

If an air track sled at rest is struck by another moving sled, the total final Kinetic Energy will be largest

1. when the collision is totally inelastic so that the two sleds stick together,
2. when the collision is totally elastic so that the final total KE is the same as the initial total KE.
3. for some partially inelastic collision between the above two extreme cases.
4. None of these: its final velocity is independent of the elasticity because the Total KE is conserved

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The correct answer is #2, because....

- Any degree of inelasticity causes a decrease in ME, due to the generation of heat by non-conservative forces during the collision process.
- Thus, only a totally elastic collision (i.e., one in which only *conservative* forces act) can conserve the ME of the colliding system, and avoid its decreasing due to losses to heat.
- But after the collision (as well as before) the objects' total ME is entirely KE, so that Maximal ME (obtained only in the elastic case), is equivalent to Maximal Total KE.