# ONKEN CALCULATOR
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**After original research from M. Eijiro Koïzumi and Jacques Mahul and Jean Hiraga calculations.**

| Koïzumi facto | | K= | 1,57 | K= | | 45,530 | Hz |
|---|---|---|---|---|---|---|---|

*You can modify the RED value. The Green Value are calculated by the software. In many case it's for validation.*

## TS parameters

| | | | | |
|---|---|---|---|---|
| Fs | 29,000 | Hz | driver frequency resonnance | |
| Re | 6,500 | ohms | dc resistance of driver | |
| Qms | 10,100 | | mechanical Q of the driver | |
| Qes | 0,300 | | electrical Q of the driver | |
| Qts | 0,291 | | total Q of driver at Fs calculated by the software | |
| Mms/d | 77,000 | gr | total cone assembly mass | |
| Sd | 0,088 | m^2 | effective radiation area of the driver cone | |
| Rg | 0,300 | ohms | total components resistance (xover coil, terminal, wire, amplifier, etc.) | |
| Cms | 3,91E-04 | | driver suspension compliance calculated by the software | |
| Vas | 424,206 | litres | air volume driver compliance calculated by the software | |
| Vas*Qts2 | 39,304 | | calculated by the software | |
| n = | 4,271 | (best 5.7) | Onken alignment (best alignment = 5.7, Onken alignment = 6.34) | |
| | | | note : you can play with the n factor to maintain the L' vent under 30 cm | |
| | | | but try to don't used a excessive value because you don' t respect the Onken approach | |

## Box and system response

| | | | | |
|---|---|---|---|---|
| F-3 | 46,101 | Hz | box cutoff frequency at -3dB | |
| Fb | 37,157 | Hz | box cutoff frequency | |
| Cab | 11,990 | | acoustical box compliance | |
| Map | 15,302 | | acoustical mass box | |
| S vent | 408,000 | cm^2 | **this value is calculated by the vent dimension section** | |
| nO | 0,033 | | **Vas*Qts2'** | |
| dB 1w/1m | 96,825 | dB | total efficiency of the system including Rg | |

## Vent lenght

| | | | | |
|---|---|---|---|---|
| L vent | 48,283 | cm | effective lenght vent | |
| L' vent | **37,002** | cm | corrected effective vent lenght (use this lenght in your vent calculation) | |
| | | | *note : If the L' vent is over 35 cm, your driver is not suitable for the Onken speaker application* | |

## Vent dimension (habitually an Onken speaker have a S vent equal or -15 % smaller to the driver Sd)

| | | | | |
|---|---|---|---|---|
| Width | 4,000 | cm | indicate the width of one vent | |
| Height | 17,000 | cm | indicate the height of one vent | |
| Quantity | 6,000 | | indicate the number of vent you can use (Onken speaker have 6 or 8 identical vent) | |
| S vent | 408,000 | cm^2 | total vent area (try to obtain a S vent equal or maximum 15% less to the Sd) | |
| Vent volume | 15,097 | litres | total volume occupied by all vent in the box | |
| **% < Sd** | **53,636** | | | |

## Total Box Volume

| | | | | |
|---|---|---|---|---|
| Vb | **167,865** | litres | total internal volume of the box | |
| Vb Total | 182,962 | litres | total internal volume of the box plus the required volume for the vent | |