

Title: LEED-ing the way to market transformation: Portland State University and Miller Paint

Abstract

Portland State University (PSU) is committed to sustainability. Our Design Standards require all major new construction and renovation projects to achieve Gold certification under LEED v4. These standards commit PSU to using sustainable products that are manufactured and sourced locally, and are verified as sustainable through industry guidelines or third party organizations. Following PSU’s Sustainable Procurement Policy, materials with low “embodied emissions” are preferred. PSU seeks Health Product Declarations (HDPs) for materials that outline life cycle impacts and sustainable attributes. Though standards and policies guide our sustainability efforts, PSU’s new Strategic Plan requires the university to *“develop a strategy for leveraging our purchasing, employment, and investment priorities to advance equity, sustainability and community wealth-building.”* This case tells the story of one instance of this strategy: our partnership with Miller Paint. In response to PSU requests for healthier paints and product transparency, Miller took the initiative to turn challenge into opportunity. They inventoried ingredients, screened paints against the Red List and provided HPDs to meet LEED v4 standards. By publicly disclosing their paint formulas, Miller satisfied PSU’s needs while positioning itself to compete in the expanding market for non-toxic materials and product transparency.

Summary

Goals	Strategies	Results
“Walk the talk” of PSU’s Technical Design Standards, Sustainable Procurement and Life Cycle Consideration policy, and broader sustainability goals.	Follow the criteria outlined in campus policies and standards to make procurement decisions.	Provided evidence to the campus and local community of PSU’s commitment to sustainable purchasing practices.
Reduce PSU’s use of worst in case materials and chemicals with the greatest impact to human and ecosystem health.	Commitment to the procurement and use of non-toxic paints in our capital design and maintenance standards.	Produced a healthier work environment for our faculty, staff, students, and community partners through the use of low VOC paints.
Incent preferred supplier to improve the environmental, social, and economic performance of their paints through greater product transparency.	Combined advocacy from PSU’s partners: Fortis Construction Inc, Woofter Architecture, Sink Combs Dethlefs Architecture Design and Brightworks Sustainability motivating Miller paint to inventory and report their paint formula as a	Miller Paint Company formula inventory has led to the removal of Red Listed chemicals where possible in their paints and the production of HPDs for two of their paint lines.

	precondition of support for their product.	
Advocate for healthier products and encourage preferred suppliers to expand their share of the rapidly expanding market for products with HDPs.	Certification of Miller Paint lines as ultra-low VOC, with reduced use of Red Listed chemicals and HDPs, positions them to expand their market share.	The market for low VOC paints was 6.7 Billion in 2017 and is projected to grow 6.45% per annum. ¹ Expansion into this market presents a business opportunity for Miller Paint and an economic development opportunity for the Portland region.
Become more competitive in LEED certification efforts through use of paint products that adhere to the highest standards of sustainability by eschewing the use of toxic Red Listed chemicals and providing HDPs.	State requirements for new construction, as well as PSU’s own sustainability standards and policies require the University to seek the highest LEED certifications possible for all their capital projects. The use of ultra-low VOC paints without Red Listed chemicals helps in this effort.	PSU’s LEED Scorecard (appended under References and Additional Resources) shows extra credit points for Material Ingredient Disclosures and use of Miller’s low VOC paints.

Goals

Miller Paint has long been one of PSU’s preferred providers. Besides producing a superior product, they have done so in our community since 1890. They are also an employee owned company that shares PSU’s commitment to sustainability. For example, in 2010, Miller received an Innovation in Sustainability award from Sustainable Business Oregon and since 2009 they have been the largest retailer of MetroPaint. MetroPaint is Oregon’s signature paint recycling program. More than 100 hazardous waste collection stations around the state send paint to MetroPaint for re-processing into commercial grade paint that Miller sells in its stores.



