PO Box 656
3607 Atwood Road
Stone Ridge, NY 12484
www.pk30system.com

T. 845.687.9774
T. 212.473.8050
F. 888.653.1394

LEED Compliance Documentation

All of the LEED Certification research and documentation available here has been prepared by Environmental Building Strategies in collaboration with PK-30 System. We thank Environmental Building Strategies for their knowledge and expertise.

Overview

From the USGBC:
"LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts."

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

"LEED is flexible enough to apply to all building types – commercial as well as residential. It works throughout the building lifecycle – design and construction, operations and maintenance, tenant fit out, and significant retrofit."

LEED is broken up into a number of rating systems. This report will focus on the four rating systems that most directly apply to projects that will use PK30 System's products.

Under the auspice of the LEED for Interior, Design and Construction (ID&C) Reference Guide:

1. LEED for Commercial Interiors is focused on tenant improvement projects in existing buildings.

Under the auspice of the LEED for Building, Design and Construction (BD&C) Reference Guide:

2. LEED for New Construction evaluates new construction projects or major renovation projects.
3. LEED for Schools is the rating system focused specifically on the new construction or major renovation of schools.
4. LEED for Core and Shell is focused on speculative core and shell building projects.

Each of these rating systems is subsequently broken up into 5 credit categories:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality

There are also two areas categories where bonus credits exist:

- Innovation in Design: This category evaluates strategies utilized by project teams that go above and beyond the credit requirements or are innovative beyond the scope of the rating system.

- Regional Priority: This category contains region specific credits for which projects can earn an extra point.

PK30 System's products help projects achieve points in several of the 5 credit categories and relate specifically to six credits, which are listed below. Beyond these credit categories, PK30 System's products will help a project potentially earn points in the two bonus categories.

*All information is regarding LEED Version 3

Recycled Content

- LEED for Commercial Interiors (CI) MR Credit 4
- LEED for New Construction (NC) MR Credit 4
- LEED for Core and Shell (CS) MR Credit 4
- LEED for Schools (Schools) MR Credit 4

Requirements

Use materials, including furniture and furnishings, with recycled content such that the sum of Post-consumer recycled content plus 1/2 of the Pre-consumer content constitutes at least 10% or 20% based on cost of the total value of the materials in the project. The minimum percentage materials recycled for each point threshold is as follows:

Recycled Content	Points
10%	1
20%	2

The recycled content value of a material or furnishing is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of the assembly to determine the recycled content value. Mechanical, electrical and plumbing components cannot be included in this calculation.

PK30 System Products Contribution:

Recycled Content						
Material	Manufacturer	Weight of Material (lbs)	Weight of Post Consumer Recycled Content (lbs)	Post Consumer Recycled Content (percent)	Weight of Preconsumer/Post Industrial Recycled Content (lbs)	Pre Consumer/Post Industrial Recycled Content (percent)
PK30 System's proprietary extruded aluminum profiles	Keymark Corporation	45.60	10.03	22%	18.24	40%
Lumicor Acrylic	Lumicor	212.62	0.00	0%	85.05	40%
Hawa track and running gear	Hawa	0.00	0.00	10%	0.00	0%
Hinges	Hager	0.00	0.00	55%	0.00	12%
5			0.00		0.00	
6			0.00		0.00	
7			0.00		0.00	
8			0.00		0.00	
Totals:		258.22	10.03		103.29	
Percentage Reycled Content According to LEED						23.89%

Figure 1 - Recycled Content Example Calculation

Figure 1 above shows the recycled content of an example PK30 System partition. The calculator is designed so the user can input the exact dimensions and materials of their specific partition solution and it will calculate the recycled content. One can expect the minimum recycled content to be around 10% with some partition's recycled content reaching upwards of 30%. The PK30 System's staff will work with project teams to design a partition with the highest possible recycled content. The calculator is downloadable from the PK30 System site: http://www.pk30.com

Regional Credit

- **LEED for Commercial Interiors MR Credit 5**

Requirements

Option 1 (1 point)
Use a minimum of 20% of the combined value of construction and Division 12 (Furniture) materials and products that are manufactured regionally within a radius of 500 miles of the point of manufacture.

Option 2 (2 points)
Meet the requirements for Option 1.
Use a minimum of 10% of the combined value of construction and Division 12 (furniture) materials and products extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.

