

Carpet Adhesive Analysis

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Carpet Adhesives

Carpet adhesives are a fairly new development. Their first major use was about 40 years ago in the Ford Rotunda of Dearborn Michigan. Now, almost all carpets are installed using some type of adhesive.

Carpet adhesives are made with five main ingredients. They are: the vehicle, fillers, binders, viscosity controls and preservatives. The vehicle for today's adhesives is, for the greater part, water. It is less toxic than other alternatives, less flammable, and it still gets the job done. In the past, different types of solvents were used instead of water and the products were far more volatile. The other ingredients are generally quite varied from product to product and give each of them their distinctive characteristics (Knudtson 1-2). Sometimes volatile solvents are still used to liquefy the bonding agent. Even so, more and more companies are reducing the amounts of volatile substances in their products (Graham 1).

There are two main types of carpet adhesives. There are adhesive backed carpets and spreadable adhesives. This project focused on the spreadable kind, as they are more versatile. They can be used with any kind of carpeting, and are just as effective as carpets backed with adhesive. When using a spreadable adhesive, the first step is to know what carpet you are using. You must match the adhesive with the type of backing on the carpet to get a proper attachment. Since we don't know the kind of carpeting St. Olaf will decide on, we had to examine brands that could be used in many situations. Next you must know the type of substrate that the adhesive will be put on. We assumed St. Olaf would have a concrete floor. After purchasing a proper adhesive, you thoroughly clean off the substrate. Then you spread the adhesive on the concrete using a specified trowel. Following this, you lay out the carpet and press it down using a heavy roller. This should all be done in a well-ventilated area with gloves and eye protection. You will

probably need to do a pH test on the concrete before application. This will tell you if there is moisture in the concrete. The area being adhered normally has to be completely dry for 24 hours afterwards for the adhesive to properly dry. If moisture comes in during this time, it would greatly decrease the lifetime of the adhesive (W.W. Henry Company).

The standard health and environmental hazards associated with carpet adhesives mainly deal with the off gassing of the material over its lifetime and during drying. We searched for other types of concerns like manufacturing waste, energy used to create and ship the product, whether the raw materials used were harvested safely, and other data asked for on the Environmental Impact Questionnaire supplied by the Minnesota Sustainable Design Guide, but found very little information. Companies do not readily give out their information to students who have no authority, and the help-line assistants that are there do not know that much about their companies. The carpet adhesive industry has taken steps towards becoming green. Most of the products we found were Carpet and Rug Institute Green Label Certified. This has become a sort of industry standard. The only requirements are that the product off gasses less than 10 milligrams of volatile organic compound per square meter per hour, .05 milligrams of formaldehyde per meter squared per hour, and 3 milligrams of 2-Ethyl-1-Hexanol per meter squared per hour. These standards are not extremely stringent, but they are a step in the right direction (CRI).



**Figure 1 CRI
Green
Certification Seal**

Why would anyone want to know about carpet adhesives? At first our group wanted to do carpet backings, a sub-section of carpeting. We wanted to do that because we felt that the backing was the most hazardous part of the carpet and wanted to learn more. When another group wanted

to do carpeting, Professor Jackson asked us if we would switch to carpet adhesives. Being the wonderful, kind and polite boys that we are, we decided to accept this new challenge. Carpet adhesives probably had even worse chemicals in them, which made them even more interesting. The rest of this report will be informing the reader about four different carpet adhesives: Henry's Greenline GL62, 3M's Blue Glue NF Carpet Adhesive, Chapco's SS475, and Para-Chem's Powerhold 4000. It will also compare and contrast the different products, giving a recommendation of what our group thought would be the most economically and environmentally sound product.

Henry's Greenline products are pushing the edge of the industry to become greener. They have come up with 13 new products in the last 12 months that all hold to a higher standard than the CRI green label. One of these products is Henry GL62, a high-performance, commercial carpet adhesive. It can be used with polypropylene, latex unitary, urethane foam, unitary, urethane laminate, jute, hot melt, woven, latex foam-backed and non-backed needle-punched carpets. For the layman, that means it is fairly versatile. It also bonds well with concrete. The installation area and adhesive must be at about 65 degrees Fahrenheit two days before and stay that temperature until two days after application. Clean the floor thoroughly before applying the adhesive. If the carpet is a rough backed carpet, use a V-Notch 1/8D x 1/8W x 1/16 inch A trowel. In this case, one gallon of GL62 will cover 10-12 square yards. If the carpet is smooth backed, which we assumed for the



Figure 2 Henry Greenline GL62

purposes of our poster, a V-Notch 3/32D x 3/32W x 3/32A trowel should be used and each gallon will cover 16-18 square yards. Spread the adhesive and lay the carpet immediately on the wet substance. Position and cut the carpet within 60 minutes of placing it. Next roll the floor with a 75 to 100 pound roller. All that is left is for the adhesive to dry. Heavy traffic should be avoided for a day and it will be set. Henry guarantees this bond for ten years.

Henry's GL62 uses a latex base and is a smooth, off-white paste. According to its MSDS sheet, it has a 0 g/L V.O.C. It also has a V.O.C. emissions level that is 97% lower than the minimum standards set by Carpet and Rug Institute. Instead of a solvent base, it uses water. In fact, the only major chemicals being off gassed are Carbon Dioxide and Carbon Monoxide, which come from the degradation of almost any organic compound. GL62 does not include any hazardous ingredients they are required to list. Overall, it has few health hazards, the only ones being exposure to eyes and skin, due to its high pH level of 9.3.

We do not really know the manufacturing habits of the W.W. Henry Company. We know the 4-gallon plastic pails the chemical comes in are not recyclable, though. They are supposed to go to landfills, which is a negative for the environment. The company has a manufacturing plant in Bourbonnais, Illinois which is not that far for shipping and transportation. That is good for the environment. We do not know if they used local resources or protected the environment in which they work. However, we believe that their system is probably better than most other companies. Their product does not have any hazardous chemicals in it, so the likelihood of such chemicals being used in the manufacturing are low. If a company is willing to work hard to make a safer product, they are probably working hard to make their business a safer place for the environment (W.W. Henry Company). As a product, GL62 can compete with the best of the products in the market today. It works extremely well, and it makes the workplace

safer for installers because of the low emissions. It is slightly more expensive than the industry standards at about 68.06 cents per square yard, but it is far safer for the people that will be using the space. Henry's Greenline GL62 seems like an all around good product to use.

In our analysis of different carpet adhesives, we contacted a local flooring specialist to see what is used in practice. We talked with Jerry Behr of Behr's USA Flooring in Dundas. He uses Para Chem Powerhold 4000 carpet adhesive for the majority of his jobs.

Based on the research of this product, it appears not to be as common as other adhesives. Both 'yahoo' and 'google' search engines does not find any information on the product. The product is not displayed on the official 'Para Chem' website. Yet, according to Mr. Behr, someone with a lot of carpet adhesive experience, the product performs to that of his customer's standards.

Powerhold 4000 Multi-Purpose Quick Tack is a low solvent, extremely fast setting adhesive for installing most carpet used in direct glue down applications and mineral fibrous backed sheet goods. The tech-sheet advertises that the product is good for the "speedy" installer. It has good re-bond properties and sets a firm tough bond line (Powerhold 4000).