¹ <https://www.mordorintelligence.com/industry-reports/low-voc-paint-market>

Valuing community and sustainability as both partners do, it made perfect sense for PSU to engage Miller when it came time to purchase paint for our Stott Center Upgrade project. Miller was receptive to making the necessary adjustments to meet our goals:

- Procurement of sustainable products in adherence to our policies and standards;
- Elimination of worst in case materials and chemicals with the greatest impact to human and ecosystem health in the paints they provided;
- Greater product formula transparency;
- Economic development through increased share of the healthy products market; and,
- Greater competitiveness for PSU's LEED certification efforts.

Strategies and Actions

With the decision to expand an existing athletic facility (the Peter Stott Center) to include public event programming and additional academic space, PSU formed a development team to execute the project. The team consisted of PSU's Capital Planning department, Fortis Construction Inc, Woofter Architecture, Sink Combs Dethlefs Architecture Design and Brightworks Sustainability. Sub-contractors were brought in as needed, with a local company – Miller Paint – supplying the necessary finishes.

Oregon law requires publicly funded buildings to attain LEED certification. At PSU, LEED Gold is the baseline for all of our new and refurbished buildings. To earn



LEED Gold we utilize Innovation Credits we receive for materials use. These credits take into consideration the life cycle of the material.

In order to obtain maximum LEED credits, materials free of Red Listed chemicals are preferred. However, when we began the Stott Center Upgrade project, PSU's paint provider - Miller Paint - was unaware of the LEED v4 standards that called for Red List free paint formulas, and did not have a product line that met this qualification. Regardless, because PSU and Miller Paint have a

long shared history based on mutual values, once Miller learned of PSU's desire to adhere to LEED v4 standards, they agreed to work with the university to meet its needs.

The principle challenge for Miller and PSU was obtaining LEED v4 credits for new materials through a process called Building Product Disclosure and Optimization – for Material Ingredients. To meet these credit requirements, the PSU/Miller team selected over 20 building products that had been assessed for their chemical inventory and reported this information publicly in the form of a Health Product Declaration (HPD). A HPD includes full disclosure of known hazards in compliance with HPD Open Standards, that call for chemicals to be disclosed down to the scale of at least 1000 ppm. Miller paint had not previously gone through the process of inventorying the chemicals in their paint and completing an HPD. Because PSU was pursuing LEED credits that look for products that have disclosed their material ingredients, and many other competing paint manufacturers already have this disclosure, there was an opportunity for PSU to mentor Miller paint as they moved through the process. The process resulted in Miller developing two paint lines with HPDs.

Through greater formula transparency and HPDs, Miller now has certified product lines that are less toxic and avoid the use of Red Listed chemicals. This is a major step towards increasing their share of the rapidly expanding market for healthy and more sustainable paints. Additionally, this effort makes Miller products more desirable for organizations that are building to LEED v4 standards. The success of this effort will be measured by the increased sales of Miller's healthier paint products, and the number of projects in which their HPD paints are used.

Financial Information

With a Board of Trustees approved budget of \$51.1 million, the Stott Center Upgrade is a mid-sized construction project for PSU. The specification, purchase, and installation of building materials accounted for \$18 million, with PSU's share of the paint costs coming in at just over \$100,000. Sub-contractors spent additional amounts on Miller Paint, but because these were aggregated in their contracts, the amounts are difficult to parse. The decision to use Miller's line of HDP paints was made by PSU's Office of Capital Projects and Construction, based on our Technical Design Standards.² Because they meet PSU's standards, are local, and are willing to adapt their products to meet our needs, Miller Paint is our preferred provider. Now that their line of low-VOC paints have HPDs associated with them, they can help organizations that choose their products maximum LEED v4 credits for innovation and material transparency.

² *PSU's Technical Design Standards*

The net value of working on this project with Miller was less financial, than it was mission fulfilment and economic development in our community. Now that Miller has committed to making their paint formulas more transparent, and eliminating as many Red Listed chemicals as possible from those formulas, they have positioned themselves to compete for a larger share of the burgeoning market for ultra-low VOC paints with HDPs.