Calculations

Materials costs include all expenses to deliver the materials to the project site. Materials costs should account for all taxes and transportation costs incurred by the contractor but exclude any cost for labor and equipment once the material has been delivered to the site.
For assemblies or products manufactured within the 500-mile radius that contain some components extracted farther away, use multiple lines when listing purchases. Base the proportionality of such products' costs on the weight of their various components.
The destination where an assembly is constructed is considered the point of manufacture.

- **LEED for BD&C (includes LEED for NC, LEED for CS, and LEED for Schools) Credit MR 5**

Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total materials value. If only a fraction of a product or material is extracted, harvested or recovered and manufactured locally, then only that percentage (by weight) must contribute to the regional value. The minimum percentage regional material for each point threshold is as follows:

Regional Content	Points
10%	1
20%	2

PK30 System Products Contribution:

The following pertains to LEED for Commercial Interiors Option 2 and BD&C entire credit - Extracted, harvested, or recovered as well as manufactured regionally:

As PK30 System receives materials from all over the US and from Switzerland only a part of their product will qualify for Option 2 of the LEED for Commercial Interiors credit or the BD&C credits. The requirements mandate that the raw materials of products must be extracted, harvested or recovered, as well as manufactured, within 500 miles of the project. Below is a calculator that shows an example of a PK30 System's partition and how much of it will qualify for these points. This calculator is designed to allow a user to input the exact dimensions and materials used in their partition, which it will use to calculate the exact contribution of the partition to the above credits.

The calculator is downloadable from the PK30 System site: http://www.pk30.com

Regional Material Calculator MRc 5.1 & 5.2								
MRc 5.2							MRc5.1	
Material	Manufacturer	Weight of Material	Percentage of Material that is compliant	Location of Extraction, Harvesting, or Recovery	Is the Location of Extraction, Harvesting or Recovery Within 500 Miles of the Project?	Weight Contributing to MRc 5.2 Regional Material	Is the point of final manufacture (Stone Ridge, NY) Within 500 Miles of the Project?	Weight Contributing to MRc 5.1 Regional Material
PK30 System's proprietary extruded aluminum profiles	Keymark Corporation	74.70	62%	Fonda, NY	Yes	46.31	Yes	74.70
Walker Tinted Glass	Walker Glass	429.58	100%	Carlisle, PA	Yes	429.58	Yes	429.58
Hawa track and running gear	Hawa	10.00	0%	Switzerland	No	0.00	Yes	10.00
Hinges	Hager	15.00	0%	Alabama	No	0.00	Yes	15.00
5								
6								
7								
8								
Totals:		529.28			Total Contributing Weight:	475.89	Total Contributing Weight:	529.28
MRc 5.2 Regional Content Percentage:						90%	MRc 5.1 Regional Conent Percentage:	100%

Figure 2: Regional Material Example Calculation

Assemblies calculate their compliance with this credit based on weight. Each raw material that goes into making the product must have its location of sourcing listed and the materials whose source locations are within 500 miles of a project site will have their weight contribute to this credit/option. The final regional material calculation is done by cost, with the final percentage of compliant materials multiplied by the total cost of the product to generate a compliant cost of the assembly.

COST OF REGIONAL MATERIAL = PERCENTAGE OF LOCAL MATERIAL (BY WEIGHT) * TOTAL COST OF PRODUCT

Equation: 1

At least 62% of the PK30 Aluminum Extrusions as manufactured by Keymark Corporation will qualify for being extracted, harvested, or recovered regionally. Additionally, depending on what type of Walker Glass or wood is specified, both materials could be sourced regionally. The information provided in the calculator above shows one scenario for a PK30 System partition. Depending on material selection, the size and dimensions of your partitions, and the location of your project, results will vary.

Note: This calculator does not guarantee a project will get a percentage of points for implementing PK30 System's products as it depends on the location of the project. It lists the materials that could possibly qualify for this credit.

Figure 3 below is a map of the area where projects must be located in order to qualify for this credit. To have PK30 System's partitions contribute as highly as the scenario shown in the calculator, your project must be located within the intersection of the blue, red and green circles. In order for PK30 System's partitions to contribute at all to this option/credit, your project must be located in the intersection of the blue, and either the green or red circles.

