

## **Restroom Partitions: Steel and Recycled HDPE**

Restroom partitions play a part in the lives of all modern Americans, but has anyone stopped to consider their impact upon the environment? In fact, Yemm & Hart Lt.d. have developed eco-friendly products to keep public restroom visits private. Public restroom privacy has not been a part of history for very long; the toilet partition industry has not been around forever. Ancient Roman public toilets were very public (“Divide...”). At any rate, the materials used for restroom partitions have evolved quickly since their introduction into human society. The classic partition was made of marble and continues to be so today in high-end facilities and historic buildings (“Divide...”). The concern of vandalism led to the widespread use of baked-enamel steel and plastics (“Divide...”). St. Olaf has utilized both stainless steel and plastic partitions in its newer constructions such as Buntrock Commons, Dittman Center, and Tostrud Center. Stainless steel, with or without a paint coating, is the most common partition material throughout the campus. Additionally, marble can be found in the restrooms of Boe Chapel as evidence of the building’s age. Since the 1980s, Formica laminates have competed with solid HDPE plastic partitions and phenolic boards (“Divide...”). Solid-color reinforced composite, made of wood fibers suspended in high-density resins that are so dense as to resist scratching and gouging, have been added to the market more recently (“Divide...”). Beginning in the 1990s, the environmental movement has influenced the restroom partition industry. Concerns about sustainability and indoor-air quality have arisen, and companies such as Yemm & Hart Ltd. and Bradley Corporation have answered the call for more sustainable products.

Bradley Corporation produces several types of partitions, including stainless steel partitions and solid HDPE plastic ones. Bradley Corp. is a member of the Green Building Council and the Wisconsin Green Building Alliance, and both of its products in question have environmentally friendly properties. Stainless steel is a special form of iron, which gives it the technical name of ferrous or ferric alloy, which contains at least 10.5% chromium. The word “stainless” in the name refers to the fact that this steel rusts or corrodes less readily than regular metals. This is one of the main reasons it is a good material for toilet partitions; it does not need frequent replacement - despite the harsh winters and humid summers in Minnesota that may affect some building materials.

There are examples of steel in this form dating back to 400 A.D. (“Environment...”). These examples owe their stainless qualities not to the chromium of modern stainless steel but to high phosphorus content. This mixed with the location (Delhi, India) created a protective barrier of iron oxides and phosphates. Pierre Berthier introduced the rust resistance of an iron-chromium alloy to the world in 1821 (“Environment...”). Unfortunately the early forms of stainless steel were too brittle to be of much use to society (“Environment...”). In 1890 a German scientist, Hans Goldschmidt, developed a process that removed the carbon from the mixture, which was the factor making the steel brittle. By 1911 the recipe was perfected, and in 1913 it was industrialized (“Environment...”). Now stainless steel can be seen in Manhattan on the Chrysler Building, among many others, it can also be found in kitchens as parts of pots and pans and knives, and, most important of all, stainless steel is very useful when creating bathroom stall partitions (“Environment...”).

This product is very environmental, as today’s stainless steel is fully recyclable and according to Wikipedia, “over 50% of new stainless steel is made from remelted scrap metal,

rendering it a somewhat eco-friendly material.” There is a waste product from the production of stainless steel, which is called slag, but the international producers of stainless steel are looking into ways of reusing this slag (“Environment...”). As of right now they separate the slag from its metal components and reuse the metal (“Environment...”). The leftover material is being used as road material, building material, and in agriculture (“Environment...”). The companies are even trying to cut down on power usage. Because “power is expensive...modern stainless mills operate close to the theoretical minimum” (“Environment...”).

Bradley Corp. is a member of the U.S. Green Building Council and the Wisconsin Green Building Alliance (*Bradley*). They also work with LEED to furnish buildings that have the environment in mind by providing both steel and plastic restroom partitions. The company is located in Wisconsin and has a distribution center in Eau Claire, Wisconsin, which is only about one hundred and twenty miles east of St. Olaf, so the shipping distance is at a minimum.

So far, stainless steel seemed to be a great choice for a green building material, but we opted to delve beyond the simpler facts with Bradley Corp. We spoke with the head partition representative, Valerie Bonney, from the Mills Corporation, a subsidiary of Bradley Corporation that deals exclusively with partitions and lockers, and inquired about both the high density polyethylene and the stainless steel partitions. For the sake of continuity, we explored the “700 Series” for both, which means the partitions are floor and ceiling mounted and therefore very sturdy. Both types of partitions are manufactured in Upper Sandusky, Ohio, and distributed through various agents around the country. The closest distributor to St. Olaf is located in Bloomington, Minnesota, and there is also a large distribution center in Wauwatosa, Wisconsin.

