



# Sustainable Roofing Systems for Federal Facilities



**Sarnafil®**



## Meeting Congressional Mandates for Energy Efficiency



Roofing systems from Sika Sarnafil are ideally suited to fulfill the Congressional requirements of U.S. government procurement agencies — now under newly established directives to incorporate energy efficiency and sustainability into all facets of building construction.

Sika Sarnafil roofing systems have a documented history of performance that, in addition to watertight protection, includes energy efficiency, durability, recycling, and solar integration. These attributes are critical to sustainability and are specifically called for in recently enacted federal policies.

The company's vinyl roofing systems comply with federal directives for sustainable construction far better than other types of

roofing systems, including metal, bitumen, EPDM, TPO, and asphalt shingles.

Sika Sarnafil is a leader in the manufacture of cost-effective, high performance vinyl roofing and waterproofing systems. The company's record of achievement spans more than 40 years. Some 15 billion square feet of roofing and waterproofing membrane have been manufactured and used to protect facilities worldwide. Included are U.S. government complexes, universities, museums, hospitals, stadiums, and a full range of commercial and industrial facilities.

In recent years, dozens of federal agencies have relied on the performance of Sika Sarnafil roofing systems.







**Highlights — Energy Policy Act of 2005**

- Section 104 requires federal agencies to procure ENERGY STAR-qualified or FEMP-designated products
- Agencies directed to reduce facility energy per square foot by up to 20 percent by 2015, based on 2003 baseline
- Renewable electricity consumption must be not less than 7.5 percent by 2013
- At least one-half of renewable energy must come from new renewable sources
- Install 20,000 solar energy systems by 2010

**Sika Sarnafil Roofing Solutions are Compliant with...**

- Department of Defense Unified Facilities Criteria
- U.S. Postal Service Building Design Standards
- ENERGY STAR, LEED® & Green Globes™

▲ A Sarnafil® solar roof was the GSA's choice for the Frederick C. Murphy Federal Center in Waltham, MA.

The Energy Policy Act of 2005 (EPACT) includes key initiatives directed to government personnel responsible for the design, purchasing, construction, and maintenance of federal facilities. EPACT was reinforced in 2007 by Executive Order Number 13423, which was designed to develop high performance, sustainable government facilities. EPACT seeks, among other things, to optimize energy performance, promote energy efficiency, and reduce greenhouse gas emissions.

Newly quantified thresholds for energy conservation, along with corresponding timetables, were established. All new construction programs and major remodeling projects are expected to meet these targets.

The new directives mandate that ENERGY STAR®-qualified or FEMP-designated<sup>1</sup> products or systems be utilized whenever available.

Additional requirements include integrated design within all building programs and projects, use of renewable energy, acquisition of green products and services, increased diversion of solid waste, and cost-effective waste prevention and recycling programs.

**The white EnergySmart Roof® from Sika Sarnafil delivers a solar reflective index (SRI) of over 100.**

**The exceptional radiative properties of the roofing membrane help to minimize the heat signature of buildings, reduce air-conditioning cooling loads, and mitigate the urban heat island effect.**



Sika Sarnafil is a charter partner in the ENERGY STAR Roof Products Program launched in 1999 by the U.S. DOE and EPA.



<sup>1</sup> Department of Energy's Federal Energy Management Program





▲ This New York Air National Guard facility in Syracuse, New York, features a Décor Roof System from Sika Sarnafil. These vinyl roof systems give the appearance of a metal roof, yet provide maximum watertight protection.



# Making the Case for Sustainability ... Sika Sarnafil Roofing Systems Deliver

Roofing systems from Sika Sarnafil are a valuable resource to government agencies seeking to fulfill new directives relating to sustainable construction.

## Energy Efficiency

Buildings consume 40 percent of primary energy and 72 percent of the electricity in the U.S. Total energy expenditures for federal government facilities alone were \$4.26 billion in 2005. A large percentage of that energy usage is to cool buildings. Even in colder climates, many buildings are air-conditioned year-round due to internal heat.

Preventing solar radiation from elevating a building's internal temperature is an important strategy in reducing building cooling energy consumption.

Dark colored surfaces can be up to 70 degrees hotter in the sun than reflective white surfaces. This can have a tremendous impact on building heat gain. A study of buildings in Sacramento and Florida found that replacing a building's dark colored roof with a white reflective roof could reduce cooling energy consumption by 40 percent.