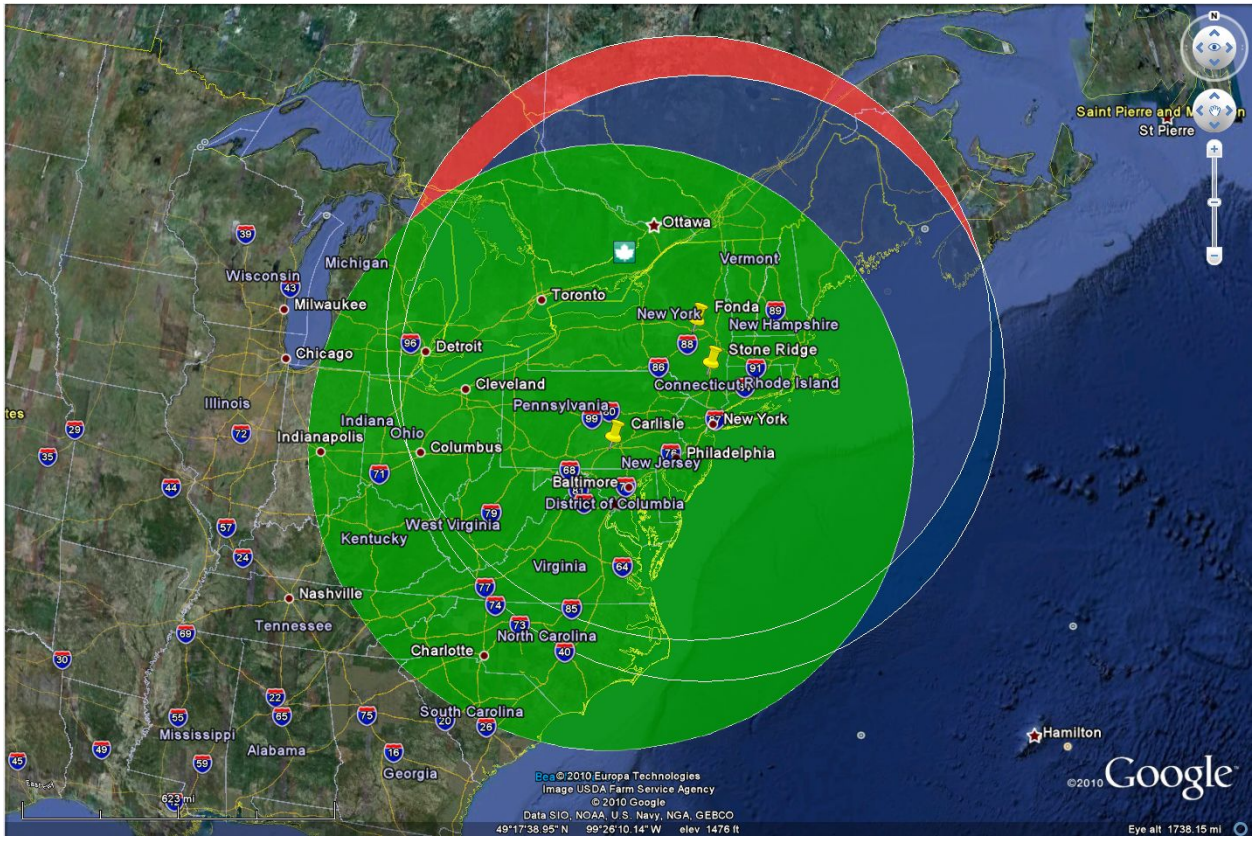

Figure 3: Overlapping 500 mile Radii of Manufacturing and Extraction points

- Blue = PK30 System Manufacturing Point (Stone Ridge, NY)
- Red = PK30 Aluminum Extrusions as manufactured by Keymark Corporation (Fonda, NY)
- Green = Walker Tinted Glass (Carlisle, PA)

- **LEED for Commercial Interiors Credit MR 5**

Requirements

Option 1 (1 point)

Use a minimum of 20% of the combined value of construction and Division 12 (Furniture) materials and products that are manufactured regionally within a radius of 500 miles.

PK30 System Products Contribution:

For this option in LEED for Commercial Interiors, the manufacturing point is the location that is important. According to LEED: "The point of manufacture is considered the place of final assembly of components into the building product that is furnished and installed by the trades workers. For example, if the hardware comes from Dallas, the lumber comes from Vancouver, and the joist is assembled in Kent, Washington, then the location of the final assembly is Kent, Washington."

Below is a map that shows the areas within a 500-mile radius of Stone Ridge, New York, the location of manufacturing.

Figure 4: 500-mile Radius From Manufacturing Point

For any project located in this region PK30 System's products will fully contribute to Option 1 of LEED for Commercial Interiors Credit MR 5.

Acoustical Performance

From LEED:

- IEQ Credit 9 for New Construction Schools: Enhanced Acoustical Performance

Requirements:

Sound Transmission

Design the building shell, classroom partitions and other core learning space partitions to meet the Sound Transmission Class (STC) requirements of ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools, except windows, which must meet an STC rating of at least 35.

