Bow Observations

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The bow makes an incredible difference in ease of play and tone produced. The best are made of a rare Brazilian wood, pernambuco. With growing scarcity of this wood and the advances of technology, other materials are coming to the attention of players including other woods and a baffling range of carbon composite materials. For our better bows, we provide the weight, balance point, and a physical measure of stiffness (deflection). These parameters help remote shoppers compare the bows. One of the things we do that isn't common is to measure the stiffness of bows we stock. A caveat: quite soft bows of very high quality can feel stiff - they take less force to produce equivalent level of sound. But stiffness still gives a very good indicator of which bows to try for a particular use.

Instrument	Weight	Balance (frog)	Balance (end)
Violin	55 - 65 g	170-200 mm	9 – 10.5”
Viola	66 – 76 g	160 – 205 mm	8.5 – 10.75”
Cello	76 – 85 g	150 – 190 mm	8 – 9.5”
Bass	115 – 150 g	100 – 135 mm	

Typical weights and balance points

Violin bow weight Weights cluster around 61 g. Bows under 57 g generally prove a bit light to handle well, and those over 63 g really feel weighty. Perhaps a “standard” measure would be 61.5 g. The actual weight is only part of what contributes to the bow's feel. The balance point makes a great difference in the apparent weight. Many players pay far too much attention to weight.

Balance Players tend to develop a preference for balance. We provide 2 balance point measurements. First, the distance ahead of the frog in it's most loose position, usually around 190 mm. Second, the distance ahead of the end of the stick, given in inches. Classical players seem to like balance points around 185 – 190 mm (9.5”). Bows out to even 200 mm (10.5”) play well for many players. Stiff bows that are a bit tip heavy play powerfully and feel good, but many prove tiring for lighter players. Fiddlers tend to like them. Light bows can prove a delight, but most are quite soft playing.

Stiffness We measure stiffness with a gauge indicating deflection in thousandths of an inch. This is quite accurate and provides a quick indication of bow characteristics. Rough characteristics of bows of various stiffness:

260 to 310: Stiff orchestral bows that handle hard playing without bottoming out. Suitable for relatively flat-arch, dark sounding violins.

310 to 340: Soloist bows giving smooth sound with less percussive effect, usually giving crisp spicatto. These bows tend to be highly versatile, handling hard playing and more nuanced soft work.

330-380: Forgiving bows generally liked by advanced students and amateur players, giving smooth

and easy performance for relaxed players. Comfortable. Also used by some soloists, especially for earlier classical music. These bows are especially nice for responsive, high-arched, brilliant violins with a relatively thin tone.

380 to 420: Intermediate student bows, easy to play undemanding music, forgiving.

420 to 450: Playable by a beginner or very sensitive players.

Over 450: Often too soft, but some surprisingly good with a delicate touch.

General Bow Information

Terms

Stick = the wood or composite itself

Head = the far end of the bow

Frog - the moving ebony part

Head plate or facing - usually bone cover at the bottom of the head, generally lined with ebony

Button, adjuster or tip - the adjuster that moves the frog

Eye - decorative inlay usually of mother of pearl on the sides of the frog or end of tip

Mortise - holes carved in head and frog to hold hair; also hole allowing eyelet to reach shaft

Plug - maple block wedged into mortise to hold hair in place

Slide - movable cover over mortise and hair in frog

Ferrule - D section metal band over end of frog

Wedge - thin wood piece spreading and holding hair across ferrule

Lining - metal on frog. Half lined frogs have only the contact surface with the stick faced with metal. Fully lined frogs have metal continuing from the slide around the back of the frog

Eyelet - screws into frog and holds the frog to the stick by engaging shaft in stick mortise

Shaft - threaded steel rod extending from tip into body of stick and engaging eyelet to hold and adjust frog

Wrap - silver or other wire, thread, leather, or imitation whalebone guarding the stick from the fingers

Grip - the thicker leather swell the thumb rides against adjacent to the frog

Weight - in grams, of the entire bow generally

Balance point - measured several ways, in this shop by mm ahead of the hair-edge of the frog

Stiffness - resistance to flexing, in this shop measured with a Stroup stiffness gauge, in units of thousands of an inch

