

Noroc®

LEED® Canada-NC v1.1 & CS v1.0

Norbec Architectural®: **INNOVATING AND OFFERING VALUE-ADDED SOLUTIONS TO IT'S CUSTOMER'S NEEDS**

Norbec Architectural was created in 1999 under the name of Norlam. The company began by making prefabricated architectural panels with expanded polystyrene core, on which the galvanized steel is flattened. It was then an innovative solution for the shell of buildings (ships).

Indeed, NORLAM's panels offered an enhanced look, quick installation and a high energy efficiency compared to a traditional wall of corrugated metal and insulating wool.

After many growing years, the company bought a state-of-the-art unit of production which allowed to produce panel with polyisocyanurate core (polyurethane) or mineral fiber core. All located in a building exclusively designed for this purpose. Norrex and Noroc products were born.

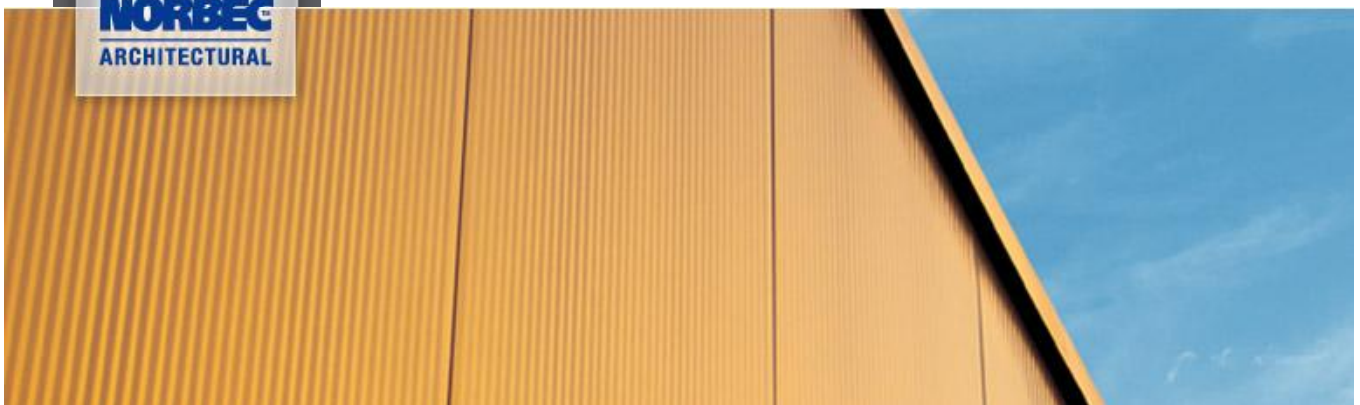
As an economic and innovative alternative, NORSERIES provides high-performance custom responses that far outstrip conventional construction methods.

Norlam : Panel with expanded polystyrene core, versatile and offering an unrivalled price-quality ratio.

Norex : Most advanced and high-performance panel with polyisocyanurate core (polyurethane) which responds to more specific needs.

Noroc : Panel with mineral fiber core which blends exceptional fire-resistance properties with cutting-edge innovations.

***Norbec Architectural** is still growing by expanding his market every day and innovating persistently, always keeping his quality standards very high. Norbec's products contribute to the obtention of LEED®'s credit and **Norbec Architectural** is proud to participate in the conception of green buildings leading to a reduction of energy consumption. With your needs in mind, the Norbec Group is committed to providing you with unparalleled solutions through our ongoing program of research and development.*



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PANEL WITH MINERAL FIBER CORE

A pioneer product on the North American market, Noroc® blends exceptional fire-resistance properties with cutting-edge innovations.

Noroc® fits easily in with Norex® products in the series when a high-performance fire wall is needed.