The only hazardous ingredient is methanol. Methanol (CH_3OH) is a monohydric alcohol. It reacts with certain acids to form methyl esters. Small internal doses, continued inhalation of the vapor, or prolonged exposure of the skin to the liquid may cause blindness. Methanol consists of 1.81% of the adhesive by weight. The ACGIH TLV is 200 ppm, skin (MSDS). "Threshold Limit Values (TLV's) are guidelines (not standards) prepared by the American Conference of Governmental industrial Hygienists, Inc (ACGIH) to assist industrial hygienists in making decisions regarding safe levels of exposure to various hazards found in the workplace. A TLV reflects the level of exposure that the typical worker can experience without an

unreasonable risk of disease or injury. TLVs are not quantitative estimates of risk at different exposure levels or by different routes of exposure. The U.S. Occupational Health and Safety Administration use the same standard” (www.ilpi.com/msds/ref.tiv.html). The adhesive contains no carcinogenic ingredients. Dried material may produce CO, CO₂, H₂O, N_xO, and other products if burned (MSDS). The pH of the material is 9.7 and releases 22 grams volatile organic compounds/liter of material, based on no solvent (MSDS). In a scale from 1 to 4, the adhesive ranked a 1 in health, a 1 in flammability, and a 0 in reactivity. The number 1 coordinates to a Hazard rating of ‘slight’.

While the adhesive is good for more difficult to install carpet backing, it is not recommended for vinyl backed carpet, vinyl cushion backed sheet goods or urethane unitary carpeting (Powerhold 4000).

These qualities compliment the work of a professional flooring specialist. Because many professionals of this kind rely highly on their reputation and installing performance, they require an ‘aggressive’ adhesive that will set quickly and will work in difficult situations. Often professionals are on a timeline and/or must install a large amount of carpet in a given time period. This requires a fast acting adhesive. In addition, because the professional is purchasing one type of adhesive in bulk, he or she cannot afford to come across a situation where the given adhesive will not perform. Thus, they must error on the side of caution and use an adhesive that performs under more extreme situations. These factors play into the reasons why Jerry Behr uses this adhesive and not an adhesive with more environmentally friendly or ‘green’ properties. When Jerry was asked if he ever uses a ‘green’ adhesive, he replied that he only uses a different product on the customer’s request. Ultimately, like many other environmental products, the market (or in other words, the consumer) will always determine the progress of industrial

standards. In general, the ‘greener’ adhesive costs more. This is largely due to the fact that until the demand grows, the cost is greater to produce and market the smaller amounts. And until indoor air quality and environmental practices take priority over costs, the consumer will pay the flooring specialist to install their carpet at the lowest cost. While some people might think that it is the specialist’s ethical duty to consider the products that they use and the potential health effects on their customers, their practices are totally dependant on the consumer’s choices. In the end, it is up to the customer to be an informed consumer.



Figure 3 3M's Blue Glue

Another one of the four products we choose to investigate was 3M’s Blue Glue carpet adhesive. At first it was thought that 3M would be a good place to look for a quality product simply from the name reputation that 3M has. And though their product may be a high quality adhesive, from an environmental standpoint, there is a lot lacking from this product. 3M’s customer service representatives were not the most helpful people when it came to filling out the environmental impact questioner as they themselves did not know their product that well, and seemed to be

unable to get us in contact with someone that could. The material safety data sheet we were able to obtain for the product lists water and acrylic polymers as the major components to the adhesive, though there are enough more volatile components in this product to create cause for alarm. Sodium dodecylbenzenesulfaonate and ammonium hydroxide give the blue glue its distinct odor. (MSDS) Blue glue was also by far the most expensive product to use from all

those researched at \$1.60 per square yard of floor coverage. The highly inflated price was attributed to the products brand name by industry consults. The 3M product had been listed to off gas one gram per liter of volatile organic compounds (V.O.C.'s) which placed it at a threshold level preventing it from coming remotely close to obtaining the Carpet and Rug Institutes green label certification, which from an industrial standpoint is a must in environmentally friendly developments. From a health effects stand point blue glue is a fairly caustic product for the human body. It is stated as a moderate eye irritant by causing redness, pain, swelling, tearing and blurred vision from contact with the product. Mild skin irritation with localized redness and swelling from prolonged contact with dermal tissue. The products' off gassing causes upper respiratory irritation which can produce symptoms of coughing, sneezing, headache, nasal discharge and nasal and throat pain. If the product is ingested, gastrointestinal irritation is expected, with symptoms of abdominal pain, nausea, diarrhea, and vomiting. (MSDS) As a safety precaution, if the product is to catch fire, it is highly recommended that only trained emergency fire personnel deal with the blaze, as the product will produce toxic noxious chemicals that, if ingested, would most likely be fatal at those levels. (MSDS) Though blue glue is rated at only having one gram of V.O.C.'s off gassing, 58-61% of the product is rated as a volatile hazard. Though we were not able to obtain specific guidelines for product disposal, extreme care is to be given if the product is to be incinerated as it produces high levels of aldehydes, carbon monoxides, carbon dioxides, and ketones. (MSDS) Excess product waste disposal can be sent to the facility's specifically rated at hazardous chemical disposal processing. The NFPA hazard classification for blue glue gives the product a label of a two for health effects rating it as a moderate hazard for short-term exposure. (MSDS)

A contrasting product produced by CHAPCO, their SS475, is a slightly better choice. One customer service representative stated the product is calculated at emitting zero grams of V.O.C.'s and thus was able to obtain the Carpet and Rug Institute's green label certification. On the MSDS sheet for SS475, no toxic chemicals as required to be reported by in section III of Title Three and of 40 CFR 372. (MSDS) The only off gassing the product produces are carbon dioxide and carbon monoxide when burned with co-flammable materials. The only routes of biological entry that are assumed would be through the skin or through inhalation of the product, but risk is low when proper industrial hygiene and safety practices are followed. There have not been any reported health hazards associated with acute exposure to the product, or any possible known long term effects from working with it at the time the MSDS was prepared. Also none of the components that make up the adhesive are on the list of known carcinogens or possible carcinogens. Though it is still recommended that adequate ventilation be in place while using the product until it has fully dried. The product being mostly water based, it can easily be cleaned up by use of warm soapy water. And any excess spill can be scrapped up and disposed up with other refuse. CHAPCO had the lowest cost of all the products surveyed at a low cost of \$0.40 per square yard of adhesion. Not much other information was able to be obtained as to the products durability, quality, or environmentally friendly practices used in the production of the product, but as the product has taken the effort of making sure their product was able to obtain the Carpet and Rug Institute's Green Seal Certification one can assume other practices of the company would also follow environmentally conscious considerations in the production of their products.

Talking with Pete Sandberg, Director of Facilities at Saint Olaf College, to discuss the standards the college uses when installing carpet to follow the new college guidelines for

environmentally sound practices, the Carpet and Rug Institute’s Green Label Certification that we used in our study is the same symbol recognized by the college as being a prime choice when installing new products. This was much of a reassurance that we had been on the right track in our research.

