C/S Acrovyn®…there is a difference!

(and it's not just the product)

1. **Why is C/S placing so much attention and effort on Acrovyn 4000?** With the launch of Acrovyn 4000 we have eliminated PVC from the standard Acrovyn product line. The PVC-free PETG formula and texture arguably establishes Acrovyn as the leader in sustainable wall and door protection. Our commitment to "Create products that make buildings better" while reducing our overall impact on the environment has become a core value of C/S' mission. Leading voices in the design/build community expect suppliers to do their part in helping to secure a healthier environment for all of us.[i] With the launch of Acrovyn 4000, we are doing our part by honoring the leadership tradition of C/S while setting a higher standard for future generations of sustainable Acrovyn products.

   The Acrovyn® 4000 wall and door protection line contains no PBTs, is completely free of PVC and BPA, and offers the same high-impact strength and UL Class 1 fire rating as did original Acrovyn. Acrovyn 4000 has earned Cradle to Cradle Certification℠ and meets the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers 2004 (CA 01350) protocol for good indoor air quality. To enhance aesthetics, improve cleanability and hide abrasions, Acrovyn 4000 also features a new contemporary texture.

2. **Why did we do this?**

2A. Why PVC-free and what is the environmental impact of using it for a building material? There are strong arguments within the plastics community as to the safety of PVC. However, the arguments for human health and safety prevail.[ii] Vinyl Chloride Monomers, halogenated/bromated fire retardants, plasticizers and other materials added to enhance the physical performance and fire rating of PVC have all been shown to be harmful. Dioxin is among the top PBTs on EPA's Toxic[iii] list and is attributable to a number of materials, PVC being one. The environmental concerns of PVC have led numerous local authorities in the U.S. and several European countries to discourage the use of PVC.[iv]

2B. Is the standard wall protection line PVC-free? Yes. Our sheet, trims, caps, covers, gaskets, retainers, etc. are all PVC-free!

2C. Are the Chameleon simulated wood/metal patterns PVC-free? Yes. The material, patterned film and even the printed inks are all PVC-free; no competitor offers PVC-free patterned material.

2D. what is a PBT, what is its environmental impact and is Acrovyn 4000 PBT-Free? Persistent bioaccumulative toxins (PBTs) are toxic chemicals that remain in the environment and pose risk to human health and ecosystems. They are a threat because they do not break down easily in the environment, which is why they are described as persistent, and they can build up in the food chain over time, or bioaccumulate. Bioaccumulation refers to the

accumulation of substances such as pesticides or other organic chemicals in living organisms. This can happen as they take in contaminated air, water, food or contact with the skin. We are concerned about PBTs because they transfer easily among air, water and land and can be transported for long distances. PBTs are harmful to humans because they are known to cause damage to the nervous and reproductive systems. PBT exposure can pose a risk to developing fetuses or young children during critical growth periods when the brain, central nervous system, eyes and other organs are being developed. Most PBTs are man-made, but some PBTs have existed in nature and have only become a problem because of their increased use in man-made products, such as mercury.

Yes, Acrovyn 4000 is PBT-free.

2E. What is BPA, what is its environmental impact and is Acrovyn 4000 BPA-Free? BPA or Bisephenol A,[iv], a chemical, is a known endocrine disruptor. It serves many purposes, from lining the majority of our food cans, to being used in the manufacture of polycarbonate plastics. Heating polycarbonate containers has been found to cause residual BPA to leach out into food and/or liquid in that container. (That's why they tell you never to leave water bottles in a hot car, because BPA can leach out of the bottle into the water.) There is no BPA in Acrovyn 4000. BPA was a residual in Acrovyn 3000 from the manufacture of the polycarbonate portion of the blended compound, but because it was at residual levels and couldn't leach out, no danger was posed.

