

# Bulb tester

DIY Documentation

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## Instruction

This work was of a hobby nature. The purpose of the work was to design and build a tester for E27 (large thread) and E14 (small thread) bulbs with the possibility of connecting an additional thread (eg GU10). The instrument is an electrical device that helps to repair (third-hand function) and test (diagnostics) a defective LED energy-saving bulb.

## Development

The task was completed in a workshop equipped with:

- a worktop
- anti-shock protection
- lighting
- soldering station
- tin
- flux
- a third hand
- scissors
- screwdriver
- drill with a stand
- a heat gun.

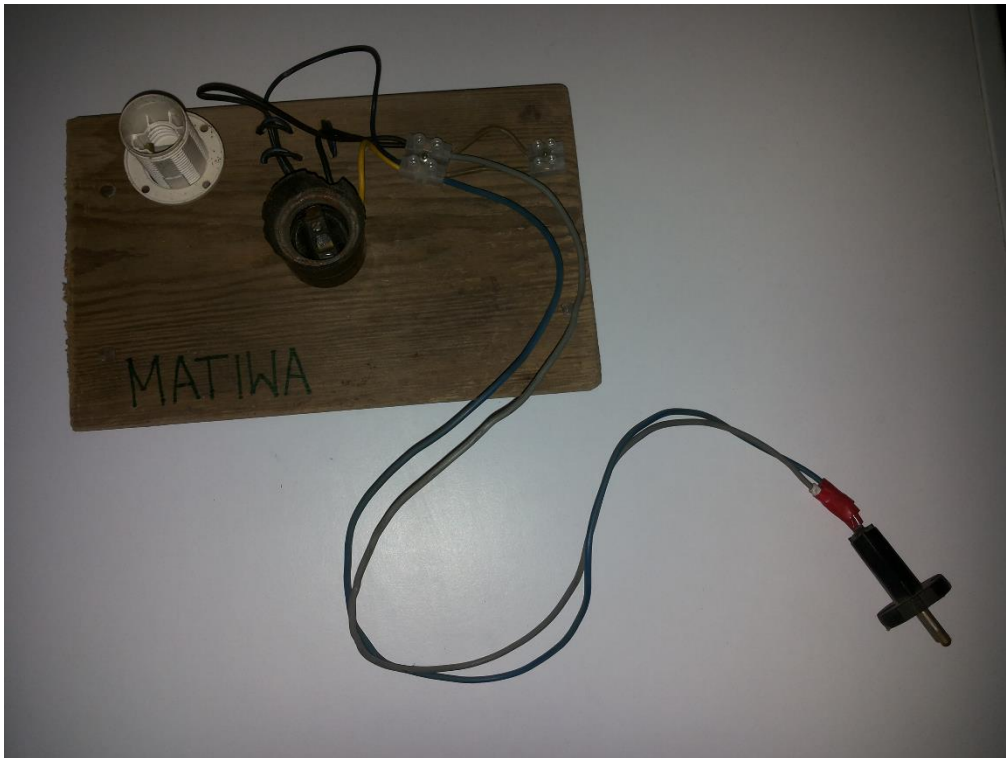
The necessary components are:

- wires
- E27 and E14 threads
- two double connectors for wires
- six screws
- a plug (unfortunately disposable)
- a heat-shrinkable sleeve
- insulation
- a board
- two strips.

The course of work:

- First, the ends of the wires were whitened, and a plug was soldered to a 230 volt socket. The place was protected with a heat-shrinkable sleeve and additionally insulated with insulation.
- Secondly, holes for the wires were drilled in the board with a suitable drill.
- Then, holes were drilled for screws, with which the board was attached to the legs. The cables were led through the holes in the board.
- Finally, the threaded wires were connected.
- As the last, the wires were screwed to the connector so that the threads for individual bulbs were connected parallel to the plug with an additional connector as a possibility of expansion.