AND

Background Noise

Reduce background noise level to 40dBA or less from heating, ventilating, and air conditioning (HVAC) systems in classrooms and other core learning spaces.

Below are two tables from ANSI Standard S12.60-2002, which describe the minimum STC measurements, required for this credit.

Adjacent Space Type	Minimum STC Rating
Other Classrooms	50
Outdoors	50
Bathrooms	53
Corridor	45
Offices, Conference Rooms	45
Music Rooms	60
Mechanical Equipment Room	60
Cafeteria, Gym, Natatorium	60

Table 1. STC Requirements for Core Class Room Assemblies from ANSI Standard S12.60-2002

Receiving ancillary Learning space	Corridor, staircase, common use and public use toilet and bathing room	Music room	Office or Conference Room	Outdoors	Mechanical Equipment room, cafeteria, gymnasium or indoor swimming pool
Corridor	45	60	45	45	55
Music Room	60	60	60	45	60
Office or Conference Room	45	60	45	45	60

Table 2. Minimum STC ratings recommended for single or composite wall, floor-ceiling and roof-ceiling assemblies separating an ancillary space from an adjacent space from ANSI Standard S12.60-2002

Other requirements:

- Entry doors into classrooms and other core learning spaces: STC 30

Definitions:
Sound Transmission Class (STC): is a single number rating for the acoustic attenuation (reduction) of airborne sound passing through a partition or any other building element such as a wall, roof or door as measured in an acoustical testing laboratory following accepted industry practice. A higher STC rating provides more sound attenuation through a partition.

PK30 System Products Contribution:

Upon request, a laminated 1/2-inch thick panel can be used in the partition coupled with a translucent interlayer for sound attenuation to reach minimum STC levels and meet this credit's requirements. Please consult with an acoustical engineer for help designing your partition solutions to meet the requirements.

Beyond LEED, sound attenuation is an important performance aspect of any partition. It decreases the influence of outside noise on a space and its occupants increasing worker, or student production and attention.

Daylight and Views

From LEED:

- LEED IEQ Credit 8.2 (for both LEED for Commercial Interiors and the LEED BD&C rating systems.)

Requirements:

Achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas. Determine the area with a direct line of sight by totaling the regularly occupied square footage that meets the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing.
- In section view, a direct sight line can be drawn from a point 42 inches above the floor (Typical seated eye height) to perimeter vision glazing.

The line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office may be counted if 75% or more of the area has a direct line of sight to perimeter vision glazing. If less than 75% of the area has a direct line of sight, only the area with the direct line of sight count toward meeting the credit requirement. For multi-occupant spaces, the actual square footage with a direct line of sight to perimeter vision glazing is counted.

PK30 System Products Contribution:

Below is a sample plan that demonstrates the increase in the area that has direct line of sight to outdoor glazing resulting from the use of PK30 System's transparent partitions. The green shaded region represents areas that have a direct line sight without the need for transparent partitions. These areas are exterior offices or open office sections that promote views unobstructed by full height partitions and can be attributed to good floor design. The red region represents spaces that are not regularly occupied (i.e. closets, storage rooms, elevator bank). These areas are not included in the credit. The blue shaded regions are spaces that have direct line of sight to outdoor glazing because of the use of PK30 System's clear partitions. As you can see there is a significant increase in the area that has direct sight lines to the outdoors. For LEED, IEQ Credit 8.2 (see above) states that to receive a point 90% of all regularly occupied spaces must have a direct line to the outdoor environment. In the scenario represented by the sample plans, before the implementation of PK30 System's products an estimated 60% of spaces would have views to exterior glazing, not qualifying the space for a point under LEED IEQ 8.2. After PK30 System's products are put in place the area with direct line of sight to the outdoor environment increases to 100%, qualifying the space for a point*.
See below for the calculations.