Bow stick materials Modern bow sticks are made of various kinds of wood, composite materials, and even combinations. The finest sticks are of pernambuco - a reddish wood from Brazil also referred to as Pau-Brazil. Other woods used include woods similar to or inferior grades of pernambuco loosely termed “brazilwood,” snakewood and a range of somewhat mysterious Asian woods. Pernambuco itself varies in quality. Straight grain and high density are the most desirable. The best wood sinks in water. On the other hand, more porous wood often has great elasticity, a good thing. There is some debate about the importance of totally straight grain, the presence of waves in the grain, and the orientation of the annular rings. An ideal would be totally straight grain with the annular rings pointing to the string in playing position. However, rather nice playing sticks often exhibit flaws in the wood and orientation. The most important aspect is likely how the maker compensates for minor flaws. Wood tends to break perpendicular to the annular rings, so the most serious flaw in orientation is having the annular rings running up and down the head. The head will break easily under these circumstances.

Frog Frogs are generally made of ebony. Ivory, imitation ivory, bone, fossil, horn, tortoise, and probably other things have been used. The material matters less than the construction. Except that some exotic materials shatter rather easily, something to keep in mind when shopping and playing. A fair amount of machine and hand work goes into even a simple frog. The quality of materials, design, and construction all play into whether a frog is effective or not. The frog swells at the bottom to accommodate the slide and hair, and possibly to add a little mass. The slide needs to fit firmly, but still move out of the way for rehairing. The ferrule should be cleanly made and fit well. Very important: the frog needs to seat well on the stick without wobble. Frogs may be either half lined or fully lined. The lining refers to metal around the perimeter of the frog. Fully lined frogs have metal on the bottom and back of the frog along the center line. While fully lined frogs are supposed to be better, we don't see any problem really with half lined frogs. The lining adds mass, which can be useful in balancing a bow, and looks great. We don't recommend plastic frogs.

Fittings Much is made of the material fittings are made of. Plated cheap steel lies at the bottom, handcrafted gold at the top. The highest level frogs and fittings are often made by the bowmaker for a particular bow. Most bows come with frogs and fittings either entirely or partially made by specialist producers. Playing characteristics aren't influenced by the origin, but as with instruments themselves, the aesthetic characteristics imparted by a skilled artisan with a good eye are worth something. Fittings must fit. And stay attached. That's about it for fitting functional quality. If you're examining a bow, look for the fit and finish of the fittings as well as the material. Some work on cheap bows is surprisingly crude on close examination.

Hair Virtually all bows are strung with various qualities of horse tail hair. Hair is alleged to come from Siberia, Mongolia, Manchuria, Poland, and Argentina. Stallion hair from Siberia has been touted as the best. I have no idea if any of this is true. It may all come from a few sorting houses in northern China for all I know! Players and bow makers prefer straight hair with regular structure. Violin players like very white hair while bass and cello players prefer coarse black hair. Others use a mix. We only see hair after large amounts of sorting and have no idea whether there's an inherent correlation of color and texture. Some hair is apparently bleached. I can't imagine bleach does hair any good.

Most hair comes from slaughter houses. The hair is cleaned with mild soap or detergents then dressed for use in various products. Dressing involves gathering, sorting by length, and evaluating the consistency of the bundle. The better the dressing and the more times dressed the more consistent the hair is and the better it works on a bow. Most bowmakers further sort the hair. The amount and criteria for this final dressing are very personal. We simply pull out hairs that are too fat, too thin, or kinky.

Bowhair works by holding rosin. The rosin particles stick directly to the hair material and don't require adhesion to the scales of the hair. Players talk about 'bite' - a combination of the hair itself and of rosin characteristics. Players sometimes destroy bite in hair. We're not sure how this happens. Could be damage to the hair itself or contamination. Maybe they rub the scales down or use a terrible rosin. Dirt and oil are the real enemies of bow hair. Broken hairs, which generally occur on the playing edge of the hair ribbon, are the bow's enemy, leading to warping. Dirty hair can be cleaned a couple of times before rehairing, but thin hair calls for prompt action.

A compromise exists in the amount of hair on a bow. The best tone comes from the least hair feasible for a bow. Too much hair deadens the sound and overdrives the stick. We like to have the amount of hair that gives about 0.5 mm stretch when the bow is tightened sufficiently for good playing.