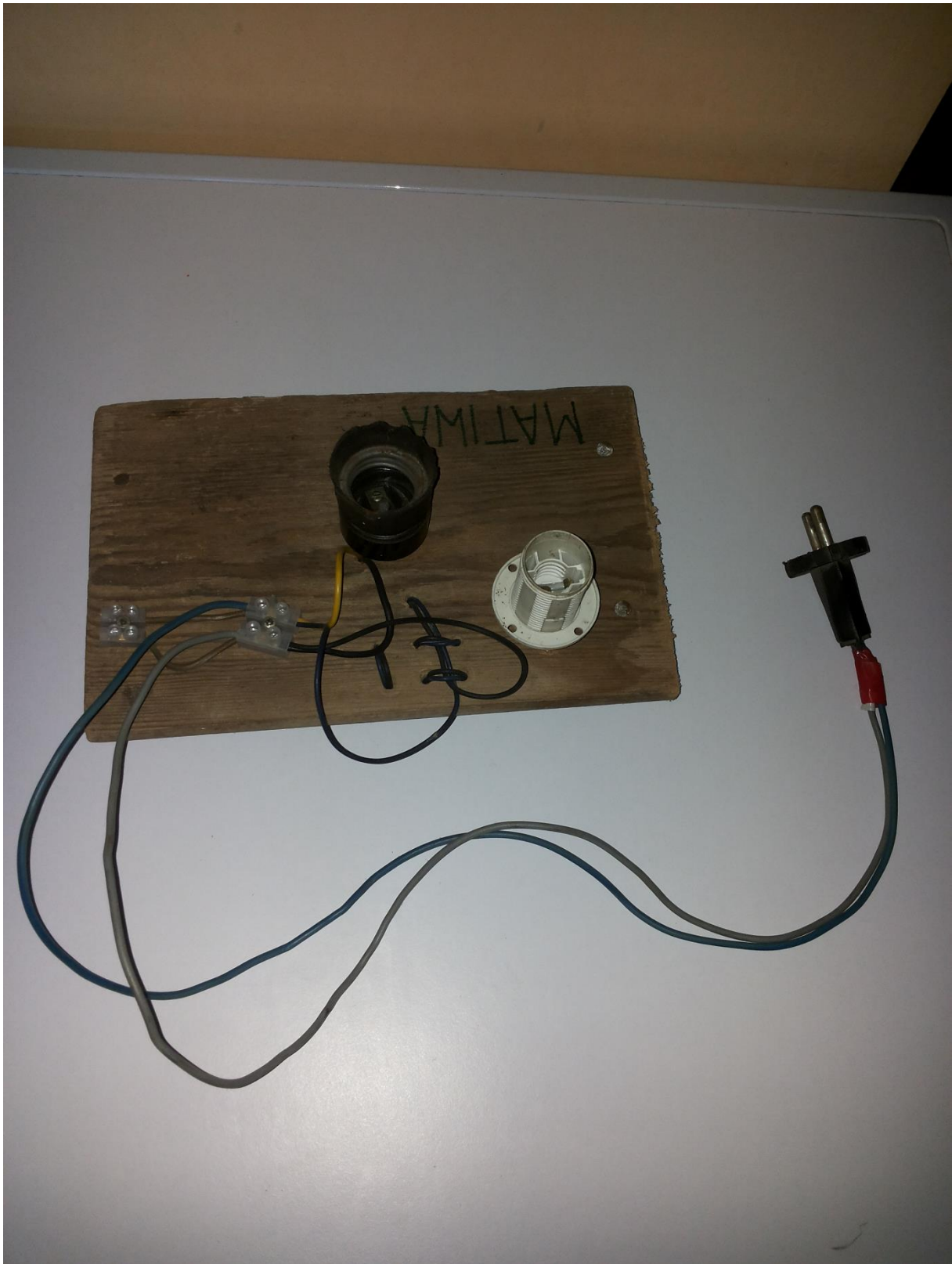
The final effect of the project is presented in the pictures below.



Drawing 1: The final result [own study]



Drawing 2: The final result [own study]



Drawing 3: The final result [own study]

Mandatory for the project were tests that were carried out for two light bulbs, as well as individually - for E27 and E14.



Drawing 4: Test for E27 and E14 bulbs [own study]



Drawing 5: Test for E27 bulb [own study]

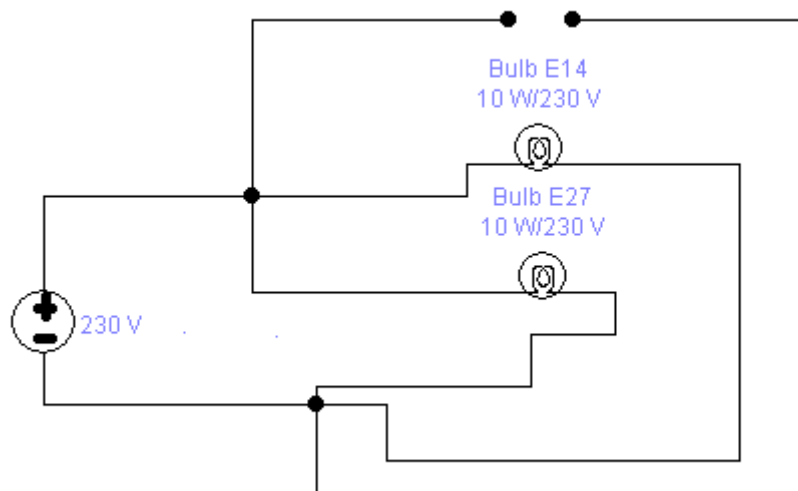




Drawing 6: Test for E14 bulb [own study]

The last two photos show that the threads are connected in parallel.





Drawing 7: Concept drawing [own study]

## Summary

- The use of the tester for E27 and E14 bulbs confirmed the efficiency of the device.
- Using the tester individually for the E27 bulb, and then for the E14 bulb, confirmed that they are connected in parallel.
- The use of heat shrink and insulation when soldering the wires to the plug provides 99.99% safety against electric shock.
- The drilled holes in the cable tray were made to avoid the use of additional cable fasteners.
- The use of an additional connector is used to connect an additional thread to another bulb, which is also connected in parallel.
- The device can be used as a tripod or a third hand to repair LED bulbs, but it must be absolutely disconnected from the mains.
- When screwing and unscrewing the bulb, the device must be disconnected from the mains.
- In the future, the designer and contractor can replace the plug from a disposable one with a reusable one and add a key switch on the cable. This would be to increase security.
- The conceptual drawing was made in the Electronics Workbench 5.12 program, but the + and - sign for the voltage source, which is the power grid, was added in Windows 10 Paint.

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