Results

Through its partnership with Miller Paint, PSU is able to provide evidence to our campus (and local) community that we “walk our talk” when it comes to sustainability. By closely adhering to our policies, standards and planning efforts, we are able to provide our faculty, staff, students and community partners with the healthiest possible learning and work environment. This would not be possible, but for the influence PSU is able to exert through its significant purchasing power. In this case study, we have demonstrated how this power was used to help move the Miller Paint Company towards a new era of product transparency that will make them more competitive in a rapidly growing market for healthier paints. Expansion into this market is a real opportunity for Miller Paint as well as an economic development opportunity for the Portland region. Because Miller was willing and able to make the necessary adjustments to their products, PSU was able to achieve its objectives and earn extra LEED v4 credit points for Material Ingredient Disclosures. Consequently, the Stott Center Upgrade project is on track for LEED v4 Gold. Now that Miller is participating in the HPD disclosure program, they have opened new avenues for future LEED v4 work.

Benefits

Some long term benefits to PSU are:

- Proven reputation for sustainable procurement practices
- Improved supply chain by sourcing paint products that meet new higher LEED standards
- Mentored local business through the Health Declaration Product process, making them more competitive in an expanding market

Benefits to Miller Paint include:

- Strengthened position as preferred provider in PSU’s supply chain
- New products that makes Miller more competitive in the expanding market for healthier paints
- Greater transparency in their product lines and participation in the HDP program

Lessons Learned

- The paint business is hyper-competitive and producers are justifiably reluctant to share chemical formulas they perceive as trade secrets. However, universities with significant purchasing power can make a market-based case for sharing proprietary information, if they can make the benefits of doing so clear to the producer.
- Local businesses can benefit from their relationships with larger anchor institutions, when those institutions are willing to mentor them to improve their product.

References and Additional Resources

- [Sustainable Procurement & Life Cycle Consideration Policy](#)
- [Portland State Technical Design Standards – Section C: Sustainable Design](#)
- See attached LEED Scorecard for the Stott Center Upgrade project
- See attached letter confirming PSU’s interest in having their project team (Fortis Construction Inc, Woofter Architecture, Sink Combs Dethlefs Architecture Design and Brightworks Sustainability) work with Miller Paint on the Stott Center Upgrade project.

The letter explains how this team is responsible for the specification, purchase, and installation of approximately \$18 million dollars in building materials for the project; that human and environmental health considerations are central to all of their purchasing decisions and recommendations; and that supporting manufacturers aligned with this philosophy is a top priority.