The Bradley Corporation is committed to helping buildings achieve LEED standards by including at the least thirty percent post-industrial recycled material in their HDPE partitions

(Bradley). One option even allows for the purchase of Bradley partitions made of one-hundred percent post-industrial recycled material; however, these partitions are only offered in black (Bradley). Bradley Corporation purchases the raw HDPE sheets from Polymer Industries, which is located in Alabama (Bonney). The Alabama factory re-processes their own scraps in order to make the one-hundred percent recycled content plastic sheets for the black partitions (Bonney). The sheets are manufactured into the partitions in Bradley's Ohio factory and the company also sells back the scraps accumulated during the partition production in Ohio (Bonney).

The HDPE partitions come with a warranty of fifteen years. Bradley Corp. will replace the partitions free of charge if something happens to them beyond normal wear and tear (Bradley). Scratches are not visible on the plastic partitions and graffiti is made virtually impossible by the "slippery" surface texture of the polymer (Bradley). The HDPE is durable and attractive. The partitions come in sixteen color options. According to Bonney, the HDPE partitions have a theoretical lifespan of thirty to fifty years if they are properly maintained.

Bonney could not disclose the environmental practices of the factories in which the plastic and the partitions were made. She informed us that they were "typical factories," which can be assumed to equate to factories that are not particularly concerned with environmentally-sound practices. The fact that the plastic is purchased from a company in Alabama is another downside to using Bradley Corporation for the science center building project. This is an unnecessary use of fuel for transportation. It would be ideal if the plastic came from somewhere closer to the manufacturing plant in Ohio. This would reduce emissions and benefit the environment. It would be better if Bradley began using post-consumer recycled content in their partitions. The sole use of post-industrial material is limiting, and in order to achieve the ideal closed cycle for materials, Bradley Corporation and the Alabama "Polymer Industries" would

have to start using post-consumer materials. When queried about the prospect of post-consumer recycling of the HDPE partitions, Bonney said after the sale of the Bradley Corp. partitions, it is up to the buyer to determine what is done with them after their useful life. There are companies that buy used HDPE and recycle it, so if St. Olaf were to buy these HDPE partitions, we would recommend that the school look into selling the partitions to a company that would recycle the materials at the end of their lifespan.

Based on our findings, the HDPE partitions seem to be a better choice over Bradley's stainless steel partitions. According to Bonney, the plastic partitions last longer and are cheaper. The HDPE and the stainless steel partitions are transported by truck, made in the same Ohio factory, and packaged the same way - individually wrapped in plastic. The steel used in the partitions comes from all over the country but is stored in a Pennsylvania warehouse (Bonney). Warehouses are wasteful because a company must pay to oversee, heat and cool, light, power, and own or rent the warehouse. They are a waste of energy and resources. Ideally, a company would have a quick enough turnaround time between manufacturing and shipping that a warehouse would not be needed. Other than the somewhat wasteful practices such as warehousing, trucking long distances, and wrapping each partition in plastic prior to delivery, Bradley is a very good company. The people we spoke with on the phone were very helpful, and Bonney returned our calls promptly and with a good attitude. She was very forthcoming with information and seemed knowledgeable and well-organized. The company is a member of several green building groups, which indicates that they are committed to preserving the environment.

Another supplier of recycled partitions is Yemm & Hart; it is their goal to bring "building materials with recycled content into the main stream. This means developing attractive color

patterns, the highest quality, ease of use and competitive pricing” (*Yemm*). Its Origins line of decorative plastic surfacing material is featured in the partitions that have been explored in this project. On its website, Yemm & Hart lists “Green Materials” immediately below its name and makes no attempt to hide its popular material’s origin, which is post-consumer polyethylene detergent bottles. Eight bottles supposedly produce about one pound of Origins recycled plastic (*Yemm*). The bottles are collected, sorted by color, and shredded into pieces about the size of oats (*Yemm*). They are carefully washed in hot water to remove soap, milk, and paper labels. Because Yemm & Hart sorts the bottles by color, it can offer different color combinations and patterns which penetrate the entire product instead of residing upon just the surface (*Yemm*). During production, formulated blends of flakes are then spread into a mold, positioned in an oven, and heated until the plastic becomes molten. Pressure is applied to the mixture, which makes possible the random color patterns that Origins offers. At this point, the flakes are permanently bonded together. An ultraviolet protective coating is added to the surface to stabilize the material when in contact with direct sunlight (*Yemm*). In the future, the company plans to add the UV stabilizers into the material rather than applying it as a coating (*Yemm*). Yemm & Hart claims to make recycled materials vivacious through its special use of color. It does so in a way that seems to bring the eco-effective movement forward in accordance with the principles of William McDounough and Michael Braungart as manifested in *Cradle to Cradle*.