According to the U.S. DOE, replacing dark colored roofs with light colored, reflective roofs could result in national energy savings of about \$750 million per year.

Sika Sarnafil's EnergySmart Roof features a light colored surface that reflects a high percentage of solar radiation. This roofing membrane exceeds the cool roof requirements of ENERGY STAR, California's Building Energy Code (Title 24), LEED, and Green Globes.

## Greenhouse Gas, Pollution, and Urban Heat Island Mitigation

Carbon dioxide emissions are a major contributor to global warming. Buildings account for 35 percent of the emissions in

the U.S. Replacing dark colored roofs with reflective, light colored roofs on 80 percent of commercial building air-conditioned roof areas could reduce carbon dioxide emissions by 6.23 metric tons per year.<sup>2</sup>

Sika Sarnafil's EnergySmart Roof helps minimize the urban heat island effect caused in large part by a high density of dark colored surfaces in an urban environment.

## Durability and Longevity

Sika Sarnafil roofs last for decades. Independent scientific research organizations have evaluated and documented this performance...

- An independent panel consisting of industry consultants and government-related organizations from the U.S. and Canada studied the service life of roofing membranes. The group issued an interim report in 2005 indicating that Sika Sarnafil's composite score was excellent, and that the company's membranes performed well in virtually all categories.<sup>3</sup>
- The National Research Council of Canada (NRCC) collaborated with Sika Sarnafil on a longevity study of Sarnafil vinyl roof systems. Data showed that properly formulated, reinforced Sarnafil thermoplastic roof membrane systems, when properly maintained, could perform in excess of 20 to 30 years in various climates throughout Europe and North America.<sup>4</sup>
- The British Board of Agrément (BBA) conducted an independent analysis of Sarnafil vinyl roof membranes based, in part, on the NRCC study. The BBA issued a certificate indicating, "All available evidence suggests that the durability of Sarnafil membranes when used in accordance with the relevant BBA Certificates should have a life in excess of 35 years."<sup>5</sup>

## Solar Systems

The Solar Electric Roofing System integrates the company's reflective EnergySmart Roof with lightweight, thin-film photovoltaic cells. The system's clean power improves the building's energy efficiency and reduces utility bills. Building owners save money, especially during peak demand periods, and may get credit for feeding excess solar power into the local electrical grid.

## Green Roofs

Green roofs are healthy, sustainable and regenerative roof landscapes beneficial to the surrounding environment. Sika Sarnafil has been waterproofing green roofs for more than 35 years.

## Recycling Programs

Sika Sarnafil recycles more than 4 million pounds of membrane trimmings annually. In addition, a post-consumer recycling program allows building owners to recycle vinyl roofs at the end of their useful life. Millions of square feet of old roofing membrane have been recycled into new roofing products.

## Life Cycle Analysis

Carbotech, a leading European consulting firm, performed a comparative life cycle analysis of the most widely used low-slope roofing systems. The Sarnafil membrane received the highest rating.

## Environmental Stewardship

The New England Region of the U.S. Environmental Protection Agency awarded the prestigious Environmental Merit Award to Sika Sarnafil in 2005 for exceptional work and commitment on behalf of the environment.

<sup>2</sup> Ronnen Levinson and Hashem Akbari, Heat Island Group, Lawrence Berkeley National Laboratory, "Potential benefits of cool roofs on commercial buildings: conserving energy, saving money, and reducing emission of greenhouse gases and air pollutants," 2007.

<sup>3</sup> C.G. Cash, et al; Simpson, Gumpertz & Heger, Inc., Waltham, MA, USA; U.S. Army Corp of Engineers, CERL, Champaign, IL, USA; National Research Council, Ottawa, Ontario, Canada, "Predictive Service Life Tests for Roofing Membranes," DBMC International Conference on Durability of Building Materials and Components, Lyon, France, 2005.

<sup>4</sup> S.P. Graveline, H.R. Beer, R.M. Paroli, A.H. Delgado, "Field Investigation and Laboratory Testing of Exposed Poly (Vinyl Chloride) Roof Systems," Proceedings of the RCI 20th Annual International Convention and Trade Show, Miami, Florida, 2005.

<sup>5</sup> British Board of Agrément Assessment Report Nos. 08/4531 and 08/4532, 2008.



