



H. H. MØRCH

Email: moerch@moerch.dk

## Cartridge/Armtube Combination List

PREC./red can be used for "green", "red" and "yellow". PREC./blue for "blue".  
There is only a small difference in effective mass between "red" and "yellow".  
For 12" armtubes "red" should be used also for "green" and "yellow".

Manufacturer	Model	Weight (g)	Recommended armtube
Acoustic Signature	Challenger	8.3	green
Ace		8.8	green-red
Air Tight	PC-1	12.0	red/green
	PC-3	13.5	green
Allerts		10.0	red or yellow
Audio Note	Soara	11.0	blue-PREC/blue
	IO	11.0	PREC./red-red
	IO II	18.0	green
Audio Technica	AT-F5/OCC	5.0	blue-PREC/blue
	AT-OC5	8.0	red
	AT-OC7/OC9	7.8	yellow-red
	AT-95E	5.7	blue-PREC/blue
	AT-ART 1	8.5	red
	ART 1	9.5	red
Audioquest	MC-5	6.0	yellow-red
Bang & Olufsen	MMC 1	1.6	green
Benz-Empire	MC-1000	7.5	yellow-red-PREC/red
Benz-Micro	MC-2/3	7.5	yellow-red-PREC/red
	Reference	8.6	green-red-PREC/red
	H 2.0	8.6	green-red-PREC/red
	Glider	5.6	yellow-red-PREC/red
	MC-Gold/Silver	5.7	yellow-red
	Ruby	8.2	PREC. Red/green
	Ruby 2	9.6	red or green
	Ruby 3	14.0	green
	LP	10.7	green
	L2, M2, H2, Ref2	9.0	green/red
	Ace	8.8	red/green
	ACEL	8.8	red
Cardas	Myrtle Heart	9.1	red
	Myrtle Silver Heart	9.5	red
Cartridge	Music Maker III	6.2	red
Clearaudio	Gamma S / Insider	10.0	Precision/red
	Accurate		green
	Concerto	4.0	yellow/blue
	Sigma	4.5	blue
	Signature	12.0	green
	Stradivari	4.4	yellow-red
	Insider	12.0	green
	Victory	8.0	red/green
Crown Jewel	Speciel Edition	8.0	yellow-red
Decca	Super Gold	6.7	PREC/blue
	Jubilee	10.0	green/red
	London Jubilee	6.7	blue-PREC/blue
Denon	DL-1000 A	6.0	green
	DL-103 D	7.5	yellow-red
	DL-110	4.8	yellow-red
	DL-304	7.0	green
	DL-S1	7.0	green-red
Dynavector	17 D2 Mk II	5.3	red-PREC/red
	23RS Mk II	5.3	yellow-PREC/red
	XX-1+ XX-1L	12.0	PREC/red
	XX-2 Mk II	8.9	red-green
	DRT XV-15	12.6	green
	DV-20X H/L	8.6	red

	DV-10X5	6.6	yellow-red
	TE/KAITORA	9.8	green
EMT	HSD 6	12.0	green-PREC/red
	JSD 5	11.0	blue
	JSD 6	11.0	blue
Empire	MC-1000	7.5	yellow-red-PREC/red
	MC-Silver	5.7	yellow-red
Garrot	P-77	5.8	red
Glanz	10 LX	4.8	blue-PREC/blue
Goldring	Eroica	5.5	blue-PREC/blue
	Electro 2	9.0	red
	MM 042	6.3	green
Grado	All SIGNATURE models	5.0	red-green
	Ref.	6.0	green
	Reference Master	6.5	green
Grado	Statement Sonato	6.5	green-red
v.d.Hul	Frog	8.2	green
	Grashopper	12.2	PREC/red
	Grashopper IV GLA	8.6	green/red
	Grashopper V	8.6	green/red
	MC 10	7.5	yellow-PREC/red
	MC 1 B		blue-PREC/blue
	MM-1/2	6.5	green
	Colibrie	6.0	green-red
	Colibrie XCP		green
	Myabi	12.3	green
	Black Beauty SPX	8.5	green
Kiseki	Purplehart	7.5	blue-PREC/blue
	Purplehart Sapphire	7.5	blue-PREC/blue/yellow
	Blue Gold Spot	11.4	yellow
	Miltek Aurora	9.6	blue-PREC/blue
Koetsu	BLACK	9.5	PREC/blue-blue
	EMC 1B	9.0	PREC/blue-blue
	Urushi	11.5	red
	Onyx	12.0	red
	Rosewood	9.5	green-red
	Rosewood Signature	6.7	yellow-red
Lyra	Argo	4.6	yellow-red
	Clavis	11.0	red-PREC/red
	Dorian	6.4	yellow-red
	Lydian Beta Blue	8.0	yellow/PREC/blue
	Helicon	8.0	green
Linn	K 9		yellow-PREC/blue
Madrigal	Carnegie One	6.5	yellow-red
	Carnegie Two	9.0	yellow-red
Monster	Alpha 1	6.5	yellow-red
	Alpha 2	6.8	red
	Alpha Genesis 1000		yellow-red
	Alpha Signance 2000	4.2	yellow-red
My Sonic Lab	Eminent	9.0	yellow-red
Mørch	DACAPO	6.8	yellow-PREC/red
Ortofon	Cadenza	10.7	green
Ortofon	Jubilee	10.5	green/red
	MC 1 Turbo	4.1	blue
	MC 15 Super II	7.0	red-yellow
	MC 20 Super II	10.0	green-red
	MC 30 Super II	10.0	PREC/red-green
	MC 30 Supreme	10.7	green-PREC/red
	MC 2000 Mk II	9.5	PREC/red only
	MC 3000 Mk II	9.5	PREC/red only
	MC 7500	11.0	PREC/red-green
	MC Windfeld	13.0	green-PREC/red
	Rohmann	9.0	PREC/red-yellow
	Rondo Bronze	10.5	green