NOROC® ADVANTAGES

- ✓ Harmonization with Norex® and Norlam® products
- ✓ Enhanced sound insulation
- ✓ Stable thermal resistance over time
- ✓ Outstanding firewall protection :1 h to 2 h
- ✓ Integrated pressure-equalized rainscreen
- ✓ Exclusive structural anchoring system
- ✓ Elimination of thermal bridges
- ✓ Enhanced resistance to wind and tear-out
- ✓ Higher thermal value per inch
- ✓ Lower installation time and costs
- ✓ Insulation and finish : no additional steps

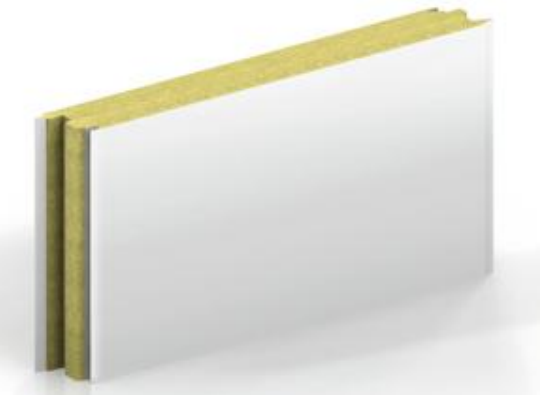
Basic uses/Related uses

- Architectural fire-rated, composite panel designed for the construction of exterior building walls and interior partitions.
- For use in a wide variety of applications, including fire rated walls for industrial and commercial buildings, cold-storage buildings, sports centers, sanitary requirements and acoustical requirements.



PRODUCTS | NORSERIES | NOROC®

PANEL WITH MINERAL FIBER CORE



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A positive impact with LEED® Canada NC v1.1 & CS v1.0

With a growing demand for sustainability in the design and operation of buildings from all key stakeholders in North America, the Leadership in Energy and Environmental Design (**LEED**) green building rating system is helping building owners and industry professionals walk the talk.

The following product data outlines **the potential contribution of NORBEC products** for credit achievement under the **LEED Canada-NC v1.1** (New Construction and Major Renovations) that is part of an evaluation system family for different construction project types and is based on 70 points in six credit categories.

The following document also outlines the potential contribution of **NORBEC** products for credit achievement under the **LEED Canada-CS** (Core & Shell) which is derived from the **LEED Canada-NC** system and applies to buildings where less than 50% of the building area will be fit-up to **LEED Canada-NC** requirements prior to certification.

The **LEED Canada-CS** certification is currently possible under the *Application Guide for Core and Shell Buildings and Leased Tenant Spaces* which not only provides the necessary details for the **LEED Canada-CS** certification but also flexibility and direction to the **LEED Canada-NC** projects which have leased tenant spaces. **LEED Canada-CS** incorporates the building envelope and site, and assumes that the tenants are responsible for the building fit out, while **LEED Canada-NC** incorporates the whole building project.

In all cases, LEED certifies building *projects*, not products. Furthermore, a sole product cannot qualify a project under the LEED® system; the requirements apply on the whole building.

Summary of the LEED® Canada-NC v1.1 & CS v1.0					NOROC®
Categories		Prerequisite	Credits	Points	Potential Contribution
SS	Sustainable Sites	1	8	14	0 points
WE	Water Efficiency	0	3	5	0 points
EA	Energy and Atmosphere	3	6	17	1-10 points
MR	Materials and Ressources	1	8	14	9 points
IEQ	Indoor Environmental Quality	2	8	15	3 points
ID	Innovation and Design	0	2	5	2 points
Total		7	35	70	Up to 24 points

The use of this product may contribute to earn points for the LEED® credits mentioned above. However, since it is the building that gets certified and not its components, they cannot guarantee the building certification.

