

## Avalanche Airbags

By Doug Chabot

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The newest piece of avalanche safety gear to hit the market in the U.S. is the avalanche airbag. These backpacks have a canister of compressed gas that immediately inflates a large balloon when the emergency handle is pulled. They have been around since 1990 in Europe and have gained traction in North America the last few years.

In Bozeman, Mystery Ranch makes their “Blackjack” pack avalanche airbag, which competes with other models on the market. Ben Nobel of Mystery Ranch explains, “A key component to survival of an avalanche is minimizing the time one is buried. Airbags help the victim stay on the surface of the snow, thus dramatically reducing their burial time almost to zero.” That’s a strong incentive to wear one.

Among avalanche fatalities in North America, 75% die from suffocation while 25% die from trauma. For trauma we can wear a helmet and hope we don’t hit a tree, but once the slope fractures and catches us



we have no control. Fortunately, death by suffocation is a slow process. It typically takes longer to suffocate in avalanche debris than it does if you put a plastic bag over your head because there is almost 50% air by volume in avalanche debris. If you are not traumatized you have an 80% chance of survival if you are dug out within ten minutes. That falls to 20% chance at thirty minutes. Ten minutes isn't very long, but it can be enough if you're not too deeply buried and have a skilled partner to dig you out. Survival odds decrease as burial depth increases. Locating someone with a beacon takes time and digging them out takes even more. Airbags can significantly cut down on rescue time because they tend to keep people closer to the surface and sometimes even on the surface, entirely eliminating a search.

The primary purpose of an airbag is to prevent burial. They work, not by floating like a life jacket, but by a process called inverse segregation. Have you ever noticed that in a bowl of mixed nuts or a bag of potato chips the big pieces always end up on top? That’s inverse segregation. An airbag makes us bigger which increases our chances of staying on or near the surface of an avalanche.

Avalanche airbags save lives. Europeans have over 20 years of data showing increased survival rates. A robust study is underway in Canada looking at European and North American data and preliminary findings show that having an airbag increases survival by 14%. That’s a lot. It also seems that around 20% of folks wearing an airbag never deploy it in an avalanche. The majority of these are human deployment failures, not mechanical. Maybe they’re too busy trying to ski or ride out, or maybe the avalanche is too tumultuous to find the handle, or maybe they simply panic. We’re not sure, but about one in five do not deploy the airbag.

There are two downsides to the airbag. The first is that they are expensive. Costs range from \$675 to \$1,200 depending on the model. When I sit in the comfort of my house shopping online the prices are enough to make me think twice. Yet I'm confident that as I'm being swept away in a large slide I would gladly have paid much, much more to not get buried. The second downside is that once the airbag is deployed, the person wearing it is going for the full ride. They will get carried faster and further than someone not wearing one. This works better above treeline with open runout zones in big bowls. It is not pretty if the debris flows through trees or other terrain traps. Be aware of the downsides because if you're wearing an airbag you'll do your best to pull that handle.

My recommendation is to buy one and wear it. Airbags increase chances of survival through reduced burial depth and search times. In an avalanche we need all the help we can get.