

Current Saxophone Pads

- [Synthetic Saxophone](#) pads (synthetic leather) are sometimes used by beginner players because they are cheaper. A common downside is that they don't produce as good of a seal or sound for the player.
- [Leather](#) is considered the best type of pad to be used, as it can be made with such high quality and are the best at producing a good sound. As any saxophone player can attest to, however, they require high maintenance and are considerably more expensive.
 - To put cost into perspective, a pad replacement on the saxophone can range from [\\$200 to \\$500](#) because of the intricacies associated with disassembling the saxophone as well as the cost associated with making the new pads themselves
- Saxophone pads [usually stick](#) due to the buildup of food and drink while playing. This excess moisture and residue ends up sticking to the tone hole rim. The tone hole is the part of the saxophone that the pad closed down on to play a note.
- Common remedies for sticky pads include not eating before playing, not drinking sugary liquids before playing, staying out of wet conditions, and using common items like a dollar bill to temporarily free the pads movement

The articles above provide good background information for my topic, and allow me to establish a need for my innovation.

Current Addressing of the Need

- Saxophone pads are currently made of leather which is wrapped around a soft cork-like material. This cork can be found everywhere else on the saxophone, so inclusion in the pads is not shocking.
 - Pads are Glued down and restrict the passage of air out of a closed tone hole by making a snug fit with the saxophone itself
- There are barely any companies trying to incorporate polymers or composites consisting of materials such as rubber. There is a clear opportunity gap in the market, as something like this could save saxophone players tons of money and time.

Material Science Solution

- Ethylene propylene diene monomer ([EPDM](#)) is an extremely versatile polymer. Its biggest advantages come from the fact that it is so weatherproof.
 - It has properties to silicon rubber below 250F, which is well in the operating range of saxophones. This also means that it will not melt when heat is applied to remove and add adhesives.
 - Although a concern may be the vulnerability of it towards solvents, most chemicals it will come into contact with on a saxophone are the ones that are found in our spit. That being said, it [performs excellently](#) when faced with alcohols, ammonia, and every acetone. These common household items that are

found in cleaning supplies would have no effect on the effectiveness of the pads, and this would prevent mistakes from ruining thousand dollar instruments

- Use of this material is [not known to cause any adverse health effects](#), despite this material not being at risk for ingestion or being heated to its melting point by any normal person
- Common uses of this material include [car door seals, insulation, and bungee cords](#). Generally, it is used in sealing applications. This plastic is elastic enough to deform and reform itself without shattering when pressure is applied, but also rigid enough to be somewhat firm to the touch. This is exactly what is needed in a saxophone pad.
- EPDM insulates noise, which is excellent as the noise coming out of the saxophone should be only through the open tone holes, and there should be no noise or air escaping from the closed ones. Roofing made from this material can last nearly half a century, so it is safe to assume that something as mundane as a saxophone pad would last at least a century.
- [Cost of EPDM](#)
 - As the material is typically used in construction applications, a look into construction quotes per square foot proved to be useful for determining cost. The average cost per square foot appears to be in the range of \$7.50 to \$12.50. This is more than reasonable for saxophone players who typically won't need to use more than two square feet of the material. This one time fix for poor padding is well in the budget of saxophone players, and would save hundreds of dollars in repairs down the line
- Responses to Typical Environments
 - As mentioned earlier, saxophone padding needs to be well sealed and insulated in order to preserve sound and keep moisture from interfering with pads sticking. Excess moisture buildup on EPDM should be a non-issue because of its water resistance. It will not absorb water like leather does.
 - Moving towards environmentally friendly material usage is extremely important. EPDM is 100% recyclable, and its long-term resistance to the climate makes it a beautiful choice for other uses outside of saxophones.

Conclusion

Leather saxophone pads are a thing of the past, and it is high time to switch to a more modern option. Ethylene propylene diene monomer is an excellent solution to this problem, proving to check all the boxes for the qualities found in saxophone padding. They insulate sound, are recyclable, are weather resistant, water resistant, and chemical resistant. They are elastic and cost effective, and could be molded into the shape of a pad with a cork backbone. Their operating temperatures are very workable, as they will not deform under a heat gun that a repair shop

might operate. Playing effectiveness would need to be tested, but this material seems to be the solution to the padding problem that has long plagued saxophone players over the years.