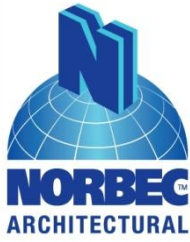
Noroc®
LEED® Canada-NC v1.1 & CS v1.0



Summary of NOROC Panels Contribution to LEED® Canada-NC v1.1 & CS v1.0

Credits	Durable strategies	Potential points	Credit relevance	Credit requirements	Contribution and compliance of NOROC Panels
Energy and Atmosphere (EA)					
EA p2	Minimum Energy Performance	0 (prerequisite)	Direct	<p>New Buildings & Major Renovations to Existing Buildings</p> <p>Option 1- Reduce the design energy consumption to comply with Natural Resources Canada's Commercial Building Incentive Program (CBIP) requirement for a 25% reduction relative to the consumption of the reference building designed to the Model National Energy Code for Buildings 1997 (MNECB)</p> <p>OR</p> <p>Reduce the design energy cost by 18% relative to the reference building designed to ASHRAE/IESNA 90.1-1999</p> <p>Option 2- Reduce the design energy consumption by 10% relative to the consumption of the reference building designed to the CBIP adaptation of the MNECB.</p>	<p>The Noroc architectural panels from Norbec Architectural contribute to this prerequisite with their R factor depending on their thickness of 4, 5 or 6 inches.</p> <p>For the mineral wool fibre insulation R factor varies between R16 and R24 (depending on the specifications).</p> <p>The Noroc panels offer good air tightness and eliminate thermal bridges within the wall, which could optimise the overall building energetic performance.</p>
EA c1	Optimize Energy Performance	1 to 10 points (depending on the energetic performance of the building)	Direct	<p>New Buildings & Major Renovations to Existing Buildings</p> <p>Reduce design energy cost compared to the energy cost of the MNECB OR ASHRAE/IESNA 90.1-1999 reference building for energy systems regulated by these standards.</p> <p>One point is earned for a 24% reduction (new buildings) or 15% reduction (existing buildings) under the MNECB standard, and 15% reduction (new buildings) or 5% reduction (existing buildings) under the ASHRAE 90.1.1999 standard and up to 10 points.</p>	<p>The Noroc architectural panels from Norbec Architectural contribute to this prerequisite with their R factor depending on their thickness of 4, 5 or 6 inches.</p> <p>For the mineral wool fibre insulation R factor varies between R16 and R24 (depending on the specifications).</p> <p>The Noroc panels offer good air tightness and eliminate thermal bridges within the wall, which could optimise the overall building energetic performance.</p>
Materials & Ressources (MR)					
MR c2.1	Construction Waste Management	1	Indirect	<p>Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.</p>	<p>The use of prefabricated Norbec Architectural panels helps minimising construction waste and can therefore contribute to this credit.</p> <p>A pallet refund policy has been established by Norbec Architectural in order to cut construction waste.</p> <p>A return slip is issued with the number of inbound and outbound pallets and their corresponding weight.</p>

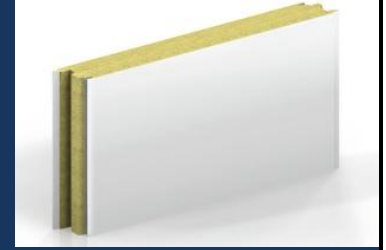
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LEED® Canada-NC v1.1 & CS v1.0



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Credits	Durable strategies	Potential points	Credit relevance	Credit requirements	Contribution and compliance of NOROC Panels
MRc2.2	Construction Waste Management	1	Indirect	Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 75% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.	The use of prefabricated Norbec Architectural panels helps minimising construction waste and can therefore contribute to this credit. A pallet refund policy has been established by Norbec Architectural in order to cut construction waste. A return slip is issued with the number of inbound and outbound pallets and their corresponding weight.
MRc3.1	Resource Reuse 5%	1	Direct	Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of the total cost of building materials.	The Noroc architectural panels can only contribute to this credit when they are recycled or reused in another project or when they are used for another purpose in the same project. When the products are new they don't contribute to this credit.
MRc3.2	Resource Reuse 10%	1	Direct	Use salvaged, refurbished or reused materials, products and furnishings for at least 10% of the total cost of building materials.	The Noroc architectural panels can only contribute to this credit when they are recycled or reused in another project or when they are used for another purpose in the same project. When the products are new they don't contribute to this credit.
MRc4.1	Recycled Content 7.5%	1	Direct	Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 7.5% of the total value of the materials in the project. (Divisions 2 to 10 of the Master Format)	The Noroc architectural panels can contribute to this credit. Depending on the wall thickness, the steel type or the insulation type, the pre-consumer recycled content will vary between 26.23% and 26.53% , and the post-consumer content will vary between 1.24% and 7.72% . Therefore, up to 21% of the Noroc panels costs can be applied to a project aiming at credit MRc4.1 for recycled content (7.5%) All data pertaining to the Noroc panels components have been reviewed by a third party – Vertima . Norbec Architectural can therefore provide all necessary information for a LEED® project.