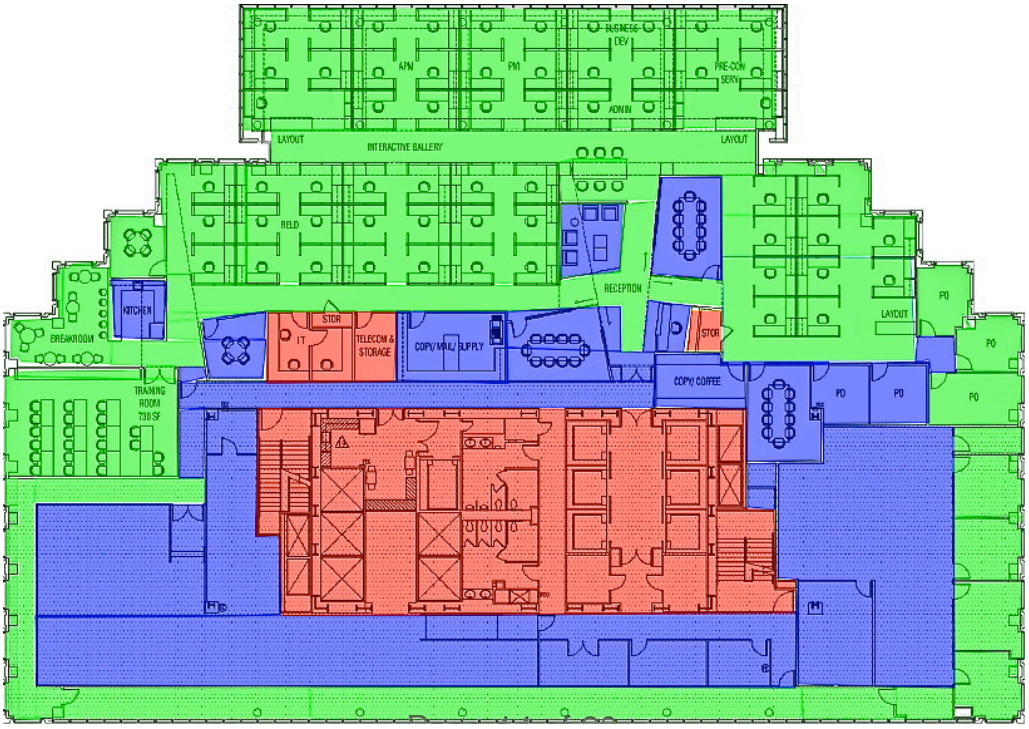

Figure 5: A sample plan showing the improvement of daylight and views by using PK30 System partitions

Square Footage of Compliant Area Without Glass Partitions (Green)	
Area	Sq. Ft.
Bottom Hall	1,215
Left Hall	361
Right offices	870
Training Room	651
Right Open Office Area	1,308
Top Open Office	4,711
Break Room Area	498
Reception Area	359
Sub Total	9,973
Percentage Compliant	60%

Square Footage of Complaint Area With Glass Partitions (Blue)	
Area	Sq. Ft
Bottom Open Office Area	1,804
Left Open Office Area	1,112
Right Inner Open Office Area	1,438
Conference Room and PO	655
Upper Inner Hallway	436
Trapezoid Conference Room	134
Copy/Mail + Adjacent Conf. Room	567
Reception Room	158
Large Standalone Conference	220
Kitchen	107
Room Next to Storage	63
Sub Total	6,694
Total (added to without Glass Partitions Sq. Ft)	16,667
Percentage Compliant	100%

Non-Regularly Occupied Space (Not Included In Calculation) (Red)	
Area	Sq. Ft.
IT/Telecom	299
Small Storage	48
Core Bathrooms/Elev	3,398
Sub Total	3,745

Total Area in Calculation	16,667
Total Daylight and Views Compliant Area	16,667
Percentage of Compliant Area	100%

Figure 6: Calculations for IEQ 8.

*Please note that the calculations for this credit will depend on the existing floor layout, height of cube partitions, and placement of other non-clear partitions or walls in your space. PK 30 System's products will help your project comply with this credit, but will not guarantee compliance.

From LEED:

- **LEED IEQ Credit 8.1 (for both FOR COMMERICIAL INTERIORS and BD&C)**

Requirements

The percentage of daylighting to be achieved for each point threshold is as follows:

Percentages	Points
75%	1
90%	2

Option 1. Simulation

Demonstrate through computer simulations that 75% (1 point) or 90% (2 points) or more of all regularly occupied spaces areas achieve daylight illuminance levels of a minimum of 25 foot-candle (fc) and a maximum of 500 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m. Areas with illuminance levels below or above the range do not comply. However, designs that incorporate view-preserving automated shades for glare control may demonstrate compliance for only the minimum 25 fc illuminance level.

OR
Option 2. Prescriptive

Use a combination of side lighting and/or top-lighting to achieve a total delighting zone that is at least 75% (1 point) or 90% (2 points) of all the regularly occupied spaces.

