Mountain Engineering II, Inc.

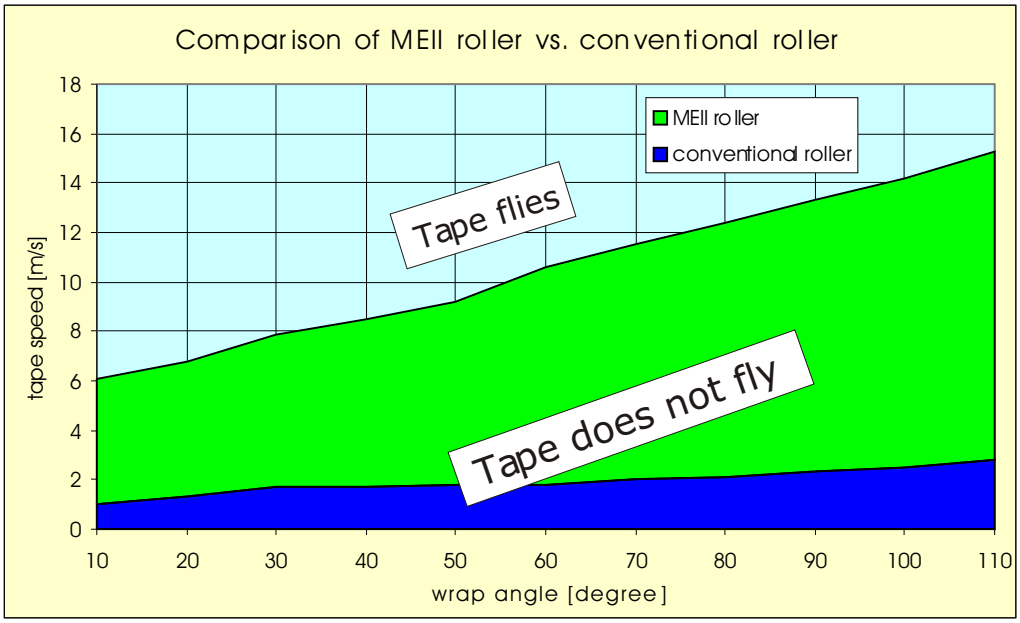
High Speed Roller

Rollers have been used for many years in magnetic tape recording devices because of their ability to guide tape very gently. Rollers cause far less tape wear than do hydrodynamic bearings, resulting in a significantly extended media life.

In addition, tape tends to stick to hydrodynamic bearings in hot and humid climates. Rollers do not have this 'stickage' problem.

When moving tape at high speed, an air film develops between the tape and the roller, so that the tape flies over the roller. This causes an instability of tape that persists at the Read-Write head. High-speed tape instability is the reason why rollers have only been used at low and medium tape speeds.

Mountain Engineering II, Inc. (MEII) has developed a roller that prevents the air film from developing. Even at very high speeds, the tape can remain in contact with the roller.



The graph compares the MEII roller with a conventional roller. The speed at which tape flies over the roller depends on the wrap angle of the tape around the roller. For example, at a wrap angle of 10° ,tape will fly over a conventional roller at about 1 m/s. At the same wrap angle, tape will fly over the MEII roller at 6 m/s. At an angle of 100°, a conventional roller remains in contact with the tape only up to a speed of 2.5 m/s. The MEII roller, meanwhile, is able to maintain contact with the tape even at speeds exceeding 12 m/s.

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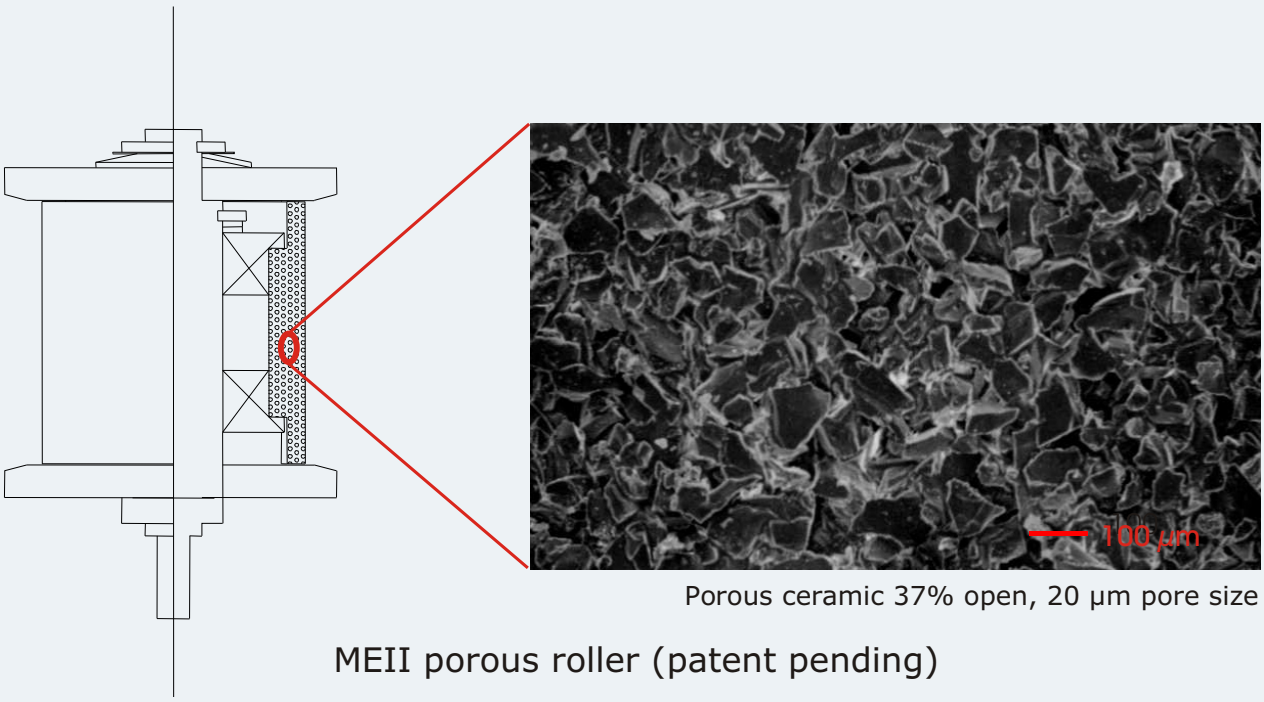

Porous ceramic 37% open, 20 µm pore size

MEII porous roller (patent pending)

The spool of the MEII roller is made from porous material. The air dissipates through the spool surface before an air film can develop. Even at high tape speed and at a small wrap angle, tape will remain in contact with the roller surface.

The pore size is less than 0.2 mm. The spool surface appears completely smooth. No tape damage will result from the porous material even if tape remains wrapped around the roller under high tension and for an extended time.

The MEII roller technology can be used with: rollers with no flanges, rollers with fixed flanges, and with rollers with spinning flanges. The wall thickness of the spool can be kept to a minimum, resulting in a low roller mass. The roller diameter can be manufactured to individual specifications.

Several materials are suitable for the porous roller: porous ceramic, porous plastic, and porous metal.

MEII will work with users and their manufacturers to design the roller to precise specifications..

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