



# QUALITY & SUSTAINABILITY

YKK AP Guide to LEED v4 Certification

Entrances | Storefront | Curtain Wall | Window Wall | Balcony Doors | Windows | Sun Control

**YKK**  
**ap**<sup>®</sup>



# SUSTAINABLE BUILDING ENVELOPES

We at YKK AP America Inc. (YKK AP) follow our founder's core principle "No one prospers without rendering benefit to others.", this philosophy extends to the environment, the communities we service, live and work. YKK AP is committed to sustainability and transparency, its ISO 14001 certified manufacturing facility in Dublin, Georgia recently celebrated 25 years of providing products to help achieve LEED v4 credits for your sustainable design projects.

Today, architects, builders and developers of commercial buildings are reaching further for the best design practices involving "green" or "sustainable" design. These strategies that are incorporated into sustainable design reduce or eliminate the negative effects of buildings on the environment and its occupants.

Architectural products by YKK AP are always a smart choice for green buildings. We offer a wide selection of energy-efficient, thermally-broken products, as well as custom solutions for high performance green buildings.

With YKK AP, you have a dedicated partner in sustainable design. We work with you to create innovative, high quality architectural systems that add to the strength, efficiency and longevity of the building envelope, including:

**STOREFRONTS, CURTAIN WALLS, WINDOW WALLS, ENTRANCES, OPERABLE WINDOWS, SUNSHADES, LIGHT SHELVES, AND SLIDING DOORS**



## LEED v4 CERTIFICATION

The US Green Building Council (USGBC) LEED® v4 program went into effect on October 31, 2016. As in previous versions of LEED Certification, LEED v4 provides credits in a series of impact credit categories designed to benefit the local communities and the planet. Among the impact credit categories in LEED v4 are:

- Integrative Process
- Location & Transportation
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Material and Resources
- Indoor Environmental Quality
- Innovation
- Regional Priority

# GUIDE TO LEED v4 CERTIFICATION

## INTEGRATIVE PROCESS

<b>New Construction (1 point)</b>	<b>Data Centers (1 point)</b>
<b>Core and Shell (1 point)</b>	<b>Warehouses and Distribution Centers (1 point)</b>
<b>Schools (1 point)</b>	<b>Hospitality (1-5 points)</b>
<b>Retail (1 point)</b>	<b>Healthcare (1-5 points)</b>

Bring YKK AP in at the start! The intent of the “Integrative Process” is to support high performance, cost effective project outcomes through an early analysis of interrelationships among systems. This is where working with YKK AP early in the design phase allows our team to work with you to select product choices and strategies that create synergies with the rest of the building design.

## ENERGY AND ATMOSPHERE (EA)

Optimize Energy Performance

<b>New Construction (1-18 points)</b>	<b>Data Centers (1-18 points)</b>
<b>Core and Shell (1-18 points)</b>	<b>Warehouses and Distribution Centers (1-18 points)</b>
<b>Schools (1-16 points)</b>	<b>Hospitality (1-18 points)</b>
<b>Retail (1-18 points)</b>	<b>Healthcare (1-20 points)</b>

The intent of this credit is to achieve increasing levels of energy performance beyond the prerequisite of exceeding ASHRAE 90.1-2010 project baseline buildings by: **5% for new constructions, 3% for major renovations and 2% for Core and Shell.**

The goal is to reduce environmental and economic harms associated with excessive energy use by choosing an option below.

**Option 1: Whole-building energy simulation where the percentage over which the ASHREA 90.1-2010 is exceeded earns available points listed above.**

**Option 2: Prescriptive compliance: ASHRAE Advanced Energy Design Guide (1–6 points).**

Regardless of which option you choose, utilizing any of YKK AP’s line of thermally-broken, energy efficient framing systems, operable windows, sunshades or light shelves will improve the energy performance of the building envelope.

Our MegaTherm® and ThermaBond Plus® Systems join extrusions into one thermally-broken profile that saves energy and increase condensation resistance. Look for our enerGfacade® Brand products for maximum energy savings, performance and thermal comfort.

Our ThermaShade® sunshade is designed to reduce the Solar Heat Gain Coefficient (SHGC) of fenestration systems, thus reducing cooling loads. Our unique thermally broken anchor system for curtain walls reduces heating loads over traditional sunshade anchoring systems.

Our interior light shelf called Luminance® can be mounted to our framing systems and used to direct diffused natural light further into the building thus reducing daytime lighting loads.

