

BRITISH MOUNTAINEERING COUNCIL

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TECHNICAL COMMITTEE MEMORANDUM TCM 05/01

Snapped Mammut Rope

Incident ref: 04/09/B.NIC

SUMMARY

Rope was used after storage and reported to have snapped whilst climber demonstrated how easy it was to hold a fall to a novice.

Damage was found to be caused by **sulphuric acid**.



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1. INTRODUCTION

Whilst demonstrating belaying technique to a novice climber the owner tied in to the end and climbed several feet off the ground. He then clipped some gear and jumped off. The rope snapped and the climber hit the ground. The rope was described as being in good condition and not very old.

2. ANALYSIS

The rope was examined and although marked as being 50 metres was found to be only 38 metres long with only one marked end supplied. The site of the breakage was stained yellow on both pieces. This staining was repeated approximately every metre along the ropes length and the non marked end was found to be stained and appeared to be broken.

The end of the rope reported as broken was placed in a dish of distilled water and the Ph found to be 1. A slightly acidic solution of barium chloride was added to the water and a white precipitate appeared (this is a standard test for sulphate ions).

One of the stained areas on the rope was noted, photographed and tested. When this area of rope was tugged a white dust was released. When it was tensile tested the strength was found to be 240N (approximately 24kg). Another stained area exhibiting less obvious damage was found to have a tensile strength of 4.1kN – well below that expected for a rope of this type (normally in excess of 20 kN).



3. DISCUSSION

It is certain that this damage was caused by sulphuric acid and probably occurred whilst the rope was coiled. It is well known that sulphuric acid and polyamide do not mix well and this type of damage is invariably fatal to the polymer.

The owner of the rope has been questioned and believes that the rope can not have been contaminated by acid.

4. CONCLUSIONS

The only common source of sulphuric acid available to the general climbing public is car batteries and ropes should **never** be stored or carried in a location where a car battery may have also been placed. Even sealed for life batteries can leak if cracked or during charging.

Use of a rope so obviously stained can only be described as foolish and climbers should be reminded to check their equipment regularly. We can only be thankful that the climber was close to the ground when this demonstration was performed as the consequences could have been much worse if he had been much higher.