2F. Why not Acrovyn 3000? Although this was a PVC-free alternative, Acrovyn 3000 cost 15% more than original Acrovyn. When extruded, profiles featured a much higher gloss level that was unacceptable to many designers. And Acrovyn 3000's Pebblette texture didn't address the customers' concerns regarding cleanability. Although polycarbonate blends can be safely used in handrails and corner guards, a better alternative became available (Acrovyn 4000) sowe were able to move away from supporting the overall use of such materials.

3. Why did C/S choose the PETG compound for Acrovyn 4000? This compound offers the same impact protection and fire rating performance as original Acrovyn without PVC or PBTs. Highly extrudable/formable into almost any shape, PETG offers all of the qualities the sustainable market desires in an engineered plastic.

3A. What is the environmental Cradle to Grave impact of PETG? Because PETG does not contain PBTs, PVC, BPA or halogenated/brominated fire retardants[vii] it can be recycled and used to manufacture many products.

3B. Why did we not choose a bio-based product? There are significant practical, biological and ethical considerations surrounding the development of bio-based polymers. Standards continue to be refined. The most immediate and environmentally positive benefit of bio-based plastic is in the creation and use of biodegradable packaging and disposables. [vi] While the move towards more renewable bio-based products is appealing, some concern remains over how increased demand for these new compounds might affect other areas. Some have raised ethical concerns over converting precious food resources into non-food manufactured items. There are additional downstream agricultural affects concerning the active use of pesticides,

chemicals and genetic engineering practices. We believe these and other questions must be carefully considered against their claims and promises before we can determine their "true" sustainability. We believe additional time, research and discernment is necessary before the use of bio-polymers can be accepted as a socially, ethically and environmentally sound practice.

3C. Who's offering what material these days?

Competitor	Compound
Alpar (former Arden division)	Bio-Based
Construction Specialties	PETG
InPro	PVC, PC/ABS & PETG Bio-Blend
Korogard	PVC
Nystrom (formerly Arden)	PVC
Pawling (and WallGuard)	PVC
Tepromark (formerly Balco)	PVC

4. What makes Acrovyn 4000 better than InPro's PETG Bio-based material?

4A. Acrovyn 4000 is UL tested and labeled Class 1 Fire-rated. Although fire codes do not require wall protection to be UL tested and certified, C/S believes that a UL rating is the highest standard of fire testing. Acrovyn UL labels assure our customers that C/S will always provide the same quality product as the one that was originally tested. Our competition does not provide UL classified and labeled PETG products.

4B. Our Competitor's PETG product meets NFPA instead of UL. What's the difference? NFPA and other Code Authorities set building code standards, they do not certify products. UL sets standards and attests that products they certify always meet the performance standards. Having a UL label means that three different samples have all met the specified standard and that the products are included in a yearly follow up/audit program, ensuring that the company continues to provide the same quality product originally tested.

4C. The Acrovyn 4000 product line features Cradle to Cradle^{CM} Certified products. What does that mean? The Cradle to Cradle Production Innovation Institute^{SM} (the Institute) is a third party organization that evaluates and certifies a company's product and processes against the Cradle to Cradle^{CM} Product Standards. (Cited by many to be one of the most rigorous environmental standards.[vii]) The Institute has not just certified our base resin, but all our practices, processes and complete product down to its chemical constituents down to the level of 100 ppm. See model and color offerings for Cradle to Cradle ^{CM} certification level achieved.

The five key criteria that the Institute bases its certification on are:

1) Materials – The actual material composition identified and assessed down to the 100 parts per million level.
2) Material Reutilization/Design for Environment – The manufacturing process is evaluated and the recycling of the material is clearly defined (cradle to cradle).
3) Energy – Responsible energy consumption is evaluated.

4) Water – Responsible water consumption and conservation measures in place.
5) Social Responsibility – Fair employee compensation plan, community support program, etc., are all documented and reviewed.

4D. InPro states that their G2 Product is Cradle to Cradle Certified^{CM}, is this true? The raw resin, without any modifiers, colorants, etc., that goes into InPro's G2 product may be certified, but the G2 product is not Cradle to Cradle Certified^{CM}.