# GUIDE TO LEED v4 CERTIFICATION

## MATERIALS AND RESOURCES (MR)

Building product disclosure and optimization with Environmental Product Declarations

<b>New Construction (1-2 points)</b>	<b>Data Centers (1-2 points)</b>
<b>Core and Shell (1-2 points)</b>	<b>Warehouses and Distribution Centers (1-2 points)</b>
<b>Schools (1-2 points)</b>	<b>Hospitality (1-2 points)</b>
<b>Retail (1-2 points)</b>	<b>Healthcare (1-2 points)</b>

The intent of this credit is to encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts to the planet. Project teams are rewarded for selecting products from manufacturers who have verified improved environmental life-cycle impacts.

### Option 1: Environmental Product Declaration (EPD) (1 point)

YKK AP America Inc. was the first Aluminum Framing manufacturer to produce Type III (product specific) Environmental Product Declarations (EPD's) to meet this credit requirement. YKK AP can provide 7 of the 20 Type III EPD's required from a minimum of 5 different manufacturers of products permanently installed on the building.

### Option 2: Multi-attribute optimization (1 point)

Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project. Products will be valued as below.

- Third party certified products that demonstrate impact reduction below industry average in at least three of the following categories are valued at 100% of their cost for credit achievement calculations.
- Global warming potential (greenhouse gases), in CO<sub>2</sub>e
- Depletion of the stratospheric ozone layer, in kg CFC-11
- Acidification of land and water sources, in moles H<sup>+</sup> or kg SO<sub>2</sub>
- Eutrophication, in kg nitrogen or kg phosphate
- Formation of tropospheric ozone, in kg NO<sub>x</sub>, kg O<sub>3</sub> eq, or kg ethene; and
- Depletion of nonrenewable energy resources, in MJ.
- USGBC approved program -- Products that comply with other USGBC approved multi-attribute frameworks

For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

To ensure product quality, consistency and integrity YKK AP produces its own aluminum alloy. Our aluminum framing extrusions contain a minimum of 30% by weight pre-consumer recycled aluminum – from internal processes and selective external recycling resources, therefore allowing us to maintain the high quality of our products and reducing the environmental impact of our products.





# RENEWABLE ENERGY PRODUCTION

**New Construction (1-3 points)**

**Core and Shell (1-3 points)**

**Schools (1-3 points)**

**Retail (1-3 points)**

**Data Centers (1-3 points)**

**Warehouses and Distribution Centers (1-3 points)**

**Hospitality (1-3 points)**

**Healthcare (1-3 points)**

The intent of this credit is to reduce the environmental and economic harms associated with fossil fuel energy.

The use of photovoltaic (PV) panels glazed in YKK AP products, such as storefront, window walls and curtain walls is a mean of contributing towards achieving this credit.



Elizabeth City State University - Mark Herboth



# GUIDE TO LEED v4 CERTIFICATION

## CONSTRUCTION & DEMOLITION WASTE MANAGEMENT

New Construction (1-2 points)

Core and Shell (1-2 points)

Schools (1-2 points)

Retail (1-2 points)

Data Centers (1-2 points)

Warehouses and Distribution Centers (1-2 points)

Hospitality (1-2 points)

Healthcare (1-2 points)

The intent of this credit is to reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing and recycling materials. YKK AP's aluminum framing is recyclable and can be diverted as a material stream or by purchasing pre-glazed factory or shop fabricated products such as windows and unitized wall systems, jobsite construction waste and recycling onsite during the construction process is reduced thus lowering the pounds per square foot of construction waste sent to landfills.

### Option 1: Diversion (1 or 2 points)

Path 1: Divert 50% and Three Material Streams (1 point)

OR

Path 2: Divert 75% and Four Material Streams (2 points)

### Option 2: Reduction of Total Waste Material (2 points)

Do not generate more than 2.5 pounds of construction waste per square foot (12.2 kilograms of waste per square meter) of the building's floor area.

YKK AP's aluminum extrusions are 100% recyclable and can be recycled locally for site assembled frames. Our extruded stocklengths can be optimized in 24 foot anodized and up to 30 foot painted thus reducing the amount of cut offs that need to be recycled and the weight transported to the recycler.



Pennsylvania Convention Center



# INDOOR ENVIRONMENTAL QUALITY (EQ)

Thermal Comfort Design

**New Construction (1 point)**  
**Core and Shell (1 point)**  
**Schools (1 point)**  
**Retail (1 point)**

**Data Centers (1 point)**  
**Warehouses and Distribution Centers (1 point)**  
**Hospitality (1 point)**  
**Healthcare (1 point)**

The intent of this credit is to promote the productivity, comfort and well-being of the building occupants by providing quality thermal comfort.

