audio Research attempts to use tubes which are either in active ongoing production, or available in large quantities at reasonable cost. As much as possible, this design philosophy helps assure future availability of these tubes to Audio Research owners. Exotic, costly, small-production-run tubes or so-called new-old-stock tubes are avoided.

Once purchased and received by Audio Research, vacuum tubes undergo exacting quality control measures to further assure reliable, sonically acceptable performance. Power output tubes -- currently KT150 and KT120 power beam tetrodes manufactured in Russia - are first mounted in test fixtures and burned in for 48 hours. This burn-in helps stabilize the internal operating parameters of the tubes before measurements for matching begin. Each power tube is then tested and graded for technical characteristics specified by Audio Research engineers. Only after a tube successfully passes these exacting challenges is it labeled and put into stock to be used in a new product or sold to the aftermarket. Tubes not meeting these criteria are rejected to the supplier or disposed of. Small-signal tubes such as the 6922 or 6H30 used in current designs are also individually tested for internal noise, microphonics, grid current and are measured for gain. Again, inferior tubes are disposed of.

Tested, selected Audio Research tubes will often cost more than generic types offered by aftermarket vacuum-tube sellers, who may not have the technical or financial ability to conduct exacting quality-control measures. These vendors also are not likely to eliminate and dispose of inferior, poor-quality tubes. For best performance and reliability in Audio Research products, Audio Research quality-tested tubes are strongly recommended.

Audio Research tubes are selected, matched and prebiased for best performance when installed in a new or updated product at the factory. No further biasing or other measures are necessary when first installing a new-from-the-factory preamp or power amp in your audio system.

Average tube life will depend on several parameters: product type, how the product is installed, loudspeaker efficiency, room size and acoustic damping, listening habits or average sound pressure levels, A.C. line stability and purity, and other circumstances. Generally, preamplifier tubes last up to 4,000 hours, while power amplifier output tubes will last up to 2,000 hours. Near the end of their useful sonic life, aging vacuum tubes may degrade the sonic character of the product(s) they are used in. The sound may become somewhat dry and lifeless, with a noticeable decrease in harmonic richness or bloom. Bass response may be diminished, and musical dynamics may flatten out or compress. Toward the very end of their service life, tubes may become noisy, noticeable as a slight rushing sound or rustling noise. It is far better to replace vacuum tubes prior to the end of their service life, before severe sonic degradation or outright failure occur. Running vacuum tubes into failure may damage to other internal components and cause needless repair expense.

Factors which can shorten tube life include inadequate ventilation, overdriving loudspeakers at continuously high volume levels, severely fluctuating A.C. line conditions (e.g. sagging line voltage during summer peaks of air-conditioning demand), or severe interference pulses or electromagnetic interference. Power-conditioning products such as line filters, isolation transformers and the like may or may not help sonic performance, particularly when used with power amplifiers; contact your dealer for professional advice. A dedicated 15-amp or 20-amp A.C. circuit for your power amplifier is the most effective solution for power-starved audio systems.

"May vacuum-tube products be left on continuously for maximum sonic performance and listening convenience?" Audio Research recommends that hybrid or all-tube power amps be turned on just prior to listening, and turned off after listening. Generally, a few minutes of warm-up and stabilization are all that is needed to assure good sonic performance; further improvements may be noted over the next few hours of use. Since it is almost always far more expensive to retube a power amplifier than a preamplifier, it makes sense to conserve tube life. Preamps may be left on continuously without harm, but 4000 hours of tube life will be used up in only six months!

Commercial contact enhancers or cleaners should only be applied with caution to vacuum-tube contact pins. Some enhancers can actually turn into a varnish-like substance with the application of heat, and thus degrade rather than enhance sonic performance. Call Audio Research Customer Service for further guidance on specific products, or contact your dealer. Technical servicing of Audio Research vacuum-tube models should only be done by a trained audio electronic technician. Operating voltages inside these products can be lethal, and owners are advised against any tampering with internal components. Unauthorized modifications or circuit changes to Audio Research products immediately voids any protection under the terms of the 3-Year Limited Warranty. Audio Research vacuum tubes are covered by a 90-Day Limited Warranty, dated from day of purchase. Most often, vacuum tubes which become defective or are destined to premature failure will reveal these abnormalities during the first few days or weeks of use.

For more information on vacuum-tube availability and pricing, contact your local authorized retailer, call Audio Research Customer Support at 763-577-9700, or email Customer Support at [service@audioresearch.com](mailto:service@audioresearch.com).