4E. What is GREENGUARD and what is the difference between Cradle to Cradle^{CM} and GREENGUARD certification? GREENGUARD only certifies that products meet the CA 01350 protocol for good indoor air quality, while Cradle to Cradle evaluates much more as stated above. Acrovyn 4000 meets CA 01350, and therefore achieves the protocol.

4F. Is there recycled content in Acrovyn 4000? C/S has not yet found a recycled material to use that maintains our environmental standards and produces a quality Acrovyn 4000 product. Our manufacturing scrap is being used for regrind retainers and gaskets.

4G. Is InPro's Material recyclable? Many questions and concerns have arisen as to the recyclability of bio-blends. Presently, there is no market for bio-blend waste streams.

5. Why a new texture?

5A. Why did C/S create a new texture for Acrovyn 4000? After consulting an extensive group of designers, architects and owners, we found that they overwhelmingly preferred a less aggressive texture over that of the original Acrovyn texture. The Pebblette texture had been the standard in the interior wall and door protection industry since the early 1970s. The end-user and architect market was ready for a newer, more modern texture that promised the additional benefits of being easier to clean while still hiding abrasions. The texture difference is similar to a color lot difference… as long as you are not butting Acrovyn 4000 next to original Acrovyn, this should not be an issue. (Show the samples to demonstrate the subtle difference.)

5B. Why do we have two textures for Acrovyn 4000? We wanted all Acrovyn products to have a contemporary appearance and to be easily cleaned. For wall covering, we selected the Suede texture because designers wanted Acrovyn wall covering to look like paint. For Acrovyn profiles we selected the Shadowgrain texture to provide a safe gripping surface on our handrails and to be substantial enough to hide abrasions on our wall guards, corner guards and handrails. An added benefit to changing Acrovyn's texture is our faux wood wall guards look even more realistic than ever before. And, the contrast in appearance between the patterned sheet and profiles is minimized.

5C. How will the new texture affect the housekeeping activities of end-users? Acrovyn 4000 will make maintenance easier because the less aggressive textures offer shallower pockets where dirt, scuff marks and bacteria can hide. Testing has also shown that Acrovyn

4000 resists the growth of bacteria and fungi. All told, we believe Acrovyn 4000 will outperform other products in the market without having to add chemicals.

5D. How will the new Acrovyn 4000 texture affect the appearance of our solid colors? The new texture will improve the appearance of our solid color products in several ways. The greatest impact will be an improvement in our color matching of Acrovyn profiles, in particular, the match between our end caps and the covers should be almost perfect. Since we've re-tooled the end caps and covers of all Acrovyn products, the texture between the end cap and profile should also match better than any competitive product.

6. How can C/S prove it is the leader in sustainable wall protection? C/S walks the talk. We are 1 of 2 Wall Protection Manufacturers to eliminate PVC. Not only do we offer multiple sustainable products, but our environmental stewardship has been recognized and/or certified on numerous occasions (PA Governor's Award for Environmental Excellence, 5th consecutive recipient of Practice Greenhealth's Champion for Change Award, Cradle to Cradle^{CM} Certification, etc.)

6A. Why one product offering? Years ago C/S's environmental initiatives spurred our pursuit to find a product comparable in performance to original Acrovyn, be PVC-free and still meet the market's performance and design needs. After extensive testing, Acrovyn 4000 has been proven to be the product of choice to eliminate PVC and to move forward with our environmental commitment.

6B. Why 14001 certification, and what does it do for us? ISO 14001 is the foremost international standard for responsible environmental management. C/S chose ISO 14001 as the umbrella under which it manages and audits its diverse and many environmental initiatives.

6C. How can C/S supply this environmental product at the same price? The PETG base resin is commonly used for eye-glasses, etc. so it is readily produced and available economically, and it's manufactured in the same way as our PVC material.

