R&D Q&A

SELECTING COMPONENTS NUMBER NINE

PERSONAL BEST

Today's cycling enthusiast is faced with an almost overwhelming number of choices regarding his or her cycling equipment. How do you know which components are right for you and your style of riding?

In the '60s and '70s cycling materials were limited to steel and aluminum. Bicycle frames were primarily made from high-tension or cromoly steel. Bars, stems and seat posts were made from aluminum. A lightweight road bike made in the '70s weighed about 24 lbs. And mountain bikes didn't even exist in the beginning of the decade. Life was simple and bikes were built to last.

Things change in this high-tech world, however, and often they change for the better. To remain a savvy consumer we have to keep up with the latest developments in materials and technology. But between work, home and trying to keep up on the latest developments in material science, when do we find time to ride?

Well relax. Today's R&D special report is going to help take the mystery out of choosing the right component. After you read this article you will have a better understanding of contemporary component materials and how they relate to your riding style.

First the basics. In prior R&D technology reports we have talked about materials and their mechanical properties.

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Strong vs. Tough

To most people the term strength is all encompassing. It means they can ride as hard as they want; they can over-tighten as much as they want; they can crash more and the part will last forever. These characteristics, however, are actually a function of two properties: *strength* and *toughness*.

Strength is the material's ability to carry a load. Toughness is the material's ability to withstand abuse.

A material's toughness is related to its strength characteristics. Usually, the higher the strength the tougher and more durable the material — but not always.

Take glass as an example. Glass is very strong but would not make a good handlebar because it is not tough. The brittle nature of glass would also disqualify it as a good choice of material for a bar, stem or seat post. On the other hand, rubber is very tough and durable but lacks strength and rigidity. Sliding the scale to either extreme doesn't produce the combination of properties needed for a good component.

Is Tough Enough?

A material's toughness is closely related to our third property — weight. Most cyclists lust after the lightest components available. In a perfect world, components would be strong, tough and light. In reality, however, toughness improves primarily by increasing weight.

"Typical" Riding Conditions

All reputable bicycle component manufactures design with strength, toughness/durability and weight in mind. People often ask if there are rider weight restrictions for bicycle components. In general, the answer is "no". By and large

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components are over designed in terms of strength. They are meant to be suitable for any size person — under "typical" riding conditions. But if this is true, then what goes wrong when a component fails?

Assuming the component was installed properly, failures can generally be attributed to a poor choice of component for a particular riding style or ability.

If strength alone were the answer, nothing would ever break. Extensive testing shows how much force is required to break a component. As long as load is applied under "typical" riding conditions, the components strength is more than enough to keep mere mortals from breaking a component. On the other hand, the loads generated during a crash are substantially higher.

Accidents Happen

Crashes where rider and bike bounce down the hill or road can generate very high loads that can break almost anything. (Rule of thumb: if it can break your leg, it can break your handlebar.)

Also, many components exhibit more strength in specific orientations. This is particularly true of composite components where the laminates are designed to counter the forces of normal riding. Crashes can stress these components in directions that they were not designed to withstand.

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Proprietary Properties

Weight is a factor that can be controlled. By adding additional material to the product we increase the products wall thickness, strength and durability.

Easton makes handlebars for a wide range of applications and riding styles. Riders can choose between more affordable aluminum bars and state-of-the-art composite bars in a variety of styles and weights.

For example, Easton makes composite cross-country bars in both 99 and 125 gram weights. While the material is the same (carbon fiber), the wall thickness is different. The heavier bar with its thicker walls withstands hard knocks better than the thinner-walled 99 gram bar. Both bars are very strong but the heavier bar is tougher. Why make both bars? Because each bar is designed for a different style of riding.

The 99 gram bar is ideal for the weight-conscious, elite cross-country rider who maintains control of his bike (for the most part) and is generally easy on his/her equipment. 99 gram bars rule!

The heavier handlebars are designed for those epic riders — all mountain, free-riding sorts — that do not believe in brakes as long as they have suspension. These riders frequently attempt to prove that certain impossible to ride sections of the trail are actually possible. As such they tend to eat a lot of dirt and have quite a few scars. These gonzos need more than strength. They need toughness.

Use-Specific Tubes

99 gram Easton EC90 XC bar

150 gram Easton MonkeyLite XC bar

225 gram Easton MonkeyLite DH bar

Cross-sectional views of popular Easton composite bars illustrate the pronounced variations in wall thickness needed to accommodate different riding styles.

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So, if you're the adventurous sort that blazes new trails and tends to leave the bike a lot. Aluminum or thicker-walled carbon bars will work for you. If you are more the elite cross-country rider that finesses the trails you can choose a lighter bar regardless of materials. This advice applies to other components as well: seat posts, stems, forks, etc.

The bottom line is that while there are a lot of components available, it is important that you choose the right one for your intended riding style. One size does not fit all.

Charting Your Choice

Consult Easton's chart below to determine which bar (or seat post) best suits your riding style and budget. Riding styles are listed across the top of the chart; cost increases from bottom to top.

Components that fit your riding style