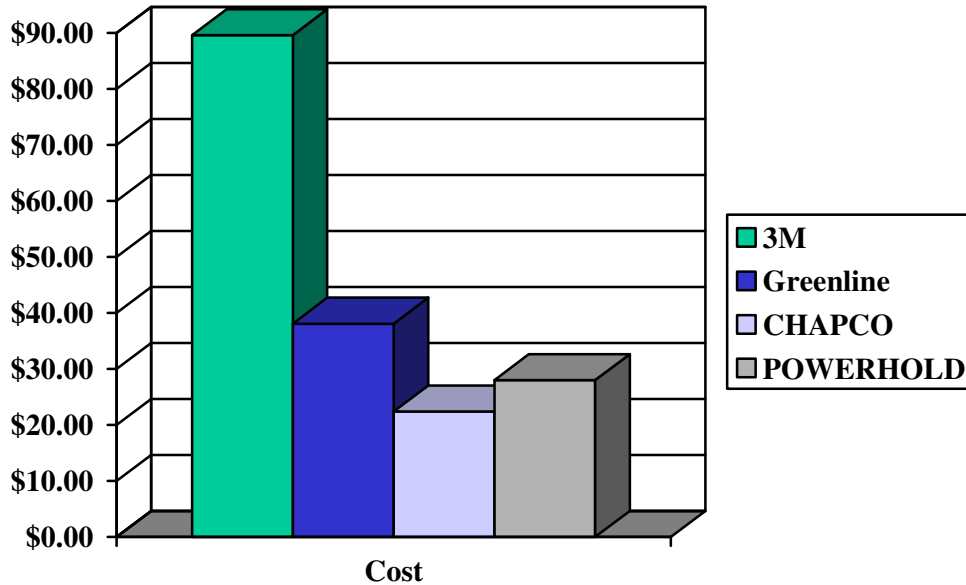


Figure 4 Cost of Product Use for 21 x 24ft room

With four products to compare from varying sectors of industry we had a hard choice in front of us when deciding the product we would recommend. Ultimately without all the information that we would have liked to have been able to obtain for the said products in comparison, it is impossible for us to give a definitive answer as to which product is absolutely the best environmental choice. Decision makers all the time simply step up to bat and make the best choice possible with the information they have to help them form their opinion, and in a similar light that is how we choose to recommend Henry’s Greenline GL62 as the carpet adhesive to be the most environmentally friendly. With a moderately low cost when compared across the board with the other products studied, environmental consciousness would not be

stretching the colleges' budget much more over the standard of carpet layers. Greenline also set many industry precedents with their products meeting and exceeding all the Carpet and Rug Institute's standards by producing a truly Green product with virtually no off gassing to speak of. Henry's also stands behind their product by placing a full 10-year warranty on the strength of their adhesives to bond and continually stay that way for the life of the common industrial installation. The other products, in general, just didn't keep the same set of standards. The Blue Glue was filled with hazardous chemicals. They are a local company, which would have been a positive for them, but they aren't really worrying about the environment. Also, their product wasn't as versatile as the Henry's. It could only be used with a specific type of carpeting. 3M's product was the worst one we looked at. The next worst was the Powerhold 4000. We did not expect much from it, though. We just wanted an industry standard to compare with. It was cheap, but it came at a price to the environment. They are not locally based, and do not have CRI green label certification. The Chapco product, however, was actually a fairly good one and would have been our second choice. It didn't meet the same extremely high standards of the Henry Company, but it did have CRI green label certification. It is fairly close by, in Illinois, and the product has 0g/L calculated V.O.C. content. It is also a cheap product, costing only 40 cents per square yard. Even so, Henry's Greenline GL62 is the carpet adhesive of choice for the environmentally minded consumer.

Kyllo Hanson Smith

Works Cited

Appendix A

SPECIFIER NOTE: THIS DOCUMENT IS INTENDED TO BE A GUIDE FOR RESEARCHING ENVIRONMENTAL ISSUES RELATIVE TO BUILDING PRODUCTS. ISSUES ARE ORGANIZED UNDER THREE PRIMARY CATEGORIES: RESOURCE MANAGEMENT, TOXICITY, AND PERFORMANCE.

ENVIRONMENTAL IMPACT QUESTIONNAIRE (EIQ)

I. DIRECTIONS

A. Complete the following questionnaire and submit for review to:

B. Relate information concerning only one product per questionnaire.

C. All questions may not apply to every product or manufacturer. It is not expected the manufacturer will have addressed all of the environmental concerns expressed in the EIQ.

1. Respond to every question even if response is “not available”, “not applicable”, or “no”.
2. Attach additional sheets as required. Reference additional sheets to correspond with the question number.

II. IDENTIFICATION

A. Material/Product: Carpet adhesive

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Brand Name: 3M Blue Glue NF Carpet Adhesive

Manufacturer: 3M

What is the primary use or application for this product?

Adhere carpet to a flooring surface.

B. Contact for EIQ:

Name: _____ Title: _____

Address: Saint Paul MN Zip Code: 55144-1000

Telephone: 1-800-364-3577 FAX: _____ Date: _____

III. RESOURCE MANAGEMENT

A. Renewable Resources:

1. List renewable resources used as product raw materials. Provide percentage amounts in relation to complete (100 percent) product.

Renewable Resource

Percentage

2. Does manufacturer obtain raw materials or fabricate this product outside of the United States: Y N?

- a. If yes, are United States environmental standards or more strict standards followed in these countries: Y N?
- b. List countries involved.

B. Managed Resources:

1. Does extraction of product raw materials or fabrication of this product affect endangered specie(s): Y N?

- a. If yes, list species and describe effect, including methods for negative effects.

<u>Endangered Species</u>	<u>Effect</u>
---------------------------	---------------

2. Products Containing Wood: Are wood materials obtained from certified sustainable forestry operations: Y N?

- a. If yes, provide name of certification organization for each wood species being used in this project.

<u>Species</u>	<u>Certification Organization</u>
----------------	-----------------------------------

b. If no, state where the product resources are produced and describe forestry operations.

Product Resources

Forestry Operations

C. Recycled Content:

1. List recycled materials used as product raw materials; distinguish pre-consumer and post-consumer materials. Provide percentage amounts in relation to complete (100 percent) product.

Recycled Material

% Pre-Consumer % Post-

Consumer

D. Embodied Energy:

1. Product Transport:

a. Where are raw materials acquired? Identify state and country.

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<u>Country)</u>	<u>Raw Material</u>	<u>Source (State and</u>

b. Describe means of transporting raw materials to the manufacturing plant.

<u>Raw Material</u>	<u>Transportation</u>

c. Where is product manufactured/fabricated? Identify state and country.

d. Is the product warehoused locally, regionally, or nationally?

e. Describe means of transporting product to distribution facilities.

2. Production Energy: List energy sources used in production process; indicate which are renewable energy sources (e.g. wind, solar). Provide percentage amounts in relation to complete (100 percent) product.

<u>Percentage</u>	<u>Energy Sources</u>	<u>Renewable</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

3. Provide an embodied energy study of the product from extraction of raw materials through production and assembly. Include an estimate for the total number of BTU's required per pound of finished products. Identify parameters for study.

4. Describe measures the manufacturer has taken to minimize energy usage in the production process.

E. Reuse/Recyclability/Disposal:

1. Reuse:

- a. Can product be reused directly (in same or similar use): ____Y ____N?
- b. If yes, discuss the possibility of direct reuse of the product after project

demolition.

