Methods of Measuring Rod Action and Power

Matt Lubaway
Measurements are Only Guidelines

- Custom Wrappers vs Rod Builders.
- Custom Rod Builders need to stand out and offer more.
- Need measurements that are objective and consistent.
Measurements are Only Guidelines

- Name Brands do not meet a standard. X of 10?
- Custom Rod Builders must measure against Name Brands
- Need objective and consistent measures.

Advertised: who cares?
Manufacturers use their “own” standards

- Line Weight
- Rod Power
- Rod Speed
- Flex Index
- Angle of the Dangle
Manufacturers’ Specification

No Standardization

Manufacturers “own” standards

- Action
  - Incomplete information
  - Subjective observation

- Flex Index
  - Arbitrary slope factors
  - Requires ‘single point of NO FLEX which does not exist
Manufacturers’ Specification

No Standardization

Manufacturers “own” standards

- Action
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- Flex Index
  - Arbitrary slope factors
  - Requires ‘single point of NO FLEX which does not exist

MID FLEX
6.0 - 9.0
- Excellent performance over a wide range of conditions.
- Wide range of casting styles.
- Great combination of butt strength for fighting fish and medium flex for casting ease.

TIP FLEX
9.5 - 12.5
- “Light in the hand” feel.
- Suits casters with quicker, shorter casting strokes.
- Strong butt section (in upper line weights) for fish fighting “backbone.”
- Maximize Line Speed.

Orvis Fly Fishing
Fly Rod Flex Index

Full-Flex 2.5 - 5.5
- Protects light tippets best.
- Superior “feel” on close range cast.
- Favorite traditional action.
- Best for close range, delicate casting.
- Responds well to a gentle casting stroke.
No Industry "Power Rating" Standards

There is no standard Period!
What is considered heavy power with one may be medium-heavy with another. Hmmm!
To determine the "power" of a rod is to check its line and lure ratings.
Rods may bear a designation such as LINE WEIGHT 8-12 lb. What?
Test Testing; Trial & Error

Completely Subjective / Varying Cast Techniques

- No Two are the same
- Subjective

My Cast is Better Than Yours
The test curve of a rod is nothing more than the minimum load required to bend it through 90 degrees.

- In the picture on the right, the 30lb weight is the lightest weight that will get the rod to take up the 90 degree bend, which means that it has a test curve of 30lb.

- But that doesn't make it a 30lb class rod, does it?

- You didn't really expect it to be straightforward, did you?

- **DANGER!, you might get face-full of high-speed debris coming your way.**
Physical Breakage Testing
Snap, Crackle and Pop Method

- Observable
- Measurable results
- Not comparable

Don’t Try This at Home
1. Clamp down rod; do not let bamboo touch the table.
2. Compute Target Flex
3. Add washers on paper clip to reach target flex, measured in grams.

“Free Rod” = 108 total rod – 11 handle = 97 inches

“Target Flex” 97 inches ÷ 10 = 9.7 inches

Stiffness ratio =
Grams required to reach target flex ÷

Your Test
___ grams ÷ 9.7 = ___

<table>
<thead>
<tr>
<th>Stiffness Ratio: (grams/inch)</th>
<th>Recommended Line Weight</th>
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<tr>
<td>1.4 - 1.6</td>
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Custom Rod Builders’
Target Flex Weight Rating Test

Rod clamped but not touching table

Target Flex at 0 inches
Custom Rod Builders’
Target Flex Weight Rating Test

Target Flex = 9.7 inches*
* 9.7” as computed for rod length of 108” – handle and reel seat.

Set-up for Target Flex in Jorgensen Clamp
Custom Rod Builders’
Target Flex Weight Rating Test

Target Flex Weights = 30 grams

Stiffness Ratio = 30 ÷ 9.675 = 3.1
Recommended Line = 7
185 grains
The question that Dr. William Hanneman asked himself some years ago as he pondered why no two 5-weight rods possessed the same amount of power. After all, just what makes a 5-weight rod a 5-weight rod? At what point does a 5-weight rod become a 6-weight rod? Contrary to popular belief, there is no standard or system to quantify or measure rod power by objective means - that number you see on the side of your rod is a purely subjective rating.

Give this system a fair try. It has no opinion. It has no bias. It only measures the inherent properties of a fishing rod. The data it provides you with can be extremely valuable, provided you allow yourself the time to learn how the numbers relate to each other. At some point you learned to do this with length, weight, speed, temperature, etc., and now you can learn to do this with rod action, power and frequency.

Tom Kirkman,
Publisher/RodMaker Magazine 2005

US Cent = 38.61 grains = 2.502 grams

http://common-cents.info/glossary.htm
**Action** Where most of the initial flex in a rod blank takes place. "Fast Action" rods will flex mostly in the upper 1/3rd of their length. "Moderate Action" rods in the upper 1/2 of their length. "Slow Action" rods flex along their entire length. *See also "Progressive Action." The action of a rod is independent of the material it is made from.

