

Steel rim wheels - the alternative option

It is possible that pneumatic tires might prove impractical, due to wear or durability problems. Steel rim wheels are a good alternative.

Steel wheels on steel rails are not practical

Railway style steel rims are not suitable for high speeds, due to a number of problems.

- Low coefficient of friction, linear motors required for traction
- Rails must be perfect to avoid extreme contact loads due to bumps
- No resilience, the slightest bump causes shock loads
- Harsh and noisy, annoying to passengers and neighbourhoods
- Steel has low strength/weight ratio, not capable of high rotational forces at Hyperloop speeds.

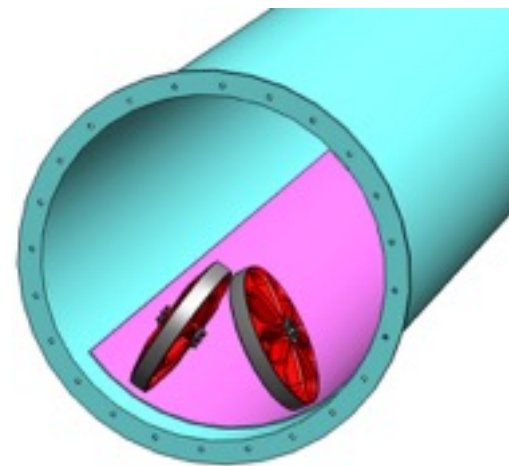


Resilient surface in the tube is needed for metal rim wheels

A rubber or polyurethane liner on the tube wall would give the good grip and soft ride necessary for high speed. Heat would not be a problem, due to the large surface area.

The steel rim would sink into the resilient surface a few mm, increasing the rolling resistance slightly. Bumps of a few mm would be absorbed, and if the wheel bounces on a bigger bump, it would land softly without damage.

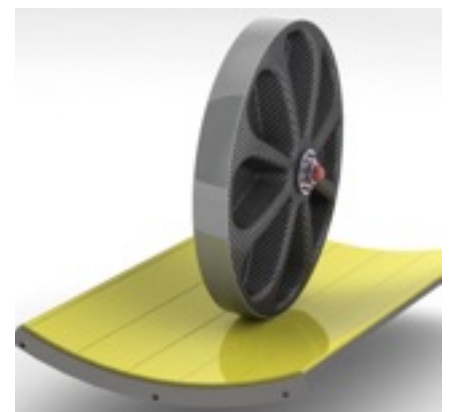
The running surface of the tube would be lined with the resilient material. This would allow a simple 4-wheel suspension layout, with variable banking for curves.



The liner would last for several years before replacement. It could be laid in strips, that can be changed by a machine.

This is a steel tube, with a resilient liner attached. Hard rubber like that used for tires could be used, with good resilience and wear. Polyurethane has better abrasion resistance than rubber, and could be a more economical solution.

The wheels are carbon composite, with a hardened steel rim for wear resistance.



This is the possible construction of a steel-rimmed composite wheel. It has been FEA analysed, and is suitable for the rotational forces at 1,200 kph.

The hardened steel rim is bonded and riveted to the carbon composite wheel in such a way that a single fatigue crack would not cause separation of the whole rim.