2. Recycling:

- a. Can product be recycled: ____Y ____N?
- b. If yes, list the parts of the product which can be post-consumer recycled into raw materials for the product and the parts which can be post-

consumer recycled into other
in relation to complete (100 percent)

types of items. Provide percentage amounts
product.

Post-Consumer - Raw

Post-Consumer - Other

Percentage

_____	_____
_____	_____
_____	_____
_____	_____

- c. If yes, describe the process of separation of the parts for post-consumer recycling from the product.

- d. If yes, list current markets using recycled materials from the product.

- e. If yes, estimate the practical number of times this item can be recycled.

- 3. Describe the manufacturer's policy and program to facilitate the recycling or reuse of its product by accepting product returns at the end of their "useful life".

IV. TOXICITY/HAZARDOUS MATERIALS

- A. Toxic/Hazardous By-Products:

- 1. List the production wastes involved with the manufacture of this item. Distinguish the production wastes between toxic and non-toxic. Provide percentage amounts in relation to complete (100 percent) product.

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<u>Percentage</u>	<u>Toxic</u>	<u>Non-Toxic</u>
	_____	water 55-65%
35-45%	Acrylic Polymer	_____
0.1-0.75%	Acrylic Polymer	_____
0.1-0.75%	Ammonia	_____
0.01-0.2%	ToLucen	

2. Estimate the quantity of production waste produced per unit of finished product.

3. Is reclamation of production waste done on site: ___Y ___N? With outside services:
___Y ___N?

a. If outside services are used, list companies involved.

4. Is waste water reclaimed by manufacturer: ___Y ___N?

a. If yes, describe the process of recycling/reuse of waste water.

5. Describe the manufacturer's active steps to minimize or eliminate production wastes; include process of liquid and solid waste material treatment or reclamation if performed at manufacturing site.

6. Describe the manufacturing procedures and chemicals involved that would be considered better than industry standard.

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B. Toxic/Hazardous Contents (carcinogens and other hazards inherent in product/material):

1. Provide a complete chemical profile of the item; include all chemical components and provide percentage amounts in relation to complete (100 percent) product; identify biocides (mildewcides or in-can preservatives) and carcinogens listed by any of the following:

- a. United States Environmental Protection Agency (EPA) Carcinogen Assessment Group (CAG) list of carcinogens.
- b. Clean Air Act Sections 109, 111, and 112.
- c. The National Toxicology Program's latest published "Annual Report on Carcinogens".
- d. IARC Human Carcinogens (Group 1, 2A, and 2B).
- e. California Proposition 65.

<u>Percentage</u>	<u>Chemical</u>	<u>Carcinogen</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

C. Material Safety Data Sheet (MSDS):

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1. Provide Material Safety Data Sheet (MSDS).

a. Articles: Finished products which are manufactured off-site and shipped to the project for installation while conforming to Title 29 of the Code of Federal Regulations, OSHA Hazard Communication Regulation 29CFR 1910.1200, Section (b)5 and Section (c) are defined as articles. If by being defined as an article, a MSDS has not been developed for a particular product, then provide MSDS on raw materials, goods, and items used in the fabrication of that article.

D. Outgassing/Reactivity:

1. Chlorofluorocarbon (CFC):

a. Are CFC's or HCFC's used in the manufacture and/or content of the item specified: ____Y ____N?

b. If CFC's or HCFC's were previously used in the product and/or its manufacture, describe measures taken by manufacturer to eliminate their use.

2. Indoor Air Quality:

a. Does the product outgas (emit) carcinogens or other hazardous substances into the air after installation, including final curing/drying: XY ____N?

b. If yes, submit IAQ test report.

Off gasses Carbon dioxide, carbon monoxide, aldehydes, ketones, toxic vapors, gases and particulates.

E. Electromagnetic Radiation:

1. Does the product emit electromagnetic radiation: ____Y ____N?

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2. If yes, at what rate per hour? _____
3. If yes, describe methods for installation, use, and maintenance of product to minimize generation of and occupant exposure to electromagnetic radiation.

F. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the manufacturer meet all federal, state, and local environmental laws, including laws governing air emissions, waste water treatment, and solid waste disposal/treatment:

___Y ___N?

2. Has the manufacturer met the above criteria for the previous five years: ___Y ___N?
3. List the applicable standard.

4. Does the product meet applicable industry standards, such as ASTM, Green Seal, manufacturing standards, LA or NY research report numbers, and UL approvals: ___Y ___N? List these standards.

V. PERFORMANCE - INSTALLATION

A. Environmental Procedures/Precautions:

1. Describe special procedures and precautions to be used while handling and installing the product:

2. Identify accessories, such as fasteners, sealers, and adhesives that are non-toxic (or less toxic than industry standard), energy efficient, or recycled or recyclable products?

B. Installation Energy:

1. Product Transport: List the means to transport the finished product to the construction site.

2. Installation: List energy means and describe energy requirements for installation of the product.

C. Construction Waste:

1. List the recommended method(s) for proper products disposal; stipulate preferred method and restrictions which might apply.

Dried materials are landfilled.

2. Comment on the environmental impact of the product as a waste material.

3. Packaging:

a. Describe packaging for the product.

Metal buckets

b. Does manufacturer accept return of used packaging for reuse: ___Y ___X___N?

c. If yes, state limitations and procedures for packaging return.

VI. PERFORMANCE - OPERATIONS

A. Maintenance

1. Describe the recommended cleaning and maintenance for the product using products which have minimal VOC emission.

2. Estimate the “useful life” expectancy for this product.

The product dries and no longer becomes usable as a carpet adhesive.

3. Are replacement parts available: ___Y ___N?

a. If yes, can replacement parts be installed in the field: ___Y ___N?

4. Provide a copy of the life cycle analysis for this product.

5. Provide a copy of the manufacturer’s warranty for this product.

B. Energy Efficiency (energy required to operate/maintain):

1. Estimate BTU’s required to operate the product when new? _____; after five years? _____; after ten years? _____

C. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the product meet all federal, state, and local environmental laws, including laws governing energy efficiency and air emissions: ___Y ___N?

2. Has the product met the above criteria for the previous five years: ___Y ___N?

3. List the applicable standards.

VII. CORPORATE COMMITMENT

A. Corporate Environmental Policy:

1. Provide copy of manufacturer's stated environmental policies.

END OF ENVIRONMENTAL IMPACT QUESTIONNAIRE

Appendix B

SPECIFIER NOTE: THIS DOCUMENT IS INTENDED TO BE A GUIDE FOR RESEARCHING ENVIRONMENTAL ISSUES RELATIVE TO BUILDING PRODUCTS. ISSUES ARE ORGANIZED UNDER THREE PRIMARY CATEGORIES: RESOURCE MANAGEMENT, TOXICITY, AND PERFORMANCE.

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4. Attach additional sheets as required. Reference additional sheets to correspond with the question number.

II. IDENTIFICATION

- A. Material/Product: Greenline GL62 Carpet Adhesive

Brand Name: Henry’s Greenline GL62

Kyllo Hanson Smith

Manufacturer: Henry's

What is the primary use or application for this product?

Adhere Carpet to flooring surface.

