CEMSTONE®

FREQUENTLY ASKED QUESTIONS

Q. What is the difference between cement and concrete?

While the terms are sometimes used interchangeably, concrete and cement are not the same. Cement, a fine gray powder, is a key ingredient in concrete production. Cement typically comprises 10 to 12 percent of the entire mix. When cement is mixed with water, sand and gravel, it turns into concrete–the rock-like substance associated with sidewalks, roadways, building foundations, and more.

Q. What is sustainability and why is it important?

Sustainability refers to the ability to build for today and tomorrow without depleting future resources. A growing global population is beginning to strain the finite resources available on the planet. Sustainability seeks to balance the economic, social and environmental impacts, recognizing that population growth will continue. Sustainable development brings this evaluation to the design and construction industry.

Q. Why the recent demand for sustainable development?

Recognizing that U.S. buildings use nearly 10 percent of the world's energy, there is an increasing demand for sustainable development and green building practices. In fact, U.S. buildings use three times more energy than similar buildings in similar climates in Europe. Therefore, the U.S government is adopting green building programs and an increasing number of states are offering tax benefits for green public buildings.

Q. What is a green building?

The U.S. government defines green buildings as those that demonstrate the efficient use of energy, water and materials; limit impact on the outdoor environment; and provide a healthier indoor environment. Studies show that green buildings offer improved air quality and more access to daylight in addition to energy and cost savings.

Q. What makes concrete a sustainable/green building material?

Concrete is a responsible choice for sustainable development. Its durability is a significant sustainable attribute of concrete because it will not rust, rot, or burn, requiring less energy and resources overtime to repair or replace. Structures built with concrete have optimal energy performance. Additionally, concrete is easy to use, incurs little waste and can be readily recycled.

Q. What makes concrete so durable?

The primary ingredients of concrete, sand, gravel, and cement are mineral based. When mixed with water, the cement molecules chemically combine with the water to create a crystalline matrix of high compressive strength. This matrix binds the sand and gravel together, creating what is sometimes known as "liquid stone." Unlike other construction materials that can rust or rot, moisture is a necessary component in making concrete.

Q. What is energy efficient about concrete?

Structures built with concrete have optimal energy performance. Homes and buildings constructed with insulated concrete walls are not subject to large daily temperature fluctuations. This means home or building owners can lower heating and cooling bills up to 25 percent. Also heating, ventilating and air-conditioning can be designed with smaller-capacity equipment. High performance insulated concrete wall systems provide high R-value and thermal mass with low air infiltration to provide superior thermal efficiency.

Q. How does concrete relate to recycling?

Recycling is part of concrete's life cycle from the beginning. Several common industrial byproducts like fly ash and slag that would otherwise add to landfills are incorporated into concrete mixes. Use of these byproducts also reduces reliance on raw materials. Finally, when a concrete structure has served its purpose, it can be crushed for use as aggregate in new concrete or as base materials for roads, sidewalks and concrete slabs. Even the reinforcing steel in concrete (which often is made from recycled materials) can be recycled and reused.

Q. How does concrete affect the environment compared to wood and steel?

Concrete is one of the most inert building materials in use today. It does not rot, burn or rust, providing durability that significantly outlasts many other building materials including wood and steel. The cement industry utilizes industrial byproducts like fly ash and consumes less energy than its competitors. According to the Department of Energy, U.S. cement production accounts for 0.33 percent of energy consumption—lower production levels than steel production at 1.8 percent and wood production at 0.5 percent. In addition, it places less stress on our environment to acquire the raw materials for concrete than steel or wood. Thus, concrete is an excellent choice for sustainable development.

Q. What is the urban heat island effect and how does concrete fit in?

Scientists observed that urban areas with more buildings and paving and less vegetation are typically warmer than surrounding rural areas. This is partially attributed to the dark surfaces of roofing and paving used to create our built environment. Temperature increases have been measured as high as 8 degrees Fahrenheit. This additional heat causes air conditioning systems to work harder and consume more energy, as much as 18 percent. The additional heat also enhances the conditions for the creation of smog. Concrete's natural light color can reduce urban heat islands. Light-colored concrete reflects more solar energy than dark-colored materials – whether on parking lots, driveways, or side-walks–thereby reducing the high temperatures.

Q. What are the environmental downsides to using concrete?

There has been a 33 percent reduction since 1975. Industry research and changes in manufacturing standards are seeking ways to reduce the carbon dioxide production even further. Concrete's durability and energy-efficiency minimize maintenance, repair and heating and cooling needs, providing benefits that outweigh manufacturing energy needed.