

# RoeTest - das Computer-Röhren-Messgerät -

professional tube-testing-system (c) Helmut Weigl [www.roehrentest.de](http://www.roehrentest.de)

## Comparing characteristic curves with the original data sheet

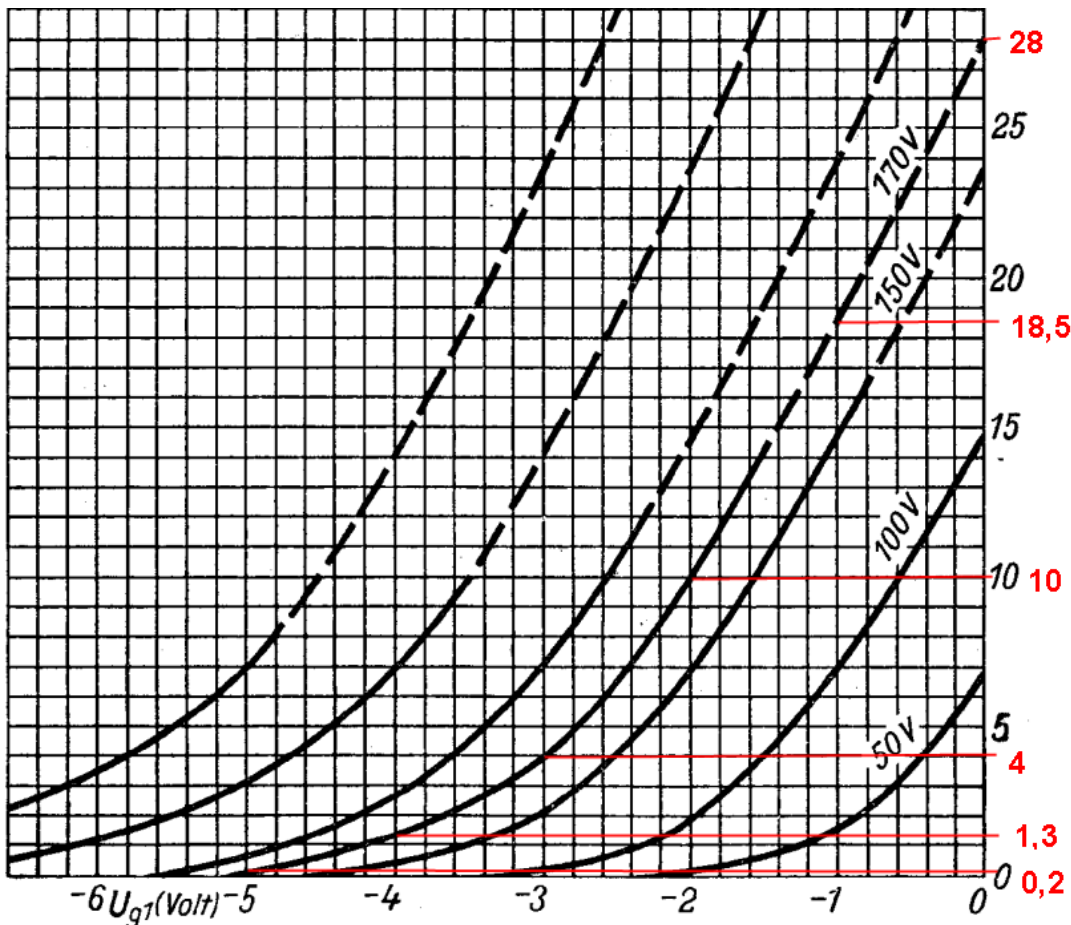
A RoeTest user contacted me regarding the following issue:

He wants to compare his tube's recorded characteristic curves from the RoeTest with the characteristic curves from the original data sheet. For this purpose he wants to scale the recorded characteristic curves to the same size as in the data sheet. Then he wants to put the two papers on top of each other for comparison.

Putting two papers on top of each other for comparison is not an optimal solution. It would be better to digitize the original characteristic curve from the data sheet and then compare the curves on the PC's screen.

Direct scanning of the data sheets is not feasible as the characteristic curves in the data sheets have different scaling. So the characteristic curves have to be transferred manually. For this purpose already a few pairs of values will suffice and this can be done very quickly.

Example EF80,  $U_a$  and  $U_{g2} = 170V$ , original data sheet:



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The characteristic curve's pairs of values are entered in the evaluation window at the item "add curve" (red marked fields), with increasing x-values ("gesendete Spannung [sent voltage]") from the left to the right. Empty fields will represent the value pair 0/-99. There is one specific peculiarity to observe: It is not possible to represent an anode current of 0mA. You have to enter a very small value (e.g. 0,01mA) instead of 0mA.

The screenshot shows the 'analyse curve' window of the RoeTest software. On the left is a graph with 'I (mA)' on the y-axis (0 to 28) and 'U (V)' on the x-axis (-4 to -1). A blue curve is plotted. On the right is a control panel with an 'add curve' button highlighted in red. Below it is a table for entering data points:

Meßwert Nr.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
gesendet:	-5	-4,5	-4	-3,5	-3	-2,5	-2	-1,5	-1	-0,5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gemessen:	0,2	0,6	1,3	2,3	4	6,5	10	14,2	18,5	23,1	28	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	

Below the table are buttons for 'delete table', 'copy ratings to clipboard', 'clipboard -> table', 'save table to file', and 'load table from file'. The 'save table to file' button is highlighted in green.

The original characteristic curve's data can be stored to file using the button <save table to file> and are then available for later comparisons. You should use meaningful file names that correspond to the underlying characteristic curve data. The file extension for the characteristic curve data file is ".rkl".