B. Contact for EIQ:

Name: _____ Title:

Address 400 Ardex park Drive, Aliquippa, PA Zip Code: 15001

Telephone: 724-203-8499 FAX: _____ Date: _____

III. RESOURCE MANAGEMENT

A. Renewable Resources:

1. List renewable resources used as product raw materials. Provide percentage amounts in relation to complete (100 percent) product.

Renewable Resource

Percentage

2. Does manufacturer obtain raw materials or fabricate this product outside of the United States: Y N?

c. If yes, are United States environmental standards or more strict standards followed in these countries: Y N?

d. List countries involved.

B. Managed Resources:

1. Does extraction of product raw materials or fabrication of this product affect endangered specie(s): Y N?

b. If yes, list species and describe effect, including methods for negative effects.

Endangered Species Effect

2. Products Containing Wood: Are wood materials obtained from certified sustainable forestry operations: Y N?

a. If yes, provide name of certification organization for each wood species being used in this project.

Species Certification Organization

b. If no, state where the product resources are produced and describe forestry operations.

Product Resources

Forestry Operations

C. Recycled Content:

1. List recycled materials used as product raw materials; distinguish pre-consumer and post-consumer materials. Provide percentage amounts in relation to complete (100 percent) product.

Recycled Material

% Pre-Consumer % Post-

Consumer

D. Embodied Energy:

1. Product Transport:

a. Where are raw materials acquired? Identify state and country.

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<u>Country)</u>	<u>Raw Material</u>	<u>Source (State and</u>

b. Describe means of transporting raw materials to the manufacturing plant.

<u>Raw Material</u>	<u>Transportation</u>

c. Where is product manufactured/fabricated? Identify state and country.

d. Is the product warehoused locally, regionally, or nationally?

e. Describe means of transporting product to distribution facilities.

2. Production Energy: List energy sources used in production process; indicate which are renewable energy sources (e.g. wind, solar). Provide percentage amounts in relation to complete (100 percent) product.

<u>Percentage</u>	<u>Energy Sources</u>	<u>Renewable</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

3. Provide an embodied energy study of the product from extraction of raw materials through production and assembly. Include an estimate for the total number of BTU's required per pound of finished products. Identify parameters for study.

4. Describe measures the manufacturer has taken to minimize energy usage in the production process.

E. Reuse/Recyclability/Disposal:

1. Reuse:

- a. Can product be reused directly (in same or similar use): ____Y ____N?
- b. If yes, discuss the possibility of direct reuse of the product after project

demolition.

2. Recycling:

- a. Can product be recycled: ____Y ____N?
- b. If yes, list the parts of the product which can be post-consumer recycled into raw materials for the product and the parts which can be post-

consumer recycled into other
in relation to complete (100 percent)

types of items. Provide percentage amounts
product.

Post-Consumer - Raw

Post-Consumer - Other

Percentage

- c. If yes, describe the process of separation of the parts for post-consumer recycling from the product.

- d. If yes, list current markets using recycled materials from the product.

- e. If yes, estimate the practical number of times this item can be recycled.

- 3. Describe the manufacturer's policy and program to facilitate the recycling or reuse of its product by accepting product returns at the end of their "useful life".

IV. TOXICITY/HAZARDOUS MATERIALS

- A. Toxic/Hazardous By-Products:

- 1. List the production wastes involved with the manufacture of this item. Distinguish the production wastes between toxic and non-toxic. Provide percentage amounts in relation to complete (100 percent) product.

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	<u>Toxic</u>	<u>Non-Toxic</u>
<u>Percentage</u>		

2. Estimate the quantity of production waste produced per unit of finished product.

3. Is reclamation of production waste done on site: ___Y ___N? With outside services: ___Y ___N?

a. If outside services are used, list companies involved.

4. Is waste water reclaimed by manufacturer: ___Y ___N?

a. If yes, describe the process of recycling/reuse of waste water.

5. Describe the manufacturer's active steps to minimize or eliminate production wastes; include process of liquid and solid waste material treatment or reclamation if performed at manufacturing site.

6. Describe the manufacturing procedures and chemicals involved that would be considered better than industry standard.

B. Toxic/Hazardous Contents (carcinogens and other hazards inherent in product/material):

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1. Provide a complete chemical profile of the item; include all chemical components and provide percentage amounts in relation to complete (100 percent) product; identify biocides (mildewcides or in-can preservatives) and carcinogens listed by any of the following:

- a. United States Environmental Protection Agency (EPA) Carcinogen Assessment Group (CAG) list of carcinogens.
- b. Clean Air Act Sections 109, 111, and 112.
- c. The National Toxicology Program’s latest published “Annual Report on Carcinogens”.
- d. IARC Human Carcinogens (Group 1, 2A, and 2B).
- e. California Proposition 65.

<u>Percentage</u>	<u>Chemical</u>	<u>Carcinogen</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

- C. Material Safety Data Sheet (MSDS):
 - 1. Provide Material Safety Data Sheet (MSDS).

Kyllo Hanson Smith

a. Articles: Finished products which are manufactured off-site and shipped to the project for installation while conforming to Title 29 of the Code of Federal Regulations, OSHA Hazard Communication Regulation 29CRF 1910.1200, Section (b)5 and Section (c) are defined as articles. If by being defined as an article, a MSDS has not been developed for a particular product, then provide MSDS on raw materials, goods, and items used in the fabrication of that article.

D. Outgassing/Reactivity:

1. Chlorofluorocarbon (CFC):

a. Are CFC's or HCFC's used in the manufacture and/or content of the item specified: ___Y ___N?

b. If CFC's or HCFC's were previously used in the product and/or its manufacture, describe measures taken by manufacturer to eliminate their use.

2. Indoor Air Quality:

a. Does the product outgas (emit) carcinogens or other hazardous substances into the air after installation, including final curing/drying: _X_Y ___N?

b. If yes, submit IAQ test report.

Off gasses carbon dioxide and carbon monoxide

E. Electromagnetic Radiation:

1. Does the product emit electromagnetic radiation: ___Y ___N?

2. If yes, at what rate per hour? _____

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3. If yes, describe methods for installation, use, and maintenance of product to minimize generation of and occupant exposure to electromagnetic radiation.

F. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the manufacturer meet all federal, state, and local environmental laws, including laws governing air emissions, waste water treatment, and solid waste disposal/treatment:

___Y ___N?

2. Has the manufacturer met the above criteria for the previous five years: ___Y ___N?

3. List the applicable standard.

4. Does the product meet applicable industry standards, such as ASTM, Green Seal, manufacturing standards, LA or NY research report numbers, and UL approvals: ___Y ___N? List these standards.

V. PERFORMANCE - INSTALLATION

A. Environmental Procedures/Precautions:

1. Describe special procedures and precautions to be used while handling and installing the product:

Use gloves, work in ventilated area, avoid skin and eye contact.

2. Identify accessories, such as fasteners, sealers, and adhesives that are non-toxic (or less toxic than industry standard), energy efficient, or recycled or recyclable products?
-
-
-
-
-
-
-
-

B. Installation Energy:

1. Product Transport: List the means to transport the finished product to the construction site.

2. Installation: List energy means and describe energy requirements for installation of the product.

C. Construction Waste:

1. List the recommended method(s) for proper products disposal; stipulate preferred method and restrictions which might apply.