41 Points Earned in LEED Design-Phase Review

24 LEED Construction-Phase Points tracking as "Yes"

65

PSU Peter Stott Center Renovation & Viking Pavilion
LEED Scorecard NCV3

09.18.17



LEED Gold requires all prerequisites and 60 pts minimum

Total Project Score

Yes	?Y	?N	No		
65	2	8	35	Total Project Score	
Y	?Y	?N	N		
22	0	0	4	Sustainable Sites	26 Points Possible
KPFF-Fortis	Y			C Prereq 1	Construction Activity Pollution Prevention n/a
BW	1			i Credit 1	Site Selection 1
BW	5			i Credit 2	Development Density & Community Connectivity 5
PSU-Fortis	1			C Credit 3	Brownfield Redevelopment Regional Priority 1
BW	6			i Credit 4.1	Alternative Transportation, Public Transportation Access 6
BW	1			i Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms 1
BW	3			i Credit 4.3	Alternative Transportation, Low Emitting & Fuel Efficient Vehicles 3
BW	2			i Credit 4.4	Alternative Transportation, Parking Capacity 2
			1	C Credit 5.1	Site, Habitat -- Regional Priority 1
BW-PSU	1			i Credit 5.2	Site, Open Space 1
KPFF			1	i Credit 6.1	Stormwater Design, Quantity Control 1
KPFF			1	i Credit 6.2	Stormwater Design, Quality Control 1
KPFF	1			C Credit 7.1	Heat Island Effect, Non-Roof 1
WA	1			i Credit 7.2	Heat Island Effect, Roof 1
LUMA			1	i Credit 8	Light Pollution Reduction 1
6	0	0	4	Water Efficiency	10 Points Possible
PAE	Y			i Prereq 1	Water Use Reduction, 20% Reduction n/a
LHLA	2		2	i Credit 1	Water Efficient Landscaping, Reduce by 50% , No Potable Use 2-4
			2	i Credit 2	Innovative Wastewater 50% of flush supply non-potable, Regional 2
PAE	4			i Credit 3	Water Use Reduction, earned 46.4% 2-4
15	0	7	13	Energy & Atmosphere	35 Points Possible
WBS	Y			C Prereq 1	Fundamental Commissioning of the Building Energy Systems n/a
GLU	Y			i Prereq 2	Minimum Energy Performance n/a
PAE	Y			i Prereq 3	Fundamental Refrigerant Management n/a
GLU-PAE	8		11	i Credit 1	Optimize Energy: 48% new / 52% existing, awarded 25% 1-19
GLU			7	i Credit 2	On-Site Renewable Energy, 1% to 13% 1-7
WBS	2			C Credit 3	Enhanced Commissioning 2
PAE	2			i Credit 4	Enhanced Refrigerant Management 2
BW	1		2	C Credit 5	Measurement & Verification 3
BW-PSU	2			C Credit 6	Green Power 35%, Cost estimate = approx. \$2,500 2
6	0	0	0	Innovation & Design Process	6 Points Possible
BW	1			i Credit 1.1	Exemplary Performance: Access to Transit, SSc4.1 1
BW-PSU	1			C Credit 1.2	Innovation: Salmon-Safe certification - PSU campus cert. 1
BW-PSU	1			C Credit 1.3	Innovation: Green Cleaning Program 1
BW	1			i Credit 1.4	Exemplary Perf: Water Use Reduction 45%, earned 46.4% 1
BW-Fortis	1			C Credit 1.5	Innovation: Material Ingredient Disclosure v4 1
BW	1			C Credit 2	LEED™ Accredited Professional 1
8	0	1	6	Indoor Environmental Quality	15 Points Possible
PAE	Y			i Prereq 1	Minimum IAQ Performance n/a
BW-PSU	Y			i Prereq 2	Environmental Tobacco Smoke (ETS) Control n/a
PAE	1			i Credit 1	Outdoor Air Delivery Monitoring 1
PAE	1			i Credit 2	Increased Ventilation 1
Fortis	1			C Credit 3.1	Construction IAQ Management Plan, During Construction 1
Fortis			1	C Credit 3.2	Construction IAQ Management Plan, Before Occ. - IAQ Testing 1
Fortis	1			C Credit 4.1	Low-Emitting Materials, Adhesives & Sealants 1
Fortis	1			C Credit 4.2	Low-Emitting Materials, Paints & Coatings 1
Fortis	1			C Credit 4.3	Low-Emitting Materials, Flooring Systems 1
Fortis	1			C Credit 4.4	Low-Emitting Materials, Composite Wood & Agrifiber Products 1
WA-PAE	1			C Credit 5	Indoor Chemical & Pollutant Source Control 1
LUMA-PSU			1	i Credit 6.1	Controllability of Lighting 1
			1	i Credit 6.2	Controllability of Thermal Comfort 1
PAE			1	i Credit 7.1	Thermal Comfort, Design 1
PAE-PSU			1	i Credit 7.2	Thermal Comfort, Verification 1
			1	i Credit 8.1	Daylight & Views, Daylight 75% of Regularly-Occupied Spaces 1
			1	i Credit 8.2	Daylight & Views, Views for 90% of Regularly-Occupied Spaces 1
2	0	0	2	Regional Credits	4 Points Possible
97201				← Project Zip Code	
PSU-Fortis	1			C Credit 1.1	SSc3: Brownfield Redevelopment 1
			1	i Credit 1.2	SSc5.1: Restore Habitat 1
			1	i Credit 1.3	Wec2: Innovative Wastewater - 50% of flush supply non-potable 1
			1	C Credit 1.4	Mrc1: Building Reuse, 95% 1
			1	C Credit 1.5	Mrc3: Material Reuse, 5% 1
WA-Fortis	1			C Credit 1.6	Mrc7: Certified Wood, 50% of new wood budget FSC-wood 1