The screenshot shows a Windows file explorer window titled 'Speichern unter' (Save as) with the folder 'Messdaten' selected. It displays a list of files:

Name	Änderungsdatum	Typ	Größe
Rene	02.09.2012 09:34	Dateiordner	
EF80 datasheet WF, f(Ug1), Ua=Ug2=170V.rkl	24.09.2017 18:34	RKL-Datei	1 KB
EL84 datasheet Philips, f(Ug1), Ua=Ug2=250V.rkl	09.10.2017 13:49	RKL-Datei	1 KB
RV12P4000 datasheet Tlf f(Ug1), Ua=200,Ug2=100V, rkl.rkl	09.10.2017 13:48	RKL-Datei	1 KB

At the bottom, the 'Dateiname:' field contains '\*.rkl' and the 'Dateityp:' dropdown is set to 'Röhrenkennlinie - tube curve'. 'Speichern' and 'Abbrechen' buttons are visible.

With the button <add curve> the characteristic curve is shown in the graphics. As you can see from the characteristic curve above already a few pairs of values suffice for a suitable representation. If you want a more accurate representation you can enter additional pairs of values. This can also be

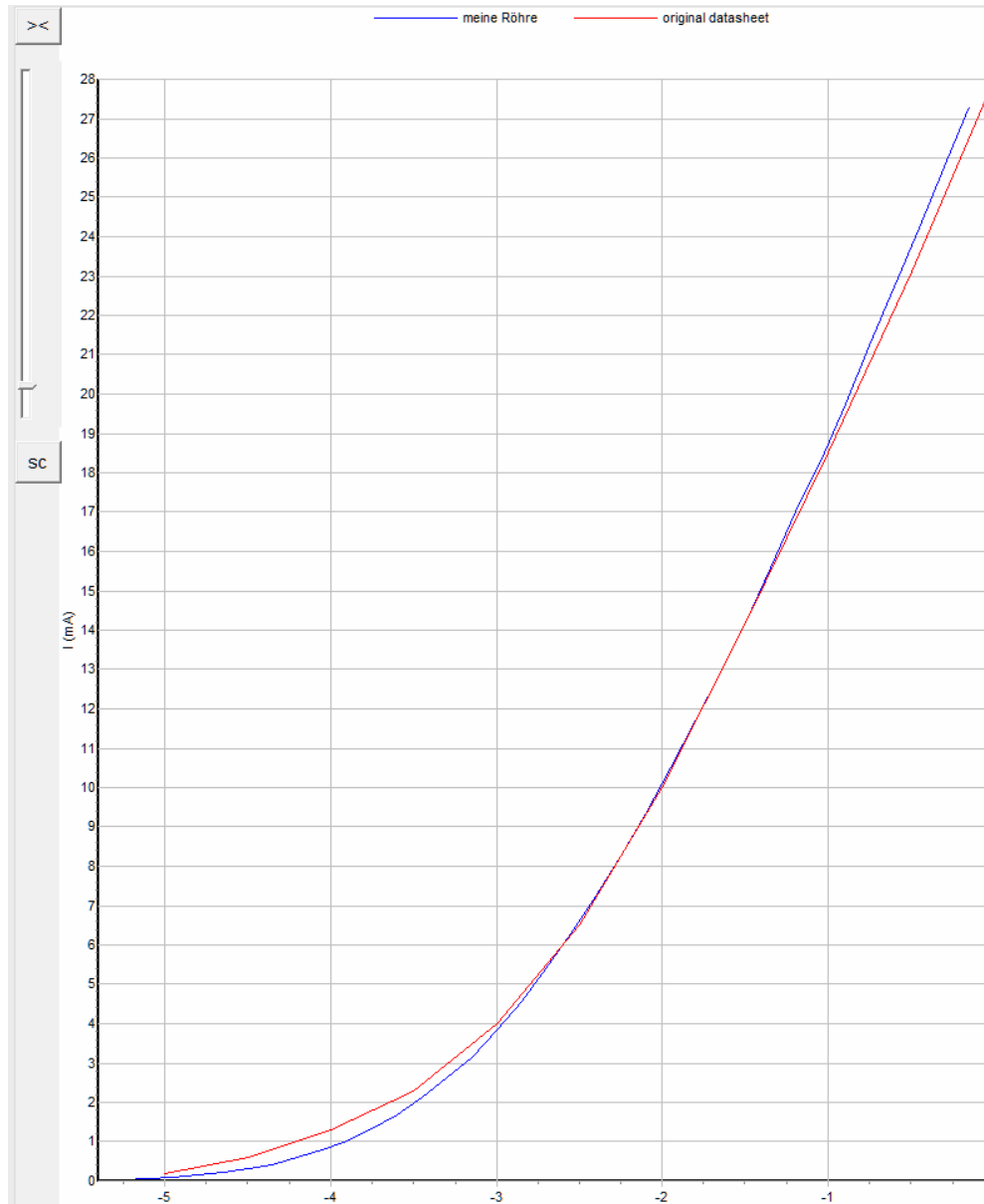
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done later using the "Insert" key at the table's current cursor position to add a pair of values or with the "Delete" key to erase a pair of values at the cursor position.

The stored characteristic curve's data can later be reloaded with the button `<load table from file>`. With the button `<add curve>` the characteristic curve is then displayed in the graphics.

The following shows the comparison of a characteristic curve from the data sheet (blue) with the tube's measured characteristic curve (red). For my tube (used, 100%) the measured curve nearly matches that of the data sheet.



The graphics can then be printed or copied to other applications via the window's clipboard.