AA **Action Angle** A relative measurement of rod or blank action. Originated with the Common Cents System.

DBI **Defined Bending Index** Part of the Common Cents System. Provides a quick reference to the Effective Rod Number and Action Angle (ERN : AA)

ERN **Effective Rod Number** Part of the Common Cents System which provides a relative measure of intrinsic power of a rod. A measure of the force required to load (deflect) the tip of a rod a distance equal to one third of its length.

ELN **Effective Line Number** Part of the Common Cents System which provides a measure of the mass of a fly line.

IP **Intrinsic Power** See ERN. Also expressed in units of grains in accordance with the conversion tables of the Rosetta Stone.

RS **Rosetta Stone** The basic table of the CCS which correlate AFTMA line numbers with line mass, ELN, DBI, IP, ERN, and common cents.

TP **Tip Power** A measure of the power of the tip of a rod as defined by the CCS.

WL **Weight of Line** The mass, measured in grains, of a fly line required to deflect a fly rod a distance equal to one third of its length in accordance with the CCS.
“Total Rod” = 108 inches

“Target Flex” = 1/3 Total Rod length
108 inches ÷ 3 = 36 inches

1. Level first foot of rod near handle / butt.
2. Clamp down rod on a bookshelf; do not let rod touch the table.
3. Compute Target Flex
4. Add Common Cents into ‘baggie’ to reach target flex, measured number of cents.
5. Use Conversion Chart at left for ERN.

Effective Rod Number (ERN) Part of the Common Cents System.

Note: 6 WT rod number = 6.00 to 6.99 ERN
6.5 average

Table B

| Conversion of Cents to Effective Rod Number (ERN) |
|---|---|---|---|---|
| Cents | ERN | Cents | ERN | Cents | ERN |
| 10   | 0.61 | 28   | 3.12 | 46   | 5.79 |
| 11   | 0.70 | 29   | 3.27 | 47   | 5.94 |
| 12   | 0.79 | 30   | 3.42 | 48   | 6.08 |
| 13   | 0.89 | 31   | 3.57 | 51   | 6.49 |
| 14   | 0.98 | 32   | 3.72 | 52   | 6.62 |
| 15   | 1.12 | 33   | 3.86 | 53   | 6.76 |
| 16   | 1.28 | 34   | 4.01 | 54   | 6.89 |
| 17   | 1.44 | 35   | 4.16 | 55   | 7.03 |
| 18   | 1.60 | 36   | 4.31 | 56   | 7.15 |
| 19   | 1.77 | 37   | 4.46 | 57   | 7.28 |
| 20   | 1.92 | 38   | 4.60 | 58   | 7.40 |
| 21   | 2.08 | 39   | 4.75 | 59   | 7.53 |
| 22   | 2.23 | 40   | 4.90 | 60   | 7.65 |
| 23   | 2.38 | 41   | 5.05 | 61   | 7.77 |
| 24   | 2.53 | 42   | 5.20 | 62   | 7.90 |
| 25   | 2.67 | 43   | 5.35 |         |
| 26   | 2.82 | 44   | 5.50 |         |
| 27   | 2.97 | 45   | 5.65 |         |
Quick Tips - Pegboard

Rod Blank Holder & Leveling
Custom Rod Builders’
Common Cents System

Leveling - First Foot

Zero In the Rod Blank
Custom Rod Builders’
Common Cents System

Zero In the Rod Blank

Measure Cents in Advance (10)
Custom Rod Builders’
Common Cents System

Steel Indicator Wire Tied to Tip

Full Rod Deflexion (1/3)
Custom Rod Builders’
Common Cents System

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Action Angle - degrees

below 59   Rod Action
59 - 63    Slow
63 - 66    Moderate
above 66   Moderate/Fast
Fast

Action Angle, (AA)
Defined Bending Index  Part of the Common Cents System. Provides a quick reference to the Effective Rod Number and Action Angle

(ERN : AA)

Example:

\[
\text{ERN} = (30 \text{ cents}) = 3.42 \\
\text{AA} = 49^\circ
\]

\[
\text{DBI} = 3.42 : 49^\circ
\]
Custom Rod Builders’ Common Cents System

This tells you MORE.

Plot your own rods against the competition

This tells you MORE.
Custom Rod Builders’

COMPLETING THE COMMON CENTS SYSTEM

✓ The Big Picture.
  Diagraming the ERN over entire rod – every 12 inches.

✓ The Rosetta Stone.
  Fly Rod and Line values together in the a reference chart.

✓ The Fly Line Analyzer.
  Measure and standardize the fishing line, too.

✓ Rod Frequency and More.
  Wiggle horizontally; magnitude, cycle, min / max, and resonant frequency.