6D. Why is some of our production material sourced globally rather than locally? All the materials used for Acrovyn 4000 fully comply with our highest standards for purity, quality and sustainability. As a global supplier, C/S continually monitors and evaluates the best practices in sustainable product development. Our global presence allows us to acquire knowledge and make responsible decisions for our supply chain based upon all the available resources and technologies. Since our products are manufactured in the US, C/S thoroughly evaluates its global suppliers and uses its influence to encourage each of them to seek ISO 14001 certification. Even though a few raw materials are globally sourced, as defined in the Buy American Act, Acrovyn 4000 is made in the US.

6E. How does Acrovyn 4000 benefit the architect? Acrovyn 4000 offers improved aesthetic options and is a sustainable product offering that can help contribute to LEED® certification. The new contemporary texture improves cap to cover match, as well as enhances the Chameleon wall guard offering.

6F. How does Acrovyn 4000 benefit the end user? Acrovyn 4000 is a sustainable product featuring an updated texture. The improved texture is easier and less expensive to clean . . . a clean environment generally results in a safer, healthier environment. Acrovyn 4000 can also help contribute to a LEED® certified building.

6G. What is the difference in cost? None. Acrovyn 4000 is the same price as standard Acrovyn.

7. Where are we headed? Are we looking at bio-based products for future generations of Acrovyn? Yes. C/S continues to review the evolution of bio-based compounds for potential use in future generations of Acrovyn. Our move towards bio-based materials will be dependent upon the satisfaction of our requirements that these newer products meet the practical, biological and ethical standards held by the design/build community and the oversight groups who monitor and certify their composition. Until then, we will continue to use only those raw materials that have been sourced responsibly while meeting the strictest definitions of being truly "eco friendly" without compromise.

GLOSSARY – Acrovyn 4000 Related Terminology

Bio-Based – An engineering material, chemical or energy made from substances derived from living matter and that are often biodegradable.

Bio-Blend – A compound combining one material not derived from living matter with another material that is derived from living matter. It's nearly impossible to separate the blended materials for proper recycling. (InPro's G2.)

BPA (Bisophenol-A) – An organic compound that is actually a dysfunctional building block for several important plastics and plastic additives. It is known to be an endocrine disruptor that could possess significant health hazards when introduced into our food and water. (Remember the baby bottle and water bottle concern.)

Cradle to Cradle (C2C) – Products and services designed based on patterns found in nature, eliminating the concept of waste entirely and creating an abundance that's healthy and sustaining. It's the idea that at the end of life, any product can be turned into something else to close the cycle so that ultimately there is no waste. (Manufacture, use and recycle…Acrovyn 4000 sheet and profiles are C2C Certified^{CM}.)

Cradle to Cradle Products Innovation Institute – (the Institute) – In 2010, MBDC gifted its environmental quality standard to the Institute which is now the 3rd party organization that certifies products based on the Cradle to Cradle^{CM} Standards five key criteria.

Cradle to Grave – A full life cycle assessment from manufacture (cradle) through use phase to disposal phase (grave). It's a typical system of design where at the end of its useful life a product becomes waste.

Dioxin – The name generally given to a class of super-toxic chemicals. Chlorinated dioxins and furans are formed as by-products of the manufacture, molding or burning of organic chemicals and plastics that contain chlorine. It is the nastiest, most toxic man-made organic chemical; its toxicity is second only to radioactive waste.

Dioxin-Former – An unstable compound that through a chemical reaction produces environmental pollutants or dioxins. (i.e.: the manufacture of chlorinated organics, the burning of Chlorine in PVC, backyard burning of household trash, etc)

Endocrine Disruptor – A hormonally active agent, this substance acts like a hormone in the endocrine system and disrupts the physiological function of hormones. (i.e.: BPA)

GREENGUARD – A 3rd party organization that certifies products in accordance to CA 01350 good indoor air quality standard.

ISO 14001 – The International Standards Organization's environmental management certification based on a thorough review of our manufacturing processes and their impacts on the environment. (C/S Hughesville and InPro are both ISO 140001 Certified.)

ISO 9001:2000 – The International Standards Organization's quality management certification based on an organization's processes and procedures. (C/S Hughesville and InPro are both ISO 9001:2000 Certified.)