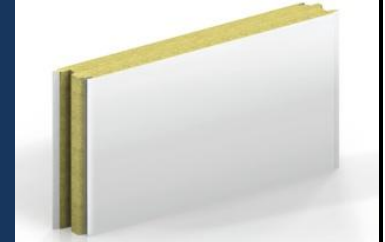
Noroc®
LEED® Canada-NC v1.1 & CS v1.0



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Credits	Durable strategies	Potential points	Credit relevance	Credit requirements	Contribution and compliance of NOROC Panels
MRc4.2	Recycled Content 15%	1	Direct	Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 15% of the total value of the materials in the project. (Divisions 2 to 10 of the Master Format)	The Noroc architectural panels can contribute to this credit. Depending on the wall thickness, the steel type or the insulation type, the pre-consumer recycled content will vary between 26.23% and 26.53% , and the post-consumer content will vary between 1.24% and 7.72% . Therefore, up to 21% of the Noroc panels costs can be applied to a project aiming at credit MRc4.2 for recycled content (15%) All data pertaining to the Noroc panels components have been reviewed by a third party – Vertima . Norbec Architectural can therefore provide all necessary information for a LEED® project.
MRc5.1	Regional Materials 10%	1	Direct	Use a minimum of 10% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km (500 miles) of the project site if shipped by road or 2400 km (1,500 miles) of the project site, and shipped by rail or water OR Use a minimum of 10% of building materials or products that reflect a combination of the above extraction, processing, manufacturing and shipping criteria.	The Noroc architectural panels components for which the extraction and manufacturing sites are within the prescribed radius can contribute to this credit. The Noroc panels are manufactured in Ste-Hyacinthe, Québec (J2S 8A2) . The main component's origin as well as their transportation mode can be validated for each project . All data pertaining to the Noroc panels components have been reviewed by a third party – Vertima . Norbec Architectural can therefore provide all necessary information for a LEED® project.
MRc5.2	Regional Materials 20%	1	Direct	Use a minimum of 20% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km (500 miles) of the project site if shipped by road or 2400 km (1,500 miles) of the project site, and shipped by rail or water. OR, Use a minimum of 20% of building materials or products that reflect a combination of the above extraction, processing, manufacturing and shipping criteria.	The Noroc architectural panels components for which the extraction and manufacturing sites are within the prescribed radius can contribute to this credit. The Noroc panels are manufactured in Ste-Hyacinthe, Québec (J2S 8A2) . The main component's origin as well as their transportation mode can be validated for each project . All data pertaining to the Noroc panels components have been reviewed by a third party – Vertima . Norbec Architectural can therefore provide all necessary information for a LEED® project.

