

2A3-Mesh Emission Labs EML

Data Sheet



The EML 2A3 mesh tube is a plug & play, direct replacement for original the RCA 2A3 tube. It features a mesh window in the Anodes. This combines the mechanical stability of Solid Plate tubes, with the properties mesh materia, which is soft, and has a resonance damping function. We think this is the most ideal combination for a low power audio tube.

Guarantee program for first owner.

The first owner can register the tube at the Emission Labs website, to participate in the [5 years guarantee program](#).

Sound Character of the EML 2A3-mesh

When a tube is given mesh Anodes, something magic happens to the sound. We believe this is caused by the high damping properties of the wire mesh material. When using mesh tubes, you will experience what people call a more 'transparent' sound stage, meaning a more realistic stereo reproduction of the original sound recording. With this quality product you will enjoy the very best of what small triodes have to offer.

The EML 2A3-Meshtube is constructed for lowest microphonics. All critical parts, like filaments and grids are made of hard metal for higher reliability and reproducible quality. The tube base is now glued on the glass with anti-vibration rubber.

Where 2A3-Mesh is not advised:

- Mesh tubes used as output tubes in a separate pre amplifier, or used in a head phone amplifier, may occasionally cause a spurious noise. Though this is rare, it is not a tube issue when it happens. Otherwise we recommend the EML solid plate tubes.

EML 2A3-Mesh Filament Ratings

Filament Voltage:	2.5Volt (AC or DC)
Electronic heater modules:	Only voltage source
Tolerance on filament voltage: (See Notes 12) Also read our TB-05	4% 2.4 ... 2.6V at Tube pins 2.5 ... 2.7V at Socket pins
Filament Current:	2.5Ampere
Maximum Time on Stand By (Heater voltage only):	2 hours

EML 2A3-Mesh Maximum Conditions (not possible simultaneously)

Anode Voltage	350Volt
Anode Current	70mA
Anode Dissipation Continuous	18Watt
Highest possible Grid to ground resistor, Single Ended, Auto Bias. (See Notes 8, 11)	500kOhm
Highest possible Grid to ground resistor, Single Ended, Fixed Bias. (See Notes 8, 11)	50kOhm

EML 2A3-Mesh Factory Test conditions

Anode Voltage	250V
Anode Current	60mA
Control Grid Voltage	as needed for 60mA
Transconductance	tested at 60mA

Typical application

Singe Ended (SE) Recommended operating point
All bias methods are possible

Anode Voltage	250V
Anode Dissipation	15Watt

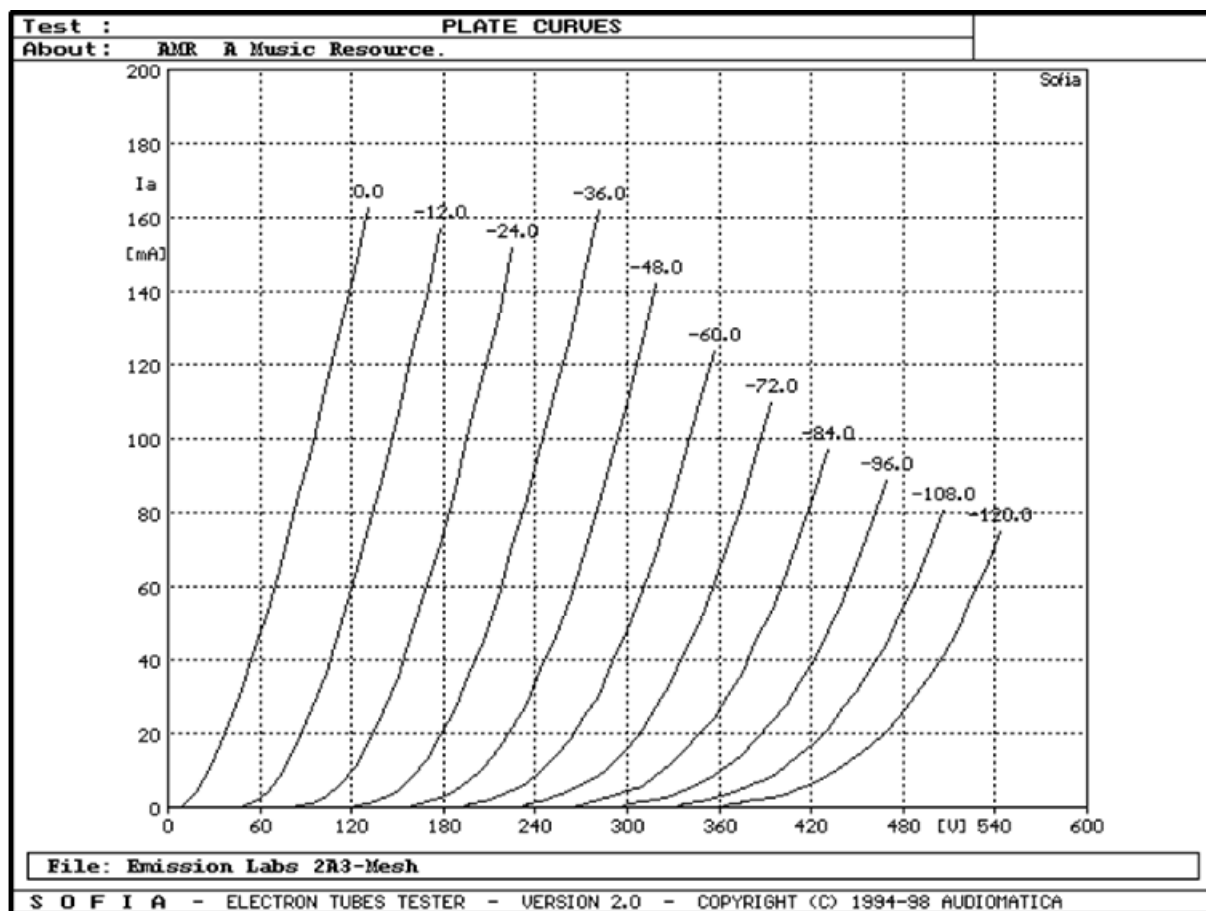
Anode Current	60mA
Control Grid Voltage	-45Volt
Anode Impedance (Rp)	800 Ohm
Amplification Factor	4,1
Transconductance (Gm)	5,2mA/V
Load Impedance (Ra)	2500 Ohm
Power Output @ Ra = 2500k	3.5 Watt