Use local, federal, and state waste disposal regulations

2. Comment on the environmental impact of the product as a waste material.

Unknown

3. Packaging:

a. Describe packaging for the product.

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One gallon bucket

- b. Does manufacturer accept return of used packaging for reuse: ____Y __X__N?
- c. If yes, state limitations and procedures for packaging return.

VI. PERFORMANCE - OPERATIONS

A. Maintenance

- 1. Describe the recommended cleaning and maintenance for the product using products which have minimal VOC emission.

- 2. Estimate the “useful life” expectancy for this product.

- 3. Are replacement parts available: ___Y ___N?
 - a. If yes, can replacement parts be installed in the field: ___Y ___N?
- 4. Provide a copy of the life cycle analysis for this product.
- 5. Provide a copy of the manufacturer's warranty for this product.

B. Energy Efficiency (energy required to operate/maintain):

- 1. Estimate BTU's required to operate the product when new? _____; after five years? _____; after ten years? _____

C. Compliance with Regulations (Environmental Statutory Compliance):

- 1. Does the product meet all federal, state, and local environmental laws, including laws governing energy efficiency and air emissions: ___Y ___N?
- 2. Has the product met the above criteria for the previous five years: ___Y ___N?
- 3. List the applicable standards.

VII. CORPORATE COMMITMENT

A. Corporate Environmental Policy:

1. Provide copy of manufacturer's stated environmental policies.

END OF ENVIRONMENTAL IMPACT QUESTIONNAIRE

Appendix C

SPECIFIER NOTE: THIS DOCUMENT IS INTENDED TO BE A GUIDE FOR RESEARCHING ENVIRONMENTAL ISSUES RELATIVE TO BUILDING PRODUCTS. ISSUES ARE ORGANIZED UNDER THREE PRIMARY CATEGORIES: RESOURCE MANAGEMENT, TOXICITY, AND PERFORMANCE.

ENVIRONMENTAL IMPACT QUESTIONNAIRE (EIQ)

III. DIRECTIONS

A. Complete the following questionnaire and submit for review to:

B. Relate information concerning only one product per questionnaire.

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- C. All questions may not apply to every product or manufacturer. It is not expected the manufacturer will have addressed all of the environmental concerns expressed in the EIQ.
- 5. Respond to every question even if response is “not available”, “not applicable”, or “no”.
- 6. Attach additional sheets as required. Reference additional sheets to correspond with the question number.

II. IDENTIFICATION

A. Material/Product: Carpet Adhesive

Brand Name: SS475 High Track Carpet Adhesive

Manufacturer: Chicago Adhesive Product Co.

What is the primary use or application for this product?

A glue used to adhere carpet to a flooring surface.

B. Contact for EIQ:

Name: _____ Title: _____

Address: 1165 Arbor Drive, Romeoville, IL Zip Code: 60446

Telephone: 630-679-9100 FAX: _____ Date: _____

III. RESOURCE MANAGEMENT

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A. Renewable Resources:

1. List renewable resources used as product raw materials. Provide percentage amounts in relation to complete (100 percent) product.

Renewable Resource

Percentage

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2. Does manufacturer obtain raw materials or fabricate this product outside of the United States: ____Y ____N?

e. If yes, are United States environmental standards or more strict standards followed in these countries: ____Y ____N?

f. List countries involved.

B. Managed Resources:

1. Does extraction of product raw materials or fabrication of this product affect endangered specie(s): ____Y ____N?

c. If yes, list species and describe effect, including methods for negative effects.

Endangered Species

Effect

2. Products Containing Wood: Are wood materials obtained from certified sustainable forestry operations: ___Y ___N?

a. If yes, provide name of certification organization for each wood species being used in this project.

<u>Species</u>	<u>Certification Organization</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

b. If no, state where the product resources are produced and describe forestry operations.

<u>Product Resources</u>	<u>Forestry Operations</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

C. Recycled Content:

1. List recycled materials used as product raw materials; distinguish pre-consumer and post-consumer materials. Provide percentage amounts in relation to complete (100 percent) product.

<u>Recycled Material</u>	<u>% Pre-Consumer</u>	<u>% Post-Consumer</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

D. Embodied Energy:

1. Product Transport:

a. Where are raw materials acquired? Identify state and country.

<u>Raw Material</u>	<u>Source (State and Country)</u>
---------------------	-----------------------------------

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b. Describe means of transporting raw materials to the manufacturing plant.

<u>Raw Material</u>	<u>Transportation</u>
---------------------	-----------------------

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<hr/>	<hr/>
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c. Where is product manufactured/fabricated? Identify state and country.

d. Is the product warehoused locally, regionally, or nationally?

e. Describe means of transporting product to distribution facilities.

2. Production Energy: List energy sources used in production process; indicate which are renewable energy sources (e.g. wind, solar). Provide percentage amounts in relation to complete (100 percent) product.

<u>Percentage</u>	<u>Energy Sources</u>	<u>Renewable</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

3. Provide an embodied energy study of the product from extraction of raw materials through production and assembly. Include an estimate for the total number of BTU's required per pound of finished products. Identify parameters for study.

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4. Describe measures the manufacturer has taken to minimize energy usage in the production process.

E. Reuse/Recyclability/Disposal:

1. Reuse:

- a. Can product be reused directly (in same or similar use): ____Y __X_N?
- b. If yes, discuss the possibility of direct reuse of the product after project

demolition.

2. Recycling:

- a. Can product be recycled: ____Y __X_N?
- b. If yes, list the parts of the product which can be post-consumer recycled into raw materials for the product and the parts which can be post-

consumer recycled into other types of items. Provide percentage amounts in relation to complete (100 percent) product.

Post-Consumer - Raw

Post-Consumer - Other

Percentage

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c. If yes, describe the process of separation of the parts for post-consumer recycling from the product.

d. If yes, list current markets using recycled materials from the product.

e. If yes, estimate the practical number of times this item can be recycled.

3. Describe the manufacturer's policy and program to facilitate the recycling or reuse of its product by accepting product returns at the end of their "useful life".

None Given

IV. TOXICITY/HAZARDOUS MATERIALS

A. Toxic/Hazardous By-Products:

1. List the production wastes involved with the manufacture of this item. Distinguish the production wastes between toxic and non-toxic. Provide percentage amounts in relation to complete (100 percent) product.

<u>Percentage</u>	<u>Toxic</u>	<u>Non-Toxic</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

2. Estimate the quantity of production waste produced per unit of finished product.

3. Is reclamation of production waste done on site: ___Y ___N? With outside services: ___Y ___N?

a. If outside services are used, list companies involved.

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4. Is waste water reclaimed by manufacturer: ____Y ____N?

a. If yes, describe the process of recycling/reuse of waste water.

5. Describe the manufacturer's active steps to minimize or eliminate production wastes;

include process of liquid and solid waste material treatment or reclamation if performed
at manufacturing site.

6. Describe the manufacturing procedures and chemicals involved that would be considered

better than industry standard.