	SPU Royal	12.8	blue
	OM 10-20-30	5.0	green
	Kontrapunkt A+B	10.0	red-PREC./red
Phase Tech	P3G	11.5	green
Shelter	501	8.1	red
	901	9.1	red
Shelter	S 9000	11.0	red
	7000	11.0	red
Shure	M97HE	6.6	
Shutter	901	9.1	red
Stanton	881	5.8	green-red
Sumiko	Celebration	7.0	yellow-red
	Black Bird	9.6	red/yellow
	Blue Point	6.0	red
	Evo III	8.3	yellow-red
	Blue Point Special	9.0	red/yellow
Supex	SDX-1000	4.7	blue-PREC/blue
Transfiguration	Axia	7.0	yellow-PREC/red
	Phoenix	7.8	yellow-PREC/red
	Orpheus L	9.0	PREC/red-red
Tsurugi		9.0	PREC/red-yellow
Xuzura	KC-REF	9.0	blue
ZYX	RS 10-20-30	4.2	blue
	R 100	4.2	blue
	R 1000 Airy 3	5.0	blue
	R 1000 Sigma S-X	5.0	blue
	Universe	5.0	blue

Also the below formula can be used to find which armtube to use for any cartridge.

$$F_{ress} = \frac{159}{\sqrt{(M_A + M_{car}) \cdot C}} \text{ Hz}$$

$F_{res}$  is the fundamental resonance of cartridge compliance and the total mass of cartridge and arm. The best armtube is the one that gives a figure of  $F_{res}$ =11-12 Hz or as close thereto as possible.

$F_{res}$  can be found by inserting  $M_A$ ,  $M_{car}$  and  $C$  into the formula, where  $M_A$  is the mass of the arm,  $M_{car}$  is the mass of the cartridge and  $C$  is the compliance of the cartridge in  $\mu\text{m/mN}$ . Should the compliance be stated differently, it is always the first factor to be used (ranging from about 5-40).

The masses of the arms are green= 4 g, red= 6 g, yellow= 8 g and blue= 14 g.

Thus if the cartridge has a weight of 7 g ( $M_{car}$ ), and the "red" armtube of 6 g ( $M_A$ ) is used, the total mass of cartridge and arm is 13 g. If above mentioned factor of compliance is 14 ( $C$ ), then 14 should be multiplied by 13 and the square root extracted. This makes 13.5 which is then divided into 159 and the fundamental resonance ( $F_{res}$ ) will be 11,8 Hz.

Thus in above example the armtube was ideal. But for instance if the above figure ( $F_{res}$ ) was too low the same calculation could be made with the "green" armtube, etc.

There is one snag about it. The manufacturers of cartridges do not always state a useful value for  $C$ . (It should be started at 10 Hz). Figures of  $C$  coming from Japan usually are measured at 100 Hz, so they should be multiplied by 1.5-2. Figures of  $C$  coming from USA often are static values, so they should be halved. Most figures of  $C$  coming from Europe are OK (stated at 10 Hz)

Also the tracking force could be used, as this usually is a function of the compliance. For instance with a tracking force of 1.9 g the compliance would be around 14. With a cartridge mass of 6 g the "yellow" armtube would do. With a cartridge weight of 10 g (and the same  $C$ ) the green armtube should be used.