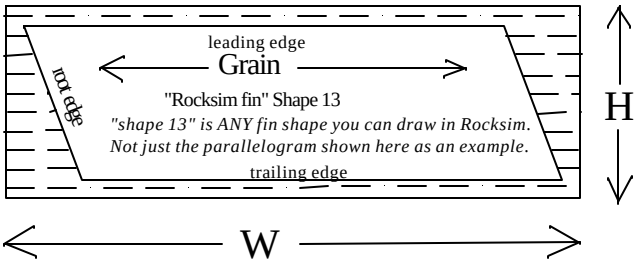
Centering rings, Motor-mounts & "Rocksim fins" for Rocket Scientists

You may want to download the BMS_Calculator .xls (Excel 5.0 spreadshhet) from the BMS website. Although you can certainly perform the calculations called for here with a calculator the spreadsheet makes it easy. Also since the spreadsheet is continuously updated it contains all the latest materials! Except for the actual order form (use the BMS semi-custom order form) everything you need to know about ordering semi-custom centering rings, motor mounts or Rocksim fins is on this one sheet of paper!



First create a physical (or mental) sketch of your ring or fin to determine the amount of raw material needed to produce it. Do this by drawing a square or rectangle around the fin or ring leaving a 1/10" border and record the "W" & "H" dimensions.

It is up to you to make sure the rectangle size you pick will contain your fin so the leading edge goes "with the grain". Of Course grain direction does not matter for Rings.

For Balsa or Basswood the "H" dimension cannot exceed 4"as Balsa and Bass are only stocked 4" high maximum. For plywood (or any other material) H can be any value up to 11.5". The maximum "L" dimension for ALL materials is 17".

Material code	Chart #13	Cost Factor	Hole adder	
M				
10	1/32" Balsa	0.0086	0.02	
20	1/16 Balsa	0.0125	0.02	
30	3/32 Balsa	0.0156	0.02	
40	1/8 Balsa	0.0247	0.03	
50	3/16 Balsa	0.0319	0.03	
60	1/4 Balsa	0.0454	0.04	
70	1/32 Birch 3-Ply	0.0598	0.03	
80	1/16 Birch 3-Ply	0.0747	0.04	
90	3/32 Birch 3-Ply	0.0886	0.05	
100	1/8 Birch 5-Ply	0.1407	0.08	
105	5/32 Birch 3-Ply	0.0660	0.06	
110	1/8 Lite Ply	0.0415	0.05	
130	1/4 Lite Ply	0.0616	0.07	
200	.050 Black cardboard	0.0313	0.02	
210	1/16 Basswood	0.0554	0.03	
220	3/32 Basswood	0.0579	0.04	
230	1/8 Basswood	0.0823	0.05	
240	3/16 Basswood	0.1138	0.06	
250	1/4 Basswood	0.1626	0.07	

Now using Chart #13 (along with the W & H dimensions you recorded) cost out your fin using the *"Fin Price equation"*

Fin cost = $4.00 + Quan desired x (H x W x Cost factor)

Note that there is a "per line item" setup fee of $4.00 per fin ordered. This pricing scheme results in significant savings when ordering multiple pieces of the same item.

Now let's run through an example for a "Rocksim fin". You have determined that your fin will fit into a rectangle of 1/8" Balsa that is 7" wide x 4" tall and that you want a set of 3 fins.

$4.00 + 3(quan) x 4"(H) x 7"(W) x .0247(material Multiplier) =$6.08 for your three fins (first fin cost $4.69 and each additional fin is $0.69).

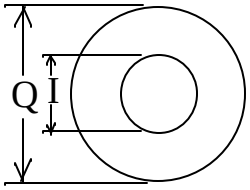
Shown below is how you would fill out the semi-custom order form for this fin. Note that the dimensions "W" & "L" are not actually entered in the form. They are rather just used in calculating the Total price. Also note that the "size category" column is used to write in the filename of the Rocksim file.

Qty	shape	Size	Q	L	M	I	T	U	A	$ ea	$ Total
3	13	File name	*	-	40	-	-	-	-	--	$6.08

* if more than one fin type in file write fin name in "Q" box. Name in box MUST match name in Rocksim file!

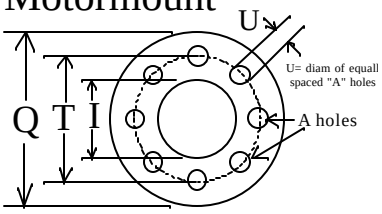
Now an example for a Motor-mount ring. Note that although Balsa stock is not shown for the rings you must leave a .1" border around part. Both W & H will then be equal to Q+.1"

Centering Ring



Shape 14

Motormount



Shape 15

Let's say you decided that you want to place 5 BT5 tubes in a BT70 with a center BT20 hole. Here is how you fill in the form. The price is calculated just like the fin. In this case "W" & "L" are both equal to "Q" which is 2.175. Using the "*Ring Price equation*" we get a price of $2.45 for the two rings. Additional rings would cost $0.72

Cost of Ring = $1.00 + Quantity desired x ((Q+0.1)^2 x Material Cost +0.2 + Hole adder x (A+1))

Qty	shape	size	Q	L	M	I	T	U	A	$ ea	$ Total
2	15	-	2.175	-	110	.736	.724	.544	5	--	$2.43

A Centering ring is specified in exactly the same manner. Just omit T, U & A. For both centering rings and motor-mounts the center "I" hole can be omitted simply by making I equal to 0.

Don't forget to download *Bms_Calculator.xls* (Excel 5.0 format) spreadsheet from our website. In addition to making things much easier it is also kept constantly up to date with the latest materials.

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