**SINK
COMBS
DETHLEFS**
ARCHITECTURE DESIGN

woofter architecture

BRIGHTWORKS
SUSTAINABILITY

 **FORTIS**
CONSTRUCTION INC.

Steve Dearborn
CEO & President
Miller Paint Company
12812 NE Whitaker Way
Portland, Oregon 97230

Dear Mr. Dearborn:

Portland State University, Fortis Construction Inc, Woofter Architecture, Sink Combs Dethlefs Architecture Design and Brightworks Sustainability are collaboratively working on the Portland State University Peter Stott Center, an exciting project pursuing use of healthy building materials as defined by the Living Building Challenge's Materials Red List. To learn more about the Red List, please refer to attached pages and visit: <http://living-future.org/lbc>.

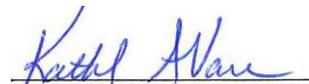
Our goal is to eliminate the use of worst-in-case materials and chemical with the greatest impact to human and ecosystem health. This goal requires that all material and product choices are screened against the Red List to exclude a suite of substances that pose immediate and long-term threats to human and environmental health.

Through our team's research, we have not been able to confirm that Miller Paint products (and Premium Interior Satin, specifically) meet the Red List Free requirements because Miller has not made available a comprehensive inventory of ingredients. We are writing this letter to encourage your firm to make this information publicly available.

Collectively, PSU, Fortis, Woofter, Sink Combs and Brightworks are responsible for the specification, purchase, and installation of approximately \$18 million dollars in building materials for this project. Human and environmental health considerations are central to all of our purchasing decisions and recommendations, and supporting manufacturers that align with our philosophy is a top priority.

Thank you for your time and attention to this matter; we look forward to a day when we can unreservedly specify your product and recommend its use to others.

Sincerely,



Kate Vance
Sr. Project Manager
Capital Projects & Construction
Portland State University

PORTLAND STATE UNIVERSITY CAMPUS MATERIALS AND CHEMICAL SUMMARY STATEMENTS:

The Living Building Challenge Standard requires that projects screen all material and product choices to exclude a suite of substances that pose immediate and long-term threats to human and environmental health. This “Red List” is updated and expanded in response to the latest environmental health science.

Cadmium

The US Department of Health and Human Services and the International Agency for Research on Cancer have determined that cadmium is a known human carcinogen, associated with lung cancer. Additionally, acute and long-term exposures can lead to lung and kidney damage, bone loss, hypertension. In sufficient quantities, cadmium is lethal. Cadmium’s extreme toxicity means that overexposure can occur even when only trace amounts are present which can occur during smelting and electroplating activities.

Chlorinated Polyethylene and Chlorosulfonated Polyethylene

Chlorinated Polyethylene (CPE) and Chlorosulfonated Polyethylene (CSPE) are Persistent Organic Pollutant Source Materials: due to their carbon-chlorine bases, these products contribute to the creation of dioxins and furans at different points in their life cycle (often manufacturing and/or disposal). According to the World Health Organization, dioxins are some of the most potent toxins known to humans, with no known safe limit for exposure and a strong propensity for bioaccumulation. In addition, dioxins are highly persistent in the environment. Similarly, furans accumulate in animal fat, concentrating as they travel up the food chain. Non-chlorinated polyethylene products are readily available in many product categories.

Chlorofluorocarbons (CFCs)

According to USEPA, the depletion of the Earth’s protective ozone layer by chlorofluorocarbons (or CFCs) is responsible for an increased incidence of skin cancer, cataracts, impairment of human immune systems, and damage to wildlife. CFCs have been banned from production in the United States since 1995.

Chloroprene (Neoprene)

Chloroprene is a Persistent Organic Pollutant Source Material. Due to its carbon-chlorine base, it contributes to the creation of dioxins at different points in its life cycle (often manufacturing and/or disposal). According to the World Health Organization, dioxins are some of the most potent toxins known to humans, with no known safe limit for exposure and a strong propensity for bioaccumulation. In addition, dioxins are highly persistent in the environment.

Formaldehyde (added)

Formaldehyde is classified by the International Agency for Research on Cancer and the State of California as a known human carcinogen. Common health effects at low levels of exposure to this volatile organic compound include irritation and sensitization as well as acting as an asthma trigger, and long-term exposure is associated with nasal cancers and leukemia.