MBDC (McDonough Braungart Design Chemistry) – MBDC gifted its environmental quality standard to the non-profit Cradle to Cradle Product Innovation Institute (the Institute) in 2010. Today MBDC is an accredited assessor for the Institute's 3rd party certification.

NFPA (National Fire Protection Association) – A US organization (with some international members) charged with creating and maintaining minimum standards and requirements for fire prevention and other life-safety codes and standards. They do not certify product fire ratings.

Off-Gassing – The evaporation of volatile chemicals in non-metallic materials at normal atmospheric pressure, meaning that years after installation of certain products occupants continue to breathe in these chemicals.

PBT (Persistent Bioaccumulative Toxin) – Pollutant chemicals that are toxic, persist in the environment, bioaccumulate in food chains and pose risk to human health and ecosystems. (Three of the most common are lead, mercury and dioxins.) They transfer easily between air, water and land, span generations and boundaries and do not break down or become as diluted as non-PBTs do.

PC/ABS (Polycarbonate / Acrylonitrile Butadiene Styrene) – A plastic blend that is stronger plastic than the two compounds by themselves (Acrovyn 3000 and InPro's 1st PVC-free offering).

PETG (Polyethylene Terephthalate Glycol), pronounced P-E-T-G (*not* Pet-G) **–** A PVC/PBT-free thermoplastic (engineered polyester) that modifies a traditional polymer previously not suited for engineered architectural shapes, including Acrovyn profiles. (Acrovyn 4000; InPro's new G2 is a blend of PETG & bio-based.) PETG is also used for blister packs, packaging and food storage containers.

Polymer – A large molecule composed of repeating structural units typically connected by covalent chemical bonds. Popular usage often suggests plastic, but the term actually refers to a large class of natural synthetic materials with a wide variety of properties (i.e.: DNA).

Post-Consumer – The most heavily practiced form of recycling where the materials being recycled have already passed through the consumer market and are recycled and/or reconstituted into a product for the consumer market once again.

Pre-Consumer – When the materials do not reach the intended use or consumer and are either discarded or recycled. Recycled materials can be broken down and remade into similar or different materials, or sold to third party buyers to utilize for consumer products.

PVC (Polyvinyl Chloride) – A thermoplastic polymer that has become widely used in the construction industry because it's cheap, durable and easy to assemble (original Acrovyn and what almost of our competitors still sell).

Thermoplastic – A polymer that at an increased temperature can be formed or extruded to take on other shapes (i.e.: handrail).

UL (Underwriters Laboratories) – An independent product safety certification organization that develops standards and test procedures for products, materials, etc. and conducts periodic, unannounced follow-up inspections at manufacturers' locations to ensure ongoing compliance to the standards UL certified their products meet.

VOCs (Volatile Organic Compounds) – Organic chemical compounds that have significant vapor pressures and which can affect the environment and human health.

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[i] Healthy Building Network, Practice Greenhealth, Green Guide for Healthcare, Greenpeace http://archive.greenpeace.org/toxics/pvcdatabase/bad.html

[ii] Designing the 21st Century Hospital, http://www.healthdesign.org/research/reports/GreenPapers.php

[iii] http://www.epa.gov/opptintr/pbt/pubs/cheminfo.htm http://www.healthybuilding.net/news/rtknow-051905.html

[iv] http://www.besafenet.com/pvc//documents/pvc_and_pbt_policies.pdf

[v] http://www.usgbc.org/ShowFile.aspx?DocumentID=6331

[vi] http://bulletin.aarp.org/yourhealth/policy/articles/what_is_in_your_bottle.html?CMP=KNC-360I-GOOGLE-BULL&HBX_OU=50&HBX_PK=bpa&utm_source=Google&utm_medium=CPC&utm_term=bpa&utm_campaign=G-Your%2BHealth%2B-%2BArticles

[vii] http://www.halogen-free.org/index.htm

[viii] http://www.smithsonianmag.com/science-nature/plastic.html#ixzz0kofu4HlZ

[ix] http://construction.com/CE/articles/0711edit-4.asp