

Report on the Breaking of a Girth-Hitched Sling, prepared by Mammut Sports Group.  
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Recently a girth-hitched Mammut 8mm Contact sling was broken in what was described as a relatively static, low-load application. The climber sent an email to many of his friends warning them of the possible danger of girth hitching the newer skinny slings, which quickly made its way around the inboxes and internet forums in the US.



Above: The anchor and the broken sling in question.

After conducting a series of tests using static, dynamic and cyclic load testing to attempt to reproduce the conditions of the accident the broken sling was compared to the broken test samples using a microscope to examine the break characteristics, which are indicative of the mechanism of breakage. The broken sling did not exhibit any sign of chemical contamination, there was no melting of the fiber ends as is always the case in slings broken under load, the break was located outside the girth hitch rather than inside as would be expected if the knot were the source of the weakness, and the linear break very closely matched those achieved by cutting in the test samples.



Above: A sling that was cut with a knife on the left, next to the broken sling.



Above: Typical examples of breaks caused by a dynamic load (left), being cut over a sharp edge during an impact (middle), and the melting of the fibers that occurs when broken under load.

Based on this and previous testing, climbers should be aware that the strength of any slings that are connected with a knot can decrease over 50%, regardless of size.

However, based on the fact that a UIAA certified sling holds at least 22kn (roughly 5000lbs), when girth hitched 880DaN or 2000lbs strength should remain in the worst case. With normal human weight and under the described circumstances of the accident, this force could only have been reached with a multi-meter drop. Because of the lack of melting and the lack of similarity to any of the tested breaks, we do not believe the sling broke due to any force applied to it, even taking into consideration the weakening effect of the girth-hitch. The most plausible scenario, borne out by the linear characteristics of the break and location of the break outside the knot, is that the sling was cut with a very sharp object. The only difference is the pulled thread—it seems plausible that this thread could have been the only one not cut through and therefore it held the anchor in place so it appeared to be intact, and finally it broke under a relatively low load.

Climbers should be aware that all slings, whether skinny or fat, Dyneema/Spectra or Nylon, are susceptible to significant strength loss due to a girth hitch, and should use any connecting knots with extreme caution. The safest way to obtain a longer sling is to carry and use a longer sling in the first place, rather than connecting them at all. If two slings must be joined, the strongest way to do so is with a carabiner.

Further information on this test report can be accessed on the Mammut website under [Technology>Harnesses>Sling Report](#).