

Item Number	Function	Hazard	Harm	Severity	Occurrence	RPN	Risk Mitigation	Severity	Occurrence	RPN	AFAP?	Risk/Benefit Analysis
Example	Function being performed.	Description of why the product will not perform conform specs	Description of resulting injury, damage	Extent of damage that can occur to product	Frequency at which the harm can occur	Severity * occurrence	The way by which the risk is reduced/ eliminated	Extent of damage that can occur to	Frequency at which the harm can occur	Severity * occurrence	afap	Yes/No
1	Protect Records	Object falls on record player, causing casing to break	Casing could lose structural integrity, leading to record damage.	3	2	6	The wall thickness of the acrylic will be 1/4" or 1/2", meaning that it will be unlikely to rupture from any ordinary impact. Adding material above the records was also a	3	1	3	afap	Yes
2	Hold Records	Applied grip force is too great.	A moderately high grip force could make the records inaccessible to the user. A high grip force would crack or completely break the records themselves.	2	1	2	Grips will be user-tested so that they are strong enough to hold albums from falling over time and weak enough that the records are easily accessible.	2	1	2	afap	Yes
3	Hold Records	Applied grip force is deficient to hold records in place.	Deficient grip force could lead to records falling out of the casing. This would lead to impact-related record damage under the worst circumstances.	3	2	6	Grips will be user-tested so that they are strong enough to hold albums from falling and weak enough that the records are easily accessible. Records will be standing upright, so they are unlikely to sustain damage even in the event of a total grip failure.	3	1	3	afap	Yes
4	Protect Records	User inadvertently bumps case, causing it to fall and break	Impact-related damage to records would be sustained. The severity of the damage would depend entirely on the force of impact and surroundings.	4	3	12	To make fall-related structural failure a lower-frequency issue, we will implement a wide, stable base into our design.	4	1	4	afap	Yes
5	Holds Records in Place	Crossbeam inserted into casing slips out	Vinyl being held by the crossbeam may fall out and take damage from fall. Severity of damage may depend on how high of the drop and onto what surface	3	1	3	Ensuring the crossbeam fits the hole cut into the casing perfectly. Utilizing a mallet will help embed the crossbeam into the casing for maximum structural integrity.	3	1	3	afap	Yes
6	Hold Records	Crossbeam adhesive fails, decreasing structural integrity of the casing.	Our design will feature a large number of crossbeams, so the failure of one is unlikely to have any impact on the structure of the case. If adhesive failure is a systemic problem, however, resulting from environmental factors or stress, the structure could fail, resulting in record damage.	3	1	3	Crossbeam junction design will be iterated for maximum tensile and shear strength.	3	1	3	afap	Yes
7	Illuminate Album Art	Battery fails	User cannot see album art very well. There is very little risk for damage in this scenario.	1	3	3	We will research batteries that are both long-lasting and reliable in a variety of conditions.	1	1	1	afap	Yes
8	Illuminate Album Art	Lights fail	User cannot see album art very well. There is very little risk for damage in this scenario.	1	3	3	Higher quality, long lasting batteries. This would decrease the frequency in which the battery pack will have to be removed for replacement. Energizer rechargeable or Duracell Quantum batteries would work best.	1	2	2	afap	Yes
9	Illuminate Album Art	Lights shortcircuit	In the worst-case scenario, the vinyl burns and album art will burn, leading to widespread damage to records, album art, and surrounding items. A more likely scenario would be moderate heat that results in little or no damage.	3	1	3	Building the case out of non-flammable materials. Wood will be avoided in the design because of its flammable nature. The only flammable material integrated into the design is the paper album art which is unavoidable.	3	1	2	afap	Yes