B. Toxic/Hazardous Contents (carcinogens and other hazards inherent in product/material):

1. Provide a complete chemical profile of the item; include all chemical components and provide percentage amounts in relation to complete (100 percent) product; identify biocides (mildewcides or in-can preservatives) and carcinogens listed by any of the following:

- Group
- a. United States Environmental Protection Agency (EPA) Carcinogen Assessment (CAG) list of carcinogens.
 - b. Clean Air Act Sections 109, 111, and 112.
 - c. The National Toxicology Program's latest published "Annual Report on Carcinogens".
 - d. IARC Human Carcinogens (Group 1, 2A, and 2B).
 - e. California Proposition 65.

<u>Percentage</u>	<u>Chemical</u>	<u>Carcinogen</u>
	"No toxic chemicals used in the production"	___Y ___N _____
	"Or in the product itself"	___Y ___N _____
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

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C. Material Safety Data Sheet (MSDS):

1. Provide Material Safety Data Sheet (MSDS).

a. Articles: Finished products which are manufactured off-site and shipped to the project for installation while conforming to Title 29 of the Code of Federal Regulations, OSHA Hazard Communication Regulation 29CFR 1910.1200, Section (b)5 and Section (c) are defined as articles. If by being defined as an article, a MSDS has not been developed for a particular product, then provide MSDS on raw materials, goods, and items used in the fabrication of that article.

D. Outgassing/Reactivity:

1. Chlorofluorocarbon (CFC):

a. Are CFC's or HCFC's used in the manufacture and/or content of the item specified: ___Y ___N?

b. If CFC's or HCFC's were previously used in the product and/or its manufacture, describe measures taken by manufacturer to eliminate their use.

2. Indoor Air Quality:

a. Does the product outgas (emit) carcinogens or other hazardous substances into the air after installation, including final curing/drying: ___Y ___N?

b. If yes, submit IAQ test report.

E. Electromagnetic Radiation:

1. Does the product emit electromagnetic radiation: ___Y ___N?

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- 2. If yes, at what rate per hour? _____
- 3. If yes, describe methods for installation, use, and maintenance of product to minimize generation of and occupant exposure to electromagnetic radiation.

F. Compliance with Regulations (Environmental Statutory Compliance):

- 1. Does the manufacturer meet all federal, state, and local environmental laws, including laws governing air emissions, waste water treatment, and solid waste disposal/treatment:

___Y ___N?

- 2. Has the manufacturer met the above criteria for the previous five years: ___Y ___N?
- 3. List the applicable standard.

- 4. Does the product meet applicable industry standards, such as ASTM, Green Seal, manufacturing standards, LA or NY research report numbers, and UL approvals: ___Y ___N? List these standards.

V. PERFORMANCE - INSTALLATION

A. Environmental Procedures/Precautions:

1. Describe special procedures and precautions to be used while handling and installing the product:

2. Identify accessories, such as fasteners, sealers, and adhesives that are non-toxic (or less toxic than industry standard), energy efficient, or recycled or recyclable products?

B. Installation Energy:

1. Product Transport: List the means to transport the finished product to the construction site.

2. Installation: List energy means and describe energy requirements for installation of the product.

C. Construction Waste:

1. List the recommended method(s) for proper products disposal; stipulate preferred method and restrictions which might apply.

2. Comment on the environmental impact of the product as a waste material.

3. Packaging:

a. Describe packaging for the product.

b. Does manufacturer accept return of used packaging for reuse: ___Y ___N?

c. If yes, state limitations and procedures for packaging return.

VI. PERFORMANCE - OPERATIONS

A. Maintenance

1. Describe the recommended cleaning and maintenance for the product using products which have minimal VOC emission.

2. Estimate the “useful life” expectancy for this product.

3. Are replacement parts available: ___Y ___N?

a. If yes, can replacement parts be installed in the field: ___Y ___N?

4. Provide a copy of the life cycle analysis for this product.

5. Provide a copy of the manufacturer’s warranty for this product.

B. Energy Efficiency (energy required to operate/maintain):

1. Estimate BTU’s required to operate the product when new? _____; after five years? _____; after ten years? _____

C. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the product meet all federal, state, and local environmental laws, including laws governing energy efficiency and air emissions: ___Y ___N?

2. Has the product met the above criteria for the previous five years: ___Y ___N?

3. List the applicable standards.

VII. CORPORATE COMMITMENT

A. Corporate Environmental Policy:

1. Provide copy of manufacturer's stated environmental policies.

END OF ENVIRONMENTAL IMPACT QUESTIONNAIRE

Appendix D

SPECIFIER NOTE: THIS DOCUMENT IS INTENDED TO BE A GUIDE FOR RESEARCHING ENVIRONMENTAL ISSUES RELATIVE TO BUILDING PRODUCTS. ISSUES ARE ORGANIZED UNDER THREE PRIMARY CATEGORIES: RESOURCE MANAGEMENT, TOXICITY, AND PERFORMANCE.

ENVIRONMENTAL IMPACT QUESTIONNAIRE (EIQ)

IV. DIRECTIONS

- A. Complete the following questionnaire and submit for review to:

- B. Relate information concerning only one product per questionnaire.
- C. All questions may not apply to every product or manufacturer. It is not expected the manufacturer will have addressed all of the environmental concerns expressed in the EIQ.
 - 7. Respond to every question even if response is “not available”, “not applicable”, or “no”.
 - 8. Attach additional sheets as required. Reference additional sheets to correspond with the question number.

II. IDENTIFICATION

- A. Material/Product: Water based carpet adhesive

Brand Name: POWERHOLD 4000

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Manufacturer: Para-chem

What is the primary use or application for this product?

Adhering carpet to surfaces.

B. Contact for EIQ:

Name: _____ Title:

Address: P.O. Box 127, Simpsonville, SC _ Zip Code: 29681_

Telephone: _____ FAX: _____ Date:

III. RESOURCE MANAGEMENT

A. Renewable Resources:

1. List renewable resources used as product raw materials. Provide percentage amounts in relation to complete (100 percent) product.

Renewable Resource

Percentage

2. Does manufacturer obtain raw materials or fabricate this product outside of the United States: Y N?

g. If yes, are United States environmental standards or more strict standards followed in these countries: Y N?

h. List countries involved.

B. Managed Resources:

1. Does extraction of product raw materials or fabrication of this product affect endangered specie(s): Y N?

d. If yes, list species and describe effect, including methods for negative effects.

Endangered Species Effect

2. Products Containing Wood: Are wood materials obtained from certified sustainable forestry operations: Y N?

a. If yes, provide name of certification organization for each wood species being used in this project.

Species Certification Organization

b. If no, state where the product resources are produced and describe forestry operations.

Product Resources

Forestry Operations

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C. Recycled Content:

1. List recycled materials used as product raw materials; distinguish pre-consumer and post-consumer materials. Provide percentage amounts in relation to complete (100 percent) product.

Recycled Material

% Pre-Consumer % Post-

Consumer

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<hr/>	<hr/>

D. Embodied Energy:

1. Product Transport:

a. Where are raw materials acquired? Identify state and country.

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<u>Country)</u>	<u>Raw Material</u>	<u>Source (State and</u>

b. Describe means of transporting raw materials to the manufacturing plant.

<u>Raw Material</u>	<u>Transportation</u>

c. Where is product manufactured/fabricated? Identify state and country.

d. Is the product warehoused locally, regionally, or nationally?

e. Describe means of transporting product to distribution facilities.