Although what we know about Yemm & Hart is very impressive, we were not able to take it at face value. A few contacts made led to some more valuable information about Yemm & Hart toilet partitions. In an email correspondence, Maggie McInnis of Quinn Evans Architects shared that Yemm & Hart is “good to work with.” Quinn Evans used the partitions in the S.T. Dana building at the University of Michigan. She claimed that there were “no problems with the

installation or delivery of the material.” She said they have held up well and the occupants are pleased with the installation at the building. Quinn Evans also used the same material for the construction of the lavatory countertops. McInnis cautioned against the use of a multi-color palette for the partitions. She said that the pattern is “interesting, although not consistent. Some areas are blurred, which building occupants have complained about making them dizzy.” According to McInnis, a single color scheme would be the best choice.

After detailing its production techniques, the highly-informative Yemm & Hart webpage states “All inquiries are welcome.” In fact, when we inquired, Yemm & Hart was quick to answer. Stephen W. Yemm returned a completed Environmental Impact Questionnaire to us, and it provided the type of responses we were hoping for from a company that claims to be environmentally-friendly.

We were pleased to learn that Yemm & Hart does not warehouse its product. It is manufactured by JIT Manufacturing. The raw materials are acquired in the Eastern United States, meaning, they are regionally sourced. Yemm & Hart claims that its product can be reused directly as work surfaces or shelving. It can also be recycled back into 100% post-consumer polyethylene. At this time, the scrap plastic market uses recycled Origins materials in this way. Yemm estimates that the practical number of times the item can be recycled is eleven. Origins is completely non-toxic, does not off-gas, and produces only about two percent waste per unit of finished product. The factory runs on gas and electricity, but waste water is reclaimed by the manufacturer and a steam boiler is used so that the steam and water can be re-circulated. No carcinogens, CFC’s, or HCFC’s are involved in the production of Origins partitions. Origins partitions are transported by truck, and standard carpentry tools are used during installation (Yemm). As a waste material, Origins has a benign impact on the environment. It is packaged in

chipboard, wood pallet, and steel bands. These are accepted by the manufacturer for reuse. The useful life expectancy for Origins partitions is twenty five years, and they are under warranty for fifteen of those years. Origins partitions are maintained through cleaning with a solution of warm water and a non-abrasive mild cleaner or solvent depending on the type of stains. Scratches are easy to repair by rubbing the back of a spoon on top of the scratch to smooth it out (*Yemm*).

Its manufacturing practices may not be one hundred percent sustainable, but surely within the limited market of restroom partitions, Origins partitions by Yemm & Hart are an excellent choice for a sustainable product. Yemm & Hart appears to be the only company of its kind as one that makes a product that is impressive by its own virtue and enhanced because it is sustainable. One can take pride in choosing Origins partitions not only because they are environmentally-sustainable but also because they are a stand-out product in aesthetic terms. Unless one is incredibly partial to black, the same offer is not made by Bradley Corp. A downside to Origins partitions is that the closest Yemm & Hart factory is about 630 miles away.

Overall, we were pleased with what our research unearthed because the restroom partition industry as a whole has adapted to the green building trend. All three of the options we explored in depth would be appropriate for the new science center; the companies we looked at all seem to pay some attention to Mother Nature. Yemm & Hart was the quickest to respond to our questions about its practices that influence the environment, and it answered the most completely. Additionally, its answers were the kind we were looking for. Although Yemm & Hart partitions would be shipped further to reach the new science center, the energy expounded in traveling this distance is surely less than that used to transport Bradley's materials across the country during production combined with that used to support the warehouses in general. If what

we hope for comes to pass, one hundred percent post-consumer HDPE will be in almost all new construction everywhere.

### Works Cited

Bonney, Valerie. Personal interview. 27 Jan. 2006.

*Bradley Corp Homepage*. 2005. *Bradley Corporation*. 22 Jan. 2006

<<http://www.bradleycorp.com>>.

“Divide And Conquer.” *Architecture*. May 2004, Vol. 93, Issue 5: 85. *Academic Search Premier*.

EBSCO Publishers . Rolvaag Memorial Lib., MN. 22 Jan. 2006

<<http://www.epnet.com/>>.

“Environment, Health, and Safety.” 2004. *Australian Stainless Steel Development Association*.

24 Jan 2006 <<http://www.assda.asn.au/asp/index.asp>>.

“Environmental Impact Questionnaire.” 2006. *St. Olaf College*. 22 Jan. 2006.

<<http://www.stolaf.edu>>.

McInnis, Maggie. “RE: Yemm & Hart restroom partitions.” E-mail to Laura Oliver. 26 Jan.

2006.

“Stainless Steel.” 2006. *Wikipedia*. 25 Jan. 2006. <<http://www.wikipedia.org/>>.

*Yemm & Hart Green Partitions Home Page*. 2005. *Yemm & Hart Ltd*. 22 Jan. 2006

<<http://www.yemmhart.com/>>.

Yemm, Stephen W. “RE: Environmental Impact Questionnaire.” E-mail to Laura Oliver. 26 Jan.

2006.