Fall Zones and Ground Surfacing:
How do Engineered Wood Fibers and grass measure up?

Fall zones are required around equipment or other activities from which children could fall. The idea is to cushion the falls so the likelihood of children suffering major accidents is lessened.

Fall zones are usually huge. They need to extend 6' out from every part of any equipment, and need to be completely under all the equipment, so the area filled with fall zone material is, as we said, HUGE….

…and therefore, obviously costly, regardless of the material used, so if you're thinking about poured-in-place rubber (PIP), it has a typical lifespan of 10 years **IF** it's installed perfectly over the *perfect* sub-base (which it usually isn't), and it's extremely expensive, so having to replace it every 10 years amounts to a significant yearly maintenance cost. (more later)

Just so you know, fall zones on Natural Playgrounds,are *very* limited in size because many of the "high" elements are built into hills, so there is no place to fall off the sides(!!) which means that fall zones are required on only one side, and that means that fall zones are very much smaller, and therefore less expensive initially *and* over the long run.

One more good reason to consider Natural Playgrounds, right? :))

For fall zones on our natural playgrounds, we typically use Engineered Wood Fiber (EWF). It's a natural wood product, it's an accessible surface meeting ADA standards, and because of the spaces created by the shape of the wood particles, it doesn't compact as quickly as wood chips, which helps EWF last longer.

Despite it's welcome addition to the limited range of fall zone materials, EWF has a few drawbacks. Over time, it does migrate and has to be raked back into place, and it does compact and disintegrate over time, so it has to be replaced on occasion, but those are fairly minor drawbacks compared to PIP.

Poured in Place (PIP) rubber is often suggested (but not by us) as an alternative. We don't ever use it because it's ***extremely*** expensive at between $20 and $30/ square foot, it smells terrible, give off toxic gases, gets very hot when exposed to the sun (150º, hot enough to burn skin), and is as far from natural as can be.

PIP also has an extremely high carbon footprint and its typical lifespan is only 10 years IF it's installed exactly right (which is unusual), but we've heard from several users that they've had to replace theirs every 2-3 years.

Fake grass (turf, replicated grass) has the same drawbacks as PIP, except the surface isn't hot to the touch, but all the other issues are obvious: the high, high cost of installation, bad smell in the heat, cancer issues from ingesting the small balls and breathing in the toxic gases, high carbon footprint, etc etc.

Sometimes we see that PIP surfaces are used for large expanses of playground, even though it's not required as a fall zone in many of the places it appears. Those places might be better suited to a much more natural ground cover, such as grass.

The bottom line, is that more natural fall zone materials such as engineered wood fibers, peastone, or sand are much better for the environment and are less expensive than PIP or fake grass, which has to be replaced every 10 years at **great** expense!

Grass

Grass is not a fall zone material, but there are many instances where it could and should replace PIP or even other fall zone materials. Under constant, day-to-day, heavy use, grass has a hard time surviving, but we continue to use it because despite its limitations, it's a tremendous benefit to the children!

There are many things that can prolong its life. Grass needs nutrients and its roots need aeration. If the soil gets compacted, the roots can't breathe, and the grass will die, so aeration is important — as is feeding, watering, and overseeding. One of the most important but often overlooked recommendations is to let it grow and stay

LONG. It should never be mowed shorter than 3-4" because the leaves/blades can't make enough food to survive.

Oftentimes, though, people get discouraged because they don't have a lawn that looks pristine all the time, so instead of doing the above, and prolonging it's life as long as possible, they tear it out (or don't put it in to begin with) and use PIP instead.

With this in mind, we ran some numbers and came up with some interesting results.

The bottom line, if you irrigate and follow all the recommendations above, you shouldn't need to replace all the grass every year, but even if you did, the cost is almost the same as PIP or artificial turf over the course of it's lifetime. That being the case, we're very much in favor of planting the grass, and then replacing it when necessary. It's FAR better for the kids than any other surface.

PIPs need an asphalt or concrete base which is going to cost anywhere between $7 and $15 per sq ft installed. The PIP itself costs between $22 to $35/ sq ft if installed properly.

Grass and irrigation combined is about 1/10th the cost installed, so essentially, if you replaced the grass entirely every year, it's the same cost. If you install irrigation, aerate and overseed regularly, you shouldn't have to replace anywhere near all of the grass.

So the best solution that's most beneficial for the kids? Replace the grass every year and it should still be LESS expensive than PIP or turf, but worst case it's the same, and it will look so much better, feel so nice, smell great, attract tiny insects that are fun to watch, won't get hot, transpires to create coolness, adds to the naturalness of the landscape, and has an extraordinarily low carbon footprint!