2. Production Energy: List energy sources used in production process; indicate which are renewable energy sources (e.g. wind, solar). Provide percentage amounts in relation to complete (100 percent) product.

<u>Percentage</u>	<u>Energy Sources</u>	<u>Renewable</u>
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N
_____	_____	___Y ___N

3. Provide an embodied energy study of the product from extraction of raw materials through production and assembly. Include an estimate for the total number of BTU's required per pound of finished products. Identify parameters for study.

4. Describe measures the manufacturer has taken to minimize energy usage in the production process.

E. Reuse/Recyclability/Disposal:

1. Reuse:

- a. Can product be reused directly (in same or similar use): ____Y ____N?
- b. If yes, discuss the possibility of direct reuse of the product after project

demolition.

2. Recycling:

- a. Can product be recycled: ____Y ____N?
- b. If yes, list the parts of the product which can be post-consumer recycled into raw materials for the product and the parts which can be post-

consumer recycled into other
in relation to complete (100 percent)

types of items. Provide percentage amounts
product.

Post-Consumer - Raw

Post-Consumer - Other

Percentage

_____	_____
_____	_____
_____	_____
_____	_____

- c. If yes, describe the process of separation of the parts for post-consumer recycling from the product.

- d. If yes, list current markets using recycled materials from the product.

- e. If yes, estimate the practical number of times this item can be recycled.

- 3. Describe the manufacturer's policy and program to facilitate the recycling or reuse of its product by accepting product returns at the end of their "useful life".

IV. TOXICITY/HAZARDOUS MATERIALS

- A. Toxic/Hazardous By-Products:

- 1. List the production wastes involved with the manufacture of this item. Distinguish the production wastes between toxic and non-toxic. Provide percentage amounts in relation to complete (100 percent) product.

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	<u>Toxic</u>	<u>Non-Toxic</u>
<u>Percentage</u>	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

2. Estimate the quantity of production waste produced per unit of finished product.

3. Is reclamation of production waste done on site: ___Y ___N? With outside services:
___Y ___N?

a. If outside services are used, list companies involved.

4. Is waste water reclaimed by manufacturer: ___Y ___N?

a. If yes, describe the process of recycling/reuse of waste water.

5. Describe the manufacturer's active steps to minimize or eliminate production wastes; include process of liquid and solid waste material treatment or reclamation if performed at manufacturing site.

6. Describe the manufacturing procedures and chemicals involved that would be considered better than industry standard.

B. Toxic/Hazardous Contents (carcinogens and other hazards inherent in product/material):

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1. Provide a complete chemical profile of the item; include all chemical components and provide percentage amounts in relation to complete (100 percent) product; identify biocides (mildewcides or in-can preservatives) and carcinogens listed by any of the following:

- Group
- a. United States Environmental Protection Agency (EPA) Carcinogen Assessment (CAG) list of carcinogens.
 - b. Clean Air Act Sections 109, 111, and 112.
 - c. The National Toxicology Program's latest published "Annual Report on Carcinogens".
 - d. IARC Human Carcinogens (Group 1, 2A, and 2B).
 - e. California Proposition 65.

<u>Percentage</u>	<u>Chemical</u>	<u>Carcinogen</u>
	_Methanol_____	___Y ___N __1.8% ___
	_____	___Y ___N
	_____	___Y ___N
	_____	___Y ___N
	_____	___Y ___N
	_____	___Y ___N
	_____	___Y ___N

- C. Material Safety Data Sheet (MSDS):
- 1. Provide Material Safety Data Sheet (MSDS).

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a. Articles: Finished products which are manufactured off-site and shipped to the project for installation while conforming to Title 29 of the Code of Federal Regulations, OSHA Hazard Communication Regulation 29CRF 1910.1200, Section (b)5 and Section (c) are defined as articles. If by being defined as an article, a MSDS has not been developed for a particular product, then provide MSDS on raw materials, goods, and items used in the fabrication of that article.

D. Outgassing/Reactivity:

1. Chlorofluorocarbon (CFC):

a. Are CFC's or HCFC's used in the manufacture and/or content of the item specified: ___Y ___N?

b. If CFC's or HCFC's were previously used in the product and/or its manufacture, describe measures taken by manufacturer to eliminate their use.

2. Indoor Air Quality:

a. Does the product outgas (emit) carcinogens or other hazardous substances into the air after installation, including final curing/drying: _X_Y ___N?

e. If yes, submit IAQ test report.

It off gasses carbon monoxide, carbon dioxide, water vapor, and nitrogen oxides.

E. Electromagnetic Radiation:

1. Does the product emit electromagnetic radiation: ___Y ___N?

2. If yes, at what rate per hour? _____

Kyllo Hanson Smith

3. If yes, describe methods for installation, use, and maintenance of product to minimize generation of and occupant exposure to electromagnetic radiation.

F. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the manufacturer meet all federal, state, and local environmental laws, including laws governing air emissions, waste water treatment, and solid waste disposal/treatment:

___Y ___N?

2. Has the manufacturer met the above criteria for the previous five years: ___Y ___N?

3. List the applicable standard.

4. Does the product meet applicable industry standards, such as ASTM, Green Seal, manufacturing standards, LA or NY research report numbers, and UL approvals: ___Y ___N? List these standards.

V. PERFORMANCE - INSTALLATION

A. Environmental Procedures/Precautions:

1. Describe special procedures and precautions to be used while handling and installing the product:

2. Identify accessories, such as fasteners, sealers, and adhesives that are non-toxic (or less toxic than industry standard), energy efficient, or recycled or recyclable products?

B. Installation Energy:

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1. Product Transport: List the means to transport the finished product to the construction site.

2. Installation: List energy means and describe energy requirements for installation of the product.

C. Construction Waste:

1. List the recommended method(s) for proper products disposal; stipulate preferred method and restrictions which might apply.

In accordance with federal, state and local regulations.

2. Comment on the environmental impact of the product as a waste material.

3. Packaging:

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a. Describe packaging for the product.

A plastic bucket

b. Does manufacturer accept return of used packaging for reuse: ___Y _X _N?

c. If yes, state limitations and procedures for packaging return.

VI. PERFORMANCE - OPERATIONS

A. Maintenance

1. Describe the recommended cleaning and maintenance for the product using products which have minimal VOC emission.

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2. Estimate the “useful life” expectancy for this product.

3. Are replacement parts available: ___Y ___N?

a. If yes, can replacement parts be installed in the field: ___Y ___N?

4. Provide a copy of the life cycle analysis for this product.

5. Provide a copy of the manufacturer’s warranty for this product.

B. Energy Efficiency (energy required to operate/maintain):

1. Estimate BTU’s required to operate the product when new? _____; after five years? _____; after ten years? _____

C. Compliance with Regulations (Environmental Statutory Compliance):

1. Does the product meet all federal, state, and local environmental laws, including laws governing energy efficiency and air emissions: ___Y ___N?

2. Has the product met the above criteria for the previous five years: ___Y ___N?

3. List the applicable standards.

VII. CORPORATE COMMITMENT

A. Corporate Environmental Policy:

1. Provide copy of manufacturer's stated environmental policies.

END OF ENVIRONMENTAL IMPACT QUESTIONNAIRE