Noroc®
LEED® Canada-NC v1.1 & CS v1.0



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Credits	Durable strategies	Potential points	Credit relevance	Credit requirements	Contribution and compliance of NOROC Panels																								
MRC8	Durable Building	1	Direct	Develop and implement a Building Durability Plan, in accordance with the principles in CSA S478-95 (R2001) – <i>Guideline on Durability in Buildings</i> , for the components within the scope of the Guideline, for the construction and preoccupancy phases of the building.	<p>The Noroc architectural panels can contribute to this credit depending on the project design in compliance with the Guideline on Durability in Buildings, CSA S478-95.</p> <p>The Noroc panels help reducing the wall degradation with its rain screen, ist air and water tightness and its high insulation value.</p> <p>Norbec Architectural offers a 5 years warantee against any fabrication defects. The expected lifespan of Norbec products is around 40 years.</p> <p>The Noroc panels can be partially desinstalled and reinstalled for reparation wich optimizes the walls lifespan.</p>																								
Indoor Environmental Quality (IEQ)																													
IEQc3.2	Construction Indoor Air Quality Management Plan – Before Occupancy	1	Indirect	Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase that follows one of the three options below: 1. Building Flush Prior to Occupancy 2. Building Flush Overlapping with Occupancy 3. IAQ Testing Prior to Occupancy	<p>The Noroc architectural panels indirectly contribute to this credit if option 3 is used in the project.</p> <p>Since the Noroc panels can be used as interior partitions, they could be a source of interior air pollution.</p> <p>They are factory manufactured but their installation on the job site can require adhesives and sealants that can comply with the prescribed VOC content. (see credit IEQ4.1 Compliance)</p>																								
IEQc4.1	Low-Emitting Materials: Adhesives and Sealants	1	Direct	The VOC content of adhesives, sealants and sealant primers used must be less than the VOC content limits of the State of California’s South Coast Air Quality Management District (SCAQMD) Rule #1168 , October 2003.	<p>The Noroc architectural panels can contribute to this credit since they are sometimes used as interior partitions.</p> <p>The Noroc panel installation on the job site can require adhesives and sealants that can comply with the prescribed VOC content of this credit.</p> <p>List of adhesives and sealants applied on the job site and their VOC content:</p> <table><tr><td>Adfast:</td><td>Adfoam 1885-2</td><td>sealant</td><td>5 g/l</td></tr><tr><td></td><td>Adseal 4550</td><td>sealant</td><td>49 g/l</td></tr><tr><td></td><td>Adsil 4800</td><td>sealant</td><td>48 g/l</td></tr><tr><td></td><td>Adbond8- 400*</td><td>adhesive</td><td>389 g/l</td></tr><tr><td></td><td>Adbond 1920</td><td>adhesive</td><td>18 g/l</td></tr><tr><td></td><td>Adbond 1921</td><td>adhesive</td><td>18 g/l</td></tr></table> <p>*off-specification</p>	Adfast:	Adfoam 1885-2	sealant	5 g/l		Adseal 4550	sealant	49 g/l		Adsil 4800	sealant	48 g/l		Adbond8- 400*	adhesive	389 g/l		Adbond 1920	adhesive	18 g/l		Adbond 1921	adhesive	18 g/l
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IEQc4.2	Low-Emitting Materials: Paints & Coatings	0 non-applicable	Indirect	Interior paints and coatings must not exceed the VOC and chemical component limits of Green Seal's Standard GS-11 and GC-03 . The VOC content of all primers, under-coatings, sealers and clear wood finishes used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1113 .	The finishing of Norbec Architectural products is done at the factory. Since this credit only applies to paints and coatings applied on the job site , they don't qualify for this credit.
IEQc7.1	Thermal Comfort	1	Indirect	Comply with the ASHRAE 55-2004 , Thermal Comfort Conditions for Human Occupancy standard.	There is a synergy between the use of Noroc architectural panels and this credit. They contribute to the building energy conservation strategy thanks to their air tightness. This compliance must be validated with engineering calculation for the whole building according to psychometric charts.

Innovation in Design (ID)

IDc1.1	Innovation in Design	1	Direct	Exemplary Performance : Optimize Energy Performance Exemplary Performance for EAc1 : Optimize the energetic performance to 65% under the ASHRAE 90.1.1999 standard for new construction.	The Noroc architectural panels have an insulation value of up to R24 depending on the selected wall thickness. They also offer superior air tightness and eliminate thermal bridges. These elements could help optimising the energetic performance of the building depending on its design.
IDc1.2	Innovation in Design	1	Indirect	Exemplary Performance : Construction Waste Management Exemplary Performance for MRc2 : Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 95% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.	The use of prefabricated Noroc architectural panels helps minimising construction waste and can therefore contribute to this type of exemplary performance. The design team could think of including this right from the start. A pallet refund policy has been established by Norbec Architectural in order to cut construction waste. A return slip is issued with the number of inbound and outbound pallets and their corresponding weight.
Total		Up to 24 points	Noroc Panels can contribute up to a total of 24 potential points for a LEED® Canada-NC and CS project.		

All NORBEC Architectural's documents required for the LEED certification are available. They were written by Vertima, LEED® certification specialists providing you with comprehensive and reliable information.