

# Cool runnings

*No lubricants are allowed in a sport that is known for fighting friction.*

The Olympic Winter Games are being held in Vancouver, Canada, this month and I can't help but be reminded of when my hometown of Calgary hosted the event in 1988. That year history was made with the inclusion of Jamaica as a competitor in the bobsleigh events.

Seen as a novelty, the Jamaican team quickly became fan favorites. They warmed the hearts of the entire bobsleigh community, as one of the other teams provided them with a backup sleigh to allow them to qualify. Sadly, a driver error about 43 seconds into a nearly one minute course caused their sled to overturn, guaranteeing a last-place finish. Undaunted, the Jamaican team emerged from their sleigh and walked it the rest of the way down the course. At that moment, they received more applause than for any of the other teams.

The gold medal that year was earned by Switzerland, whose aggregate time from four heats was a total of 7/100ths of a second faster than East Germany's.

A four-man team is allowed to sprint and push for 50 meters of the 1,450-meter track, achieving nearly 25 mph before entry. As the bobsleigh descends the track, it exceeds 90 mph in some sections, with riders experiencing up to 5 G of force when stopping. The team's success is achieved by having a strong sprint, good entry into the sled and good steering to find the balance of the fastest path (higher into the curves) with the shortest path (lower into the curves). However, having a good sled can be pivotal.

Several factors play into a successful bobsleigh design. A sled is made of a fiberglass body on a steel frame, with fixed and collapsible push-bars, fixed and movable steel runners and a serrated metal brake on a lever. The sled must be at least 463 pounds when empty, but less than 1,389 pounds with crew and equipment.

The sled is built to minimize drag due to air passing over the body, with the runners being the next most important consideration for reducing friction. The Fédération Internationale de Bob-sleigh et de Tobogganing sets very stringent rules regarding their design. Unlike the blades of a skate, which are hollow ground to produce two edges, sled runners must be blunt. The concavity of a

skate blade holds water under the blade to act as a lubricant; essentially skating is hydroplaning.

Bobsleigh runners are different from dogsled runners, which also use water as a lubricant. Dogsleds use flexible runners made of a variety of materials ranging from whalebone to Teflon. These softer materials are very prone to wear, and so are coated with ice to provide a low friction, replenishable surface. This is accomplished by taking a handful of snow, dipping it in water and rubbing it on the runners. After a suitable foundation is formed, a warm mouthful of water is sprayed over the surface and hand-rubbed until smooth and slippery.

However, for bobsleighs, the FIBT states: "It is prohibited to heat the runners or to treat them with solid, liquid or gaseous substances for the purpose of improving their sliding capabilities." This rule was added after East Germany, with their ion-implant-

ed runners increasing the hardness, won gold medals at the previous three Olympiads. Today only one company manufactures the steel for all bobsleigh runners, being between 35 and 37 Rockwell, to ensure hardness uniformity.

The rules further state: "No aerodynamic elements whatsoever may be attached, either outside or under the race suit." A ban that has similarly and prominently been added to the Summer Olympic Games' swimming rules after more than 100 world records were broken last year.

All Olympic athletes take an oath "committing ourselves to a sport without doping and without drugs," so it only seems fitting that their equipment be included. Remember, when the medals are being awarded in Vancouver, you'll know they are going to the best teams and not just the best sleds.



**According to Olympic bobsledding rules, 'It is prohibited to heat the runners or to treat them with solid, liquid or gaseous substances for the purpose of improving their sliding capabilities.'**



*Evan Zabawski, CLS, is a training and consulting specialist for The Fluid Life Corp. in Edmonton, Alberta, Canada. You can reach him at [evan@fluidlife.com](mailto:evan@fluidlife.com).*