### National Laboratory Validates Energy Savings with EnergySmart Roof System

A scientific study conducted by the Lawrence Berkeley National Laboratory proved that the EnergySmart Roof system from Sika Sarnafil lowers energy consumption, when compared to a dark-colored roofing system.

Researchers monitored air-conditioning consumption and peak electrical demand at a 100,000 sq. ft. facility in Austin, Texas — prior to and after replacement of the original EPDM roof with a Sika Sarnafil EnergySmart Roof.

The study, commissioned by the U.S. DOE and EPA, showed that the EnergySmart Roof reduced peak summertime air-conditioning demand by 14 percent. Annual energy savings were estimated at \$7,200 (7.2 cents per square foot per year).<sup>6</sup>



## Long-term Relationship with Federal Agencies

**Sika Sarnafil has been an active participant in U.S. government procurement for more than 25 years. Listed on these pages are selected activities relating to these programs.**

### U.S. Military

System configurations from Sika Sarnafil adapt well to typical military environments, including coastlines where high winds and driving rains can pose problems for other roofing systems.

The company has a Metal Retrofit System that is an ideal replacement for failing metal roofs now on U.S. military facilities.

The variety of colors available with Sika Sarnafil systems meet military requirements. Membranes are available in seven standard colors and virtually unlimited custom colors.

### U.S. Postal Service

The company has installed millions of square feet of vinyl roofing on postal service facilities. Many of these facilities function as Processing and Distribution (P&DC) centers.

### General Services Administration

As the government's property owner, GSA has orchestrated the specification of Sika Sarnafil roofing systems on dozens of client agency facilities.

### U.S. Department of Energy

The company received the 2005 Premier Business Partner award for its commitment to the Rebuild America program, and for helping communities to save energy. It was the second time Sika Sarnafil received the award.



<sup>6</sup> Lawrence Berkeley National Laboratories (LBNL – 47149). Copies available upon request.





▲ United States Postal Service facility, Buffalo, NY.

### Contracting with Disadvantaged Groups

Sika Sarnafil markets its roofing systems through authorized applicators, including qualified enterprises distinguished as Service-disabled, 8(a), Minority or Woman-owned.

#### Partial Listing — Sika Sarnafil Experience with U.S. Government

*Air Force Reserves*  
*Air Mobility Command*  
*AMTRAK*  
*Army Corps of Engineers*  
*Army Reserves*  
*DECA – Defense Commissary Agency*  
*Department of Veterans Affairs*  
*Environmental Protection Agency*  
*Federal Aviation Administration*  
*Federal Bureau of Investigation*  
*Federal Bureau of Prisons*  
*General Services Administration*  
*Jet Propulsion Laboratory*  
*Lawrence Berkeley National Lab*

*Lawrence Livermore National Lab*  
*National Aeronautics & Space Administration*  
*National Archives & Records Administration*  
*National Park Service*  
*National Wildlife Health Center*  
*NAVFAC*  
*Navy Region South West*  
*OSD – Office of Secretary of Defense*  
*Otis Air Force Base*  
*STRATCOM – Air Force Strategic Command*  
*The Smithsonian Institute*  
*US Air Force*  
*US Army*  
*US Coast Guard*  
*US Department of Interior*  
*US Postal Service*



#### Sarnafil Milestone Management™

The Sarnafil Milestone Management™ process integrates proven materials, skilled workmanship, and expert assistance into every phase of every project for comprehensive quality control. The result: peace of mind for architects, engineers, owners, and occupants alike.

**Sarnafil®**

## Sika – Your Local Partner with a Global Presence

Sika is a globally active company in the specialty and construction product and chemicals businesses. It has subsidiary manufacturing, sales and technical support facilities in more than 70 countries around the world.

Sika is THE global market and technology leader in waterproofing, sealing, bonding, dampening, strengthening and protection of buildings and civil engineering structures.

Sika has more than 12,000 employees worldwide and is therefore ideally positioned to support the success of its customers.



### Sika Sarnafil

A Division of Sika Corporation  
100 Dan Road  
Canton, MA 02021  
Telephone 1-800-451-2504  
Telefax 781-828-5365  
Internet [www.sikacorp.com](http://www.sikacorp.com)

### Sika Sarnafil

A Business Unit of Sika Canada Inc.  
6820 Davand Drive, Unit 2  
Mississauga, Ontario  
L5T 1J5 Canada  
Telephone 1-800-268-0479  
Telefax 905-670-5278  
Internet [www.sika.ca](http://www.sika.ca)

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