We found this article that gives you another perspective about PIP

The Truth About Poured in Place Rubber Playground Surfacing

Ref: http://www.playground-directory.net/articles/the-truth-about-poured-in-place-rubber-playground-surfacing-27.html

Poured in Place Rubber Surfacing is becoming a very popular choice for playground safety surfacing. Its combination of aesthetic appeal, nearly limitless design potential and unmatched non slip characteristics make it a strong candidate for playground surfacing. But there is much more to poured in place rubber surfacing then meets the eye, given the extremely high cost of this product it is important to take a closer look and get the truth about this product.

What is Poured in Place Rubber?

Poured in place rubber consists of two layers of rubber granules bonded by a urethane binder. The bottom layer, known as the cushion layer is what provides the impact absorption for the surfacing. The cushion layer is made by utilizing shredded rubber buffings (SBR). SBR is a string like shredded rubber made from recycled tires. SBR is combined in proper proportions with the binder and installed anywhere from 1.5"- 4" thick depending on fall heights. The top layer of poured in place rubber is known as the wear course. The wear course is comprised of small granules of rubber, either TPV or EPDM combined with binder and toweled smooth to a thickness between 38" - 1/2".

Poured in Place Rubber - Base Layer

Many installers will tell you that poured in place rubber can be installed on top of crushed stone, typically No. 57 limestone. This is the quick and easy way to install poured in place rubber, it is also the wrong way. When poured in place rubber is installed over crushed stone, it will fail prematurely, be susceptible to areas of standing water and will be lucky to last 12 months without needing to be removed. Poured in place rubber should only be installed on top of a concrete slab that has cured for at least 28 days or on top of cured asphalt. There is no other suitable base layer for the installation of poured in place rubber surfacing.

TPV and EPDM

There are two types of rubber granules that are used in the installation of poured in place rubber, TPV and EPDM. Although these two products look the same, they are not the same. TPV is made from recycled tires, the rubber is then treated with a combination of chemicals, paints and dyes to provide its color. TPV has a much

lower tear strength than EPDM. This means that if you were to try and stretch a granule of TPV, it would break, rather than stretch much sooner than EPDM. EPDM is referred to as virgin rubber. EPDM is not made from recycled rubber, it is in fact manufactured from the start for poured in place installations. EPDM is a much more durable product than TPV, it will reduce wear much better than TPV and ultimately last longer. The downside of EPDM is that certain colors are more susceptible to fading as a result of UV exposures, a problem less common with TPV.

Binders

Binders are what hold the entire poured in place system together, and also hold it firmly in place on the substrate. Not all binders are created equal, and a good binder is the most important consideration for your poured in place rubber surface. There are two types of binders, aromatic and aliphatic. Both are urethane based binders. Aromatic binders are the industry standard. They are more susceptible to UV rays and also leave a yellowish tint on top of the surface, because of this tinting effect, it is recommended that certain colors not be used with an aromatic binder, particularly light colors such as white or beige. Aliphatic binders are also urethane based, the difference is that they are crystal clear and will remain so. Aliphatic binders have a much higher resistance to UV, a higher bond strength and are more stable in varying humidity and heat conditions during installation. On average, aliphatic binders cost three times as much as aromatic binders, however the cost is worth it.

Both binders are moisture cured, this means as they slowly absorb moisture from the air, they dry. Some binders will react violently to moisture, causing a foam known as poly urea. Poly urea formation will ruin a surfacing job. A good binder will be very stable when exposed to water and humidity, it will also have UV stabilizers added to it to ensure longevity. The same will be true with aliphatic binders. If a cheap, or unproven binder is used, the end result will be an ugly surface that will begin to shed and fall apart in a matter of months.

Temperature and Humidity

Because the binders used in poured in place rubber are moisture and heat sensitive, the environmental conditions (temperature and humidity) during installation are critical. In general you should never install poured in place rubber when

temperatures are below 50 degrees or above 90 degrees, with humidity never exceeding 85%. Doing so will force a hyper curing of the product, resulting in a surface full of visible seams and blemishes, with a poor bond strength, because of this the product will fail.

Longevity

Most people believe that poured in place rubber lasts a lifetime. This is just simply not true. If the surface is installed using a premium aliphatic binder, under perfect weather conditions, by an experienced professional and with proper maintenance it will likely last 15 years. The average life of a poured in place rubber surface installed under the same conditions, but using an aromatic binder will be 10 years. Keep in mind that if the area is shaded, it will greatly extend the life of the surface, as will doing a cap coat of binder every 24 months.

Conclusion

The important thing to remember about poured in place rubber is that product quality and experience means everything. You can be the greatest painter in the world, but if the paint does not stick to the wall, the job will be a failure. The same is true with poured in place rubber, you must use time tested products and they must be installed under the right conditions, by experienced installers. Anything less will result in a surface that will fall apart in less than a year.