Halogenated Flame Retardants

Halogenated Fire Retardants (HFRs) are a broad class of flame retardants containing chlorine or bromine that have aroused concern due to their exponential accumulation in human beings in recent years. HFRs are persistent bioaccumulative toxins, meaning that they accumulate in organisms and the broader environment, often reaching alarmingly high concentrations as they travel up the food chain. In addition, certain halogenated products have shown evidence of harm to humans and other animal species. According to the Washington State Department of Ecology, for example, the toxicity endpoints of concern for Penta-PBDE include adverse effects on neurological development, reproduction, thyroid hormone disruption and possible liver toxicity.

Hydrochlorofluorocarbons (HCFCs)

Hydrochlorofluorocarbons (HCFCs) are potent ozone depleting compounds. While less destructive than the now-banned chlorofluorocarbons, HCFCs are targeted for gradual phase-out by the US EPA with a total ban going into effect in the year 2030. According to USEPA, the depletion of the Earth's protective ozone layer is responsible for an increased incidence of skin cancer, cataracts, impairment of human immune systems, and damage to wildlife.

Lead

According to the Agency for Toxic Substances and Disease Registry, the environmental levels of lead have increased over 1000 fold over the last three centuries, due almost exclusively to human activities. Lead exposure is damaging to virtually every organ and system in the human body, but is particularly damaging to the brain and central nervous system—profoundly so for young children and developing fetuses. Lead exposure is correlated with decreased IQ and delayed learning in children; scientific research has identified no safe level of lead exposure, and effects are irreversible.

Mercury

According to the World Health Organization, mercury produces a suite of ill effects, including harm to the nervous, digestive and immune systems, and even death. WHO lists children and developing fetuses as especially vulnerable to damage from mercury. Mercury biointensifies in the environment, accumulating in predator species such as tuna and human beings, eventually reaching concentrations thousands of times more intense than ambient levels.

Petrochemical Fertilizers and Pesticides

According to the US EPA, the human health effects of pesticide exposure vary with the pesticide, from acute irritation and destruction of skin tissue, to damage to the nervous system, cancer, and death. Petrochemical fertilizers and pesticides represent a vast family of products with an equally vast range of negative human health, animal and ecosystem effects, from the nitrogen loading of our water bodies resulting in hypoxic aquatic conditions, to the specific toxicological effects of various pesticides, which range depending on the class of chemicals, from arsenical pesticides (liver, kidney, brain, bone marrow and nervous system toxicity) to halocarbons (heart muscle, lung, brain, liver and kidney damage).

Phthalates

Mounting evidence from animal studies show the hormone disrupting potential of phthalates, prompting the National Research Council to urge the US Environmental Protection Agency to pursue a "cumulative risk assessment" of this class of chemicals to determine their interactivity. Testing by the Centers for Disease Control and Prevention shows that phthalates are nearly ubiquitous in the US population, with highest concentrations in women and in children aged 6 to 11 years. The endocrine disrupting nature of phthalates has implications for childhood and reproductive development, as well as cancer incidence. The European Union and over a dozen countries have banned the use of phthalates in children's products, as has the State of California.

Polyvinyl Chloride (PVC)

PVC's vinyl chloride monomer building block is a known human carcinogen, according to the US Department of Health and Human Services. In addition, PVC is a Persistent Organic Pollutant Source Material. Due to its chlorine content, PVC manufacture often contains other substances of concern, such as cadmium, lead, and phthalates, and can result in the production of dioxins during production and disposal phases.

Wood treatments containing Creosote, Arsenic or Pentachlorophenol

According to the US Department of Health and Human Services, creosote exposure is associated with skin and scrotum cancer in humans, and liver, kidney, and gestational problems in laboratory animals. According to the US Department of Health and Human Services, inorganic arsenic is not only an acute toxin; it is a known human carcinogen. According to the US Department of Health and Human Services, pentachlorophenol is linked to liver and immune system damage in humans, and reproductive and thyroid damage in laboratory animals.