**HANDLEBARS TESTED TO THEIR ULTIMATE LIMIT**

*A handlebar that breaks apart possibly is the worst thing that can happen to a Mountain Biker. It is a pity you cannot see how durable a handlebar is, though, which is why we have tested 17 handlebar/ stem combination.*

It is this first sip that tells you whether the milk is sour or not. While it looks white and appears to be fine, the taste can be a bitter disappointment. What counts for milk, counts for handlebars, too. The only difference is that the sour taste of bad milk is not even close as dangerous as a broken handlebar. You have no chance to reassure yourself whether a handlebar still is ok or whether it is not. This is not only true for the different models of handlebars by different brands on the market, but even for the manufacturing tolerances within the very same production series of the very same handlebar. The following test shows this alarmingly: 17 handlebar/ stem combinations for Cross-Country, Marathon, All-Mountain and Enduro riding with widths in between 705 and 780 mm have been tested. The range of handlebars includes all different types such as aluminum handlebars as well as carbon fiber ones. Even a handlebar with the all-new 35mm diameter standard is represented. In order to investigate the quality differences within one production series of the same handlebar, three models each were sent to the independent test laboratory ZEDLER in Ludwigsburg. The first surprise was unveiled in the EN test already, a test that is much less challenging for the material than real riding impacts. What no one expected was that a handlebar could possible not pass this test, yet the reasonably priced Ritchey Trail handlebar made from aluminum in combination with the WCS stem broke. The attempt to justify this by Ritchey with the statement that handlebars may only be combined with stems from within the same price range is hardly satisfactory. As to the manuals, all handlebars and stems tested may be combined with any part on the market. The fact that a relatively heavy aluminum handlebar breaks first is surprising, in particular as the common opinion still is skeptical towards carbon fiber products. Carbon fiber handlebars appear to be more fragile with regard to the clamping sections of the breaks and shifters and may only be mounted with torque meters. Aluminum handlebars, on the other hand, are likely to cope better with crashes und need to be replaced less frequently. In order to verify this thesis, the EN test was followed by another two tests (see info box on page 70). The tests featured close to reality, mixed impacts on the material and even simulated crashes.

The results are striking: only 8 out of 17 handlebar/ stem combinations coped successfully with more than 150.000 load changes. Most strikingly, you just can not say whether you got a good and reliable model of the brands' manufacturing lines or whether you did not. Within the 8 models that survived the test, all different materials are represented: three times carbon fiber (Syntace, Enve, Answer), three times aluminum (Syntace, Race Face, Richey WCS Trail), titanium (Thomson) and a carbon fiber-aluminum combination (FSA SL-K). The most reliable material, however, appears to be carbon fiber despite numerous crashes that had been simulated. With two times one million load changes, the Syntace carbon fiber handlebar tested the testers' patience. Which potential there is in a carbon fiber handlebar is reflected also in the CTW-scale- This scale displays the weight/ durability ratio and shows, how effective the material itself is used in the manufacturing process. Carbon fiber is unsurpassed in this category.

As impressive as the potential of carbon fiber appears to be: the manufacturing process itself is key for a good product. Yet the purchase of buying a handlebar can be a pure lottery. Whoever wants to buy a Truvative Jerome Clementz bar for example, has no clue whether they bought a version that is good for some 630.000 load changes or one that may break after 30.000 already. The challenge for the quality management with carbon fiber is the right balance between weight and stability. The super light, narrow Cross Country handlebars underline this, where none of the tested bars stood more than 65.000 load changes. The assumption that for a Cross Country bar, the stress is not as high as for an Enduro bar is simply wrong. As the race courses get successively more technical, the suspension travels did not adapt. For someone who does not want to give up the idea of a sup 200 g handlebar will make a good choice with the carbon fiber combination by Enve. At under 200 g with a width of 745 mm, it was still able to pass some 300.000 stress loads.

A short glimpse at a test from 1999 still shows a positive development. The handlebars from back then in average were 8.5 cm more narrow and yet about 80 g heavier. Despite the wider handlebars today that lead to less stability, 59 % of today's handlebars passed the 100.000 stress load hurdle, while back in 1999, only 46 % did. The danger of drinking sour milk does exist anyways.