New Construction, Schools, Retail, Data Centers, Hospitality, Healthcare, and Office portions of Warehouses and Distribution Centers

## **Option 1: ASHRAE Standard 55-2010**

Envelope and HVAC designed to meet Standard 55-2010

## **Option 2: ISO and Cen Standards**

Envelope and HVAC meet the appropriate standard:

**ISO 7730:2005, Ergonomics of the Thermal Environment** - Calculate using the PMV and PPD indices and local thermal comfort criteria

**CEN Standard EN 15251:2007** - Indoor Environmental Input Parameters for Design and Assessment of Energy Performance of Buildings

**Follow Section A2 addressing indoor air quality, thermal environment, lighting and acoustics.**

YKK AP offers innovative thermal break technologies in our aluminum profiles. As previously described, our MegaTherm® polymer, our ThermaBond Plus® and Mechanical Lock Profile (MLP™) pour and de-bridged to help control the thermal comfort of the occupant. For increased thermal comfort, use our energy saving enerGfacade® brand products. These advanced framing options maintain higher interior surface temperatures on the aluminum framing thus protecting the thermal environment of the occupant. The enerGfacade® framing products also reduce the chance of condensation and the glazing allows natural light to reduce indoor lighting requirements during the day. YKK AP also offers MegaTherm® pressure plates for select 2-1/2" and 2" sightline curtain walls to reduce energy consumption and increase interior framing surface temperatures. Our ThermaShade and Luminance products can be added to reduce solar heat gain, provide better thermal comfort, and reduce glare thus increasing the thermal comfort of your building.

# GUIDE TO LEED v4 CERTIFICATION

## DAYLIGHT

**New Construction (1-3 points)**

**Core and Shell (1-3 points)**

**Schools (1-3 points)**

**Retail (1-3 points)**

**Data Centers (1-3 points)**

**Warehouses and Distribution Centers (1-3 points)**

**Hospitality (1-3 points)**

**Healthcare (1-2 points)**

The intent is to connect building occupants with the outdoors, reinforce circadian rhythms and reduce the use of electrical lighting by introducing daylight into the space.

Requirement is to provide automatic glare control with manual override and choose from the following options:

**Option 1: Simulation - Spatial Daylight Autonomy & Annual Sunlight Exposure (2-3 points, 1-2 points Healthcare)**

**Option 2: Simulation - Illuminance Calculations (1-2 Points)**

**Option 3: Measurement (2-3 Points, 1-2 points Healthcare)**

Daylight strategies using YKK AP's fenestration systems increasing the window to wall ratio of a building and allow for natural daylight to permeate the occupied space. YKK AP ThermaShade and Luminance products can be added to reduce solar heat gain, reduce glare, and increase daylight.

## QUALITY VIEWS

**New Construction (1 point)**

**Core and Shell (1 point)**

**Schools (1 point)**

**Retail (1 point)**

**Data Centers (1 point)**

**Warehouses and Distribution Centers (1 point)**

**Hospitality (1 point)**

**Healthcare (1-2 points)**

The intent is to connect the occupants to the natural outdoor environment by providing quality views. Warehouses and Distribution Centers only require the office portion.

Requirement is to provide 75% of all occupied floor area with a direct line of sight to the outdoors. The exterior image must be clear, unobstructed by frits, fibers, patterned, or tints that may distort color balance. In addition to the 75% of the occupied floor area, at least two of the following four kinds of views must be present. Multiple lines of sight to vision glazing in different directions at least 90 degrees apart

Views that include at least two of the following : (1) Flora, Fauna or sky; (2) Movement; and (3) objects at least 25 feet (7.5 meters) from the exterior of the glazing; Unobstruted views located within the distance of three times the head height of the vision glazing Views with a view factor of 3 or greater, as defined in "Windows and Offices; A Study of Office Worker Performance and the Indoor Environment"

Architects and designers can introduce more vision glazing to allow more natural daylight and quality views with the complete line of YKK AP aluminum framing systems.





## ACOUSTICAL PERFORMANCE

- New Construction (1 point)
- Core and Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses and Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1-2 points)

YKK AP's products are acoustically tested, and their acoustical performance can help contribute towards achieving this credit. Contact YKK AP for more information.

## INNOVATION

- New Construction (1-5 points)
- Core and Shell (1-5 points)
- Schools (1-5 points)
- Retail (1-5 points)
- Data Centers (1-5 points)
- Warehouses and Distribution Centers (1-5 points)
- Hospitality (1-5 points)
- Healthcare (1-5 points)

YKK AP can provide more post or pre-consumer aluminum recycled content on certain projects. The project must be reviewed prior to quotation to make sure we can meet the desired criteria and meet the project's schedule.



Georgia State University Law Building







# YKK AP Locations

## Headquarters

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