- Achieve a value, calculated as the product of the visible light transmittance (VLT) and window-to-floor area ratio (WFR) of daylight zone, between 0.150 and 0.180. The window area included in the calculation must be at least 30 inches above the floor.

0.150 < VLT x WFR <0.180

The ceiling must not obstruct a line in section that:

- Joins the window-head to a line on the floor that is parallel to the plane of the window;
- Is twice the height of the window-head above the floor in distance from the plane of the glass as measured perpendicular to the plane of the glass,

Provide sunlight redirection and/or glare control devices to ensure daylight effectiveness.

OR
Option 3. Measurement

Demonstrate, through records of indoor light measurements that a minimum daylight illumination level of 25 fc has been achieved in at least 75% (1 point) or 90% (2 points) of all regularly occupied areas. Measurements must be taken on a 10-foot grid for all occupied spaces and recorded on building floor plans.

Only the square footage associated with the portions of rooms or spaces meeting the minimum illumination requirements may be counted in the calculations. For all projects pursuing this option, provide daylight redirection and/or glare control devices to avoid high contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by daylight will be considered on their merits.

OR

Option 4. Combination

Any of the above calculation methods may be combined to document the minimum daylight illumination in at least 75% (1 point) or 90% (2 points) of all regularly occupied spaces. The different methods used in each space must be clearly recorded on all building plans.

In all cases, only the square footage associated with the portions of rooms or spaces meeting the requirements may be applied toward the 75% (1 point) or 90% (2 points) of total area calculation required to qualify for this credit.

In all cases, provide glare control devices to avoid high-contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

Definitions:

Visible light transmittance (VLT) is the percentage of visible light transparent or translucent openings transmit. Where building owners want plenty of natural light, they opt for high VLT values. Tinted glazings, which block glare by letting in less light, have low VLT ratings.

PK30 System's Products Contribution:

For IEQ Credit 8.1, PK30 System's transparent and translucent partitions drastically improve the daylighting of space. They increase the amount of space that has illuminance levels of 25 fc from natural light while also providing glare control adaptable to each case. The sample plans in Figure 5 provide a similar explanation of the exact contribution of PK30 System's products as listed in the IEQ 8.2 section. With the correct design of windows and office layout, implementing PK30 System's products should increase the amount of space receiving 25 fc of natural daylight by at least 20%. In the sample plans scenario, PK30 System's products will take the project from not achieving any points (60% of the space with acceptable daylight) to more than qualifying for two points (100% of the space with acceptable daylight). Please note that the placement and design of windows and interior walls has a large impact on the ability of a project to achieve this credit.

Conclusion:

By employing PK30 System's products, a project undergoing LEED certification will achieve an additional two to three points under IEQ Credit 8.1 and 8.2. PK30 System's transparent and translucent partitions not only improve the depth that natural daylight reaches into a space they also provide adaptable glare control for a multitude of situations.
Beyond LEED, numerous studies have shown that increased natural daylight and views to exterior glazing significantly increases worker productivity and decreases sick days (See Green Buildings and Productivity, Journal of Sustainable Real Estate). Additionally, delighting allows a space to decrease the connected interior lighting load improving energy performance and lower energy bills.

FSC Certified Wood

From LEED:

- LEED FOR COMMERICIAL INTERIORS MR Credit 7
- LEED BD&C MR Credit 7

Requirements
When using new wood-based products and materials, use a minimum of 50% that are certified in accordance with the Forest Stewardship Council's principles and criteria. Division 12 (Furniture) material value is included in the determination of the certified wood content.

PK30 System's Products Contribution:
Upon request, PK30 System will specify FSC-certified wood in their wood panel partitions. This FSC wood will come with full Chain of Custody forms, as required by LEED.

Conclusion

This overview focuses on four rating systems LEED for Commercial Interiors, LEED for New Construction, LEED for Core and Shell, and LEED for Schools as they are the systems that best apply to the projects where PK30 System's products will typically be implemented. Existing spaces undergoing the LEED for Existing Building's Operations and Maintenance certification and that have PK30 System's products already installed, will receive similar but slightly lessened LEED benefits to newly constructed or renovated spaces.
While no product will ever be "LEED Certified", PK30 System products assist in the LEED Certification process under:

- Recycled Content credit
- Regional Materials credit
- Enhanced Acoustic Performance for Schools credit
- Daylight and Views credit
- FSC Certified Wood credit

Upon request a manufacturer's letter certifying PK30 System's product's contribution to the above credits will be provided.

environmental
BUILDING STRATEGIES
1014 Howard Street
San Francisco, CA 94103
Phone: 415.329.7100