Typical application

Push Pull (PP) Recommended operating point

Auto Bias

Anode Voltage	300V
Anode Current at zero signal (value is for one tube)	40mA
Cathode Resistor (Common Resistor for one tube)	780 Ohms
Load Impedance (Raa)	5000 Ohm
Power Output @ Raa = 5k	10 Watt



EML 2A3 Average Plate Characteristics. [See Note 3](#)

EM2A3 Mechanical Data

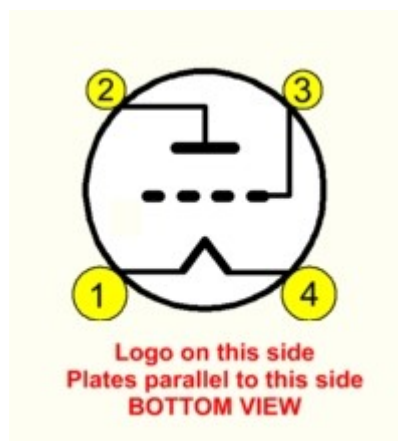
Size including Socket, but excluding pins: 147 x 60 mm

Shipment weight of one tube: 140 Gram

Shipment weight for pair in gift box: 730 Gram



Ceramic UX4 Base



Ceramic UX4 Base

Features

- **NEW** Gold Plated Grid ([Note8](#))
- **NEW** Gray Wire Mesh
- **NEW** Soft rubber suspended tube base
- **NEW** Cathode Tapped filament version available (order V4-Version)
 - Electrically compatible to vintage 2A3 tube by RCA.
 - Hard metal Construction ([Note1](#))
 - Extra large getters
 - Hand blown Glass bulb
 - Anti-microphonic Anode- and grid suspension
 - Tube printing with real gold (metal), red color is glass burned into the glass
 - Gold Plated pins, black ceramic socket. (White bottom.)

Notes

Note 1) Hard-metals like Molybdenum and Wolfram are used in EML tubes. Though these metals are more costly than classical tube nickel. At critical places, we use hard metal for better geometry. This results in best tube parameters, also after shipment. You will still find EML tubes mechanically much more stabile than comparable tubes on the market.

Note 2) Individual Test data, such as: Matching Data, Grid Current, Vacuum, Filament Current, etc., are on the Certificate that is on the outside of the tube box. Each tube is numbered from the inside, with a metal [Tag](#)

Note 3) Average Plate Characteristics are made with the Sofia Digital Curve tracer.

Note 6) Some competitors claim to be the only one with a Center Tapped filament, but this is not true. At EML we build since 2005 all triodes with Center Tapped filament ever since, not just the 300B. Such tubes which we offer in V4-Version have an electrical connection to the Cathode Tap. Thus offering a real cathode connection, but also none-V4 tubes have this center tap, but it is not connected to the socket.

Note 8) Gold Plated grids have a few advantages. Amongst other this will give better bias stability of the tube, some protection against accidental overload, better linearity of tube curves, and much reduced grid current.

Note 10) Some competitors offer what they call 'Mesh' tubes, which are no mesh tubes at all, but only give the optical illusion of this. [See our warning page for FAKE Mesh tubes.](#)

Note 11) These grid current values are the original RCA specifications, which EML also meets and guarantees. Though it can be observed that often significant higher values seem possible with old or new tubes, please keep well in mind, that the grid current creates a voltage across the grid resistor. This is a DC current, coming "from" the grid. So, the polarity of this voltage will off-bias the tube such that plate current will increase, above the intended value. In some bad cases, leading to thermal destruction of the tube. For this reason, manufacturers specify a maximum grid resistor, which value has to do with the quality of the whole tube, including clean materials, best vacuum, and safe thermal design. When tubes are new, grid current is usually at it's lowest. In order to operate safe, during the entire lifetime of the tube, these grid resistor values were specified by RCA. We adopted those values at EML, in order to prevent amplifier designers to build products around the (much better) EML specifications, but then historical tubes may sometimes fail in such an amplifier. Understanding this consequence, EML 2A3 may be used with 2x higher grid value resistors as RCA specified. So 1 Meg for Auto bias, and 100k for fixed bias. Grid current of factory new tubes is below 1uA. Rejection level for faulty, used tubes is above 3uA at 250V/60mA, and full warm up.

Note 12) Heater Voltage. Precise heater voltage is the #1 key to long tube life. Use of current source modules voids guarantee. Do not experiment with lower filament voltage, to expect better lifetime. We already specify filament voltage for the best lifetime. Heater voltage is always defined at the tubes pins itself. There may be some voltage drop along the wires, and tube contacts as well. So voltage measured at the tube socket wiring should ideally be 2.5 to 2.7V.