**Conclusion by Peter Nilges, BIKE-Test-Journalist**

If someone wants to play the safe card, they won't have a choice but have to go with Syntace. This counts both for their carbon fiber and for their aluminum handlebars. With the quality assurance of Syntace, they take a special position. Let aside some exceptions, a lot of carbon fiber handlebars were not able to live up to the industry standards. As a result of massive tolerance variations, you can never be sure whether you have bought a good handlebar or whether you have not. The potential of carbon fiber is huge, but manufacturers will have to handle it more carefully in the future.

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**"Our testing facilities run 24/7." Interview with Jo Klieber, CEO and R&D at Syntace**

**The handlebars you offer are the benchmark for all other manufacturers. What do you do different compared to your competitors?**

Despite the fact that we design lightweight products, we do not go all the way to the limit that would threaten our own safety standards. We test exclusively on the toughest testing facilities on the market, most likely, we do this more than others. In numbers, this means that we have tested some 7824 handlebar/ stem combinations as of today. What eventually leads to a redesign of our prototypes are findings that are related to close to reality circumstances rather than one-dimensional findings derived from a single break or from theoretical calculations. Our carbon fiber handlebars could be designed lighter, yet we incorporate the right amount of safety into our products which means that we apply more and better fibers in the right places. We also test every single production line and do not rely on ambiguous tests taken every now and then. We have been doing this for more than 15 years. 15 years of continuous safety, it does not matter when you have bought your handlebar, it will be light and safe.

**The tolerances, meaning the differences between handlebars of the same model and brand, have been alarmingly huge. Where do these differences come from? Is carbon fiber the actual material of choice for handlebars?**

Producing a carbon fiber handlebar is a lot of manual labor and an entire series of chemical processes. This is a lot of investment into a handlebar. Another point is that carbon fibers can be stressed in one single direction only. Stressed from another angle, they are less durable than one might think. Carbon fiber looses its strength by 50 percent when it is hit by a stress with no more than 20 degree already. When looking at the multidirectional requirements of Mountain bike components, they simply have to be designed differently from what you learn in theory. Trial and error is what we have done for ages, understand and explain findings and reintroduce them in our product lines. The more complex a material is, the more research and development needs to be done.

**Why is there no 35 mm diameter in the Syntace portfolio?**

The reason is simple. Even at 31,6 mm, handlebars do not break at the conjunction of handlebars and stems any longer, it no longer is a hotspot. This is true both for findings in the laboratory and in real life riding.

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**Syntace Vector 7075/ Megaforce 2**
**www.syntace.de 82 Euro/ 118 Euro**

With some 309 g, the Vector 7075 is not exactly a superlight handlebar, however it can convince with an impressive width of 780 mm. If someone does not want to go with a carbon fiber handlebar, they will not find an alternative to the Vector. With 400.000 load changes, it declassified the competitors by far, if only there was not the carbon fiber version of Syntace itself.

**Handlebar (Aluminum)**

Weight/ Width: 309 g / 780 mm
Rise/ Degree: 9 mm / 9°
Max Rider Weight: no limit.
Can be shortened to: 640 mm

**Stem (Aluminum)**

Weight/ Length: 120 g / 50 mm
Ascent: 6°
Clamping Standard: 31,8 mm

**Laboratory Findings:**

Handlebar/ Stem 1: DIN EN14766: approved
Handlebar/ Stem Multiload Test: 446203 load changes
Handlebar/ Stem Multiload Test: 416811

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**SYNTACE Vector Carbon/ Megaforce 2**
**www.syntace.de 188 Euro/ 118 Euro**

The moment, both versions of the Vector Carbon passed the 1.000.000 load changes benchmark, the test was interrupted; the handlebars are indestructible and simply blocked the testing facility. At this point, the handlebars with a width of 760 mm had spent three times as long on the stress test apparatus as the best carbon fiber competitor and twice as long as the Vector made from Aluminum. The Vector Carbon certainly is the safest handlebar on the market.

**Handlebar (Carbon Fiber)**

Weight/ Width: 227 g / 760 mm
Rise/ Degree: 10 mm / 10°

Max Rider Weight: no limit.
Can be shortened to: 640 mm

**Stem (Aluminum)**

Weight/ Length: 127 g / 60 mm
Ascent: 6°
Clamping Standard: 31,8 mm

**Laboratory FIndings:**

Handlebar/ Stem 1: DIN EN14766: approved
Handlebar/ Stem Multiload Test: 1.000.000 load changes
Handlebar/ Stem Multiload Test: 1.000.000 load changes