

ONKEN CALCULATOR by Cyr-Marc Debien 2000 © cdebien@cmaisonneuve.qc.ca			
After original research from M. Eijiro Koizumi and Jacques Mahul and Jean Hiraga calculations.			
Koizumi 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 resonance
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 =	6,340	(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	37,838	Hz	box cutoff frequency at -3dB
Fb	37,157	Hz	box cutoff frequency
Cab	17,799		acoustical box compliance
Map	10,308		acoustical mass box
S vent	612,000	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	48,790	cm	effective lenght vent
L' vent	34,973	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	25,500	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	612,000	cm ²	total vent area (try to obtain a S vent equal or maximum 15% less to the Sd)
Vent volume	21,403	litres	total volume occupied by all vent in the box
% < Sd	30,455		
Total Box Volume			
Vb	249,184	litres	total internal volume of the box
Vb Total	270,588	litres	total internal volume of the box plus the required volume for the vent