



MEGASLAB CASE STUDY

Wolfspeed Inc.

Wolfspeed, Inc. – a global leader in wide-bandgap semiconductor manufacturing – is building a new, state-of-the-art, multi-billion-dollar materials manufacturing facility. Once completed, it will be the largest silicon carbide materials facility in the world and will create a more than tenfold increase in Wolfspeed's current silicon carbide semiconductor production capacity, accelerating the adoption of energy-efficient semiconductors across a wide array of markets, from industrial to energy.

Project

Wolfspeed
Siler City Factory (SCF)

Location

Chatham County,
North Carolina

Primary Industry

Manufacturing

General Contractor

The Whiting-Turner
Contracting Company

Concrete Contractor

Wayne Brothers

Project Results

- Extended joint slab on ground
- Highest classification of abrasion resistance
- Superior adhesion of epoxy coatings
- Elimination of surface hardener
- Elimination of steel reinforcing
- Low shrinkage, reduced potential for cracking and curling
- Accelerated speed of installation and cure time
- + 40% reduction in CO₂

MEGASLAB Engineered Concrete System Reduces Carbon Emissions by More Than 40% for the Wolfspeed Project

Wolfspeed is able to achieve material environmental and sustainable benefits from MEGASLAB's proven durable and impermeable concrete floor slabs.

To support the advanced manufacturing operations at its new SCF facility, Wolfspeed requires a highly durable concrete floor able to withstand the automated guided vehicles (AGV) and high traffic of its cleanroom facility for decades to come.

Another key project requirement was obtaining LEED certification. To ensure the project's success, Wolfspeed implemented Integrated Project Delivery (IPD), a method involving engagement of the engineering, architectural, and construction team early in the design phase. This proactive approach enabled Wayne Brothers to advocate for MEGASLAB as the optimal concrete solution, aiding Wolfspeed in attaining its LEED certification.

MEGASLAB Use Key Results



Increased Durability Strength

Ordinary **5000 PSI slab** replaced by **6000+ MEGASLAB** with 900+ PSI flexural strength.



2x Life Expectancy

MEGASLAB remains flat and durable for **over twice as long** as ordinary concrete for less maintenance and downtime and a lower total cost of ownership.



1/3 Reduction in Slab Thickness

Reduction of slab thickness **from 9 inches to 6 inches** with increased performance and durability.



+ 40% Carbon Reduction

Over 40% reduction in embodied carbon associated with the MEGASLAB concrete system allowing Wolfspeed to claim a reduction in its Scope 3 emissions.



Steel Rebar Eliminated

For **faster construction schedules and lower carbon emissions** from the elimination of steel rebar.



70% Fewer Joints

For incredibly flat surfaces **that remain flat** over time, increasing operational efficiencies.



Wolfspeed's Operational Benefits

MEGASLAB provided an innovative low carbon concrete slab solution capable of withstanding heavy loads with exceptional durability and resistance against wear and tear. Using MEGASLAB allowed Wayne Brothers to accelerate the construction schedule and provide significant upfront cost-savings.

1. Faster Construction Schedule

MEGASLAB introduced a high-performance 6-inch concrete slab, compared to the originally specified 9 inches with rebar. It also replaced an ordinary 5,000 PSI slab with a +6,000 PSI MEGASLAB.

This thinner design without rebar allowed for faster prep, placement and curing of the concrete, speeding up the whole construction process. As a result, the entire building timeline was shortened, saving both time and money.

2. Ability to Handle Heavy Traffic and Loads

Manufacturing facilities like Wolfspeed's are places of intense activity, with heavy machinery anchored to the slab and substantial loads moving across the slab 24/7.

Wolfspeed also uses portable robots called automated guided vehicles (AGV) to transport heavy materials around the large industrial space. The AGV traffic and weight create a lot of abrasion on a typical concrete slab, leading to damaged floors.

MEGASLAB provides a more durable surface that can withstand the repeated path of the AGVs due to its higher abrasion resistance.

3. Less Wear and Tear on Machines

Ordinary concrete with joints every 12 to 15 feet that curl can cause damage to the wheels of manufacturing equipment like AGVs, leading to premature wear and tear and inefficient operations. Slab repairs and machine maintenance can lead to costly downtime for a facility like Wolfspeed's.

MEGASLAB's extended joints remain smooth and virtually curl-free over time, reducing the amount of stress on the machinery for optimal performance and reducing disruptions caused by downtime, enhancing overall operational efficiency.

4. Environmental Sustainability

Wolfspeed's sustainability commitment is well documented. The company is built on the power of energy-efficient silicon carbide and strives to drive change that transforms communities, industries, and the world by powering more and consuming less.

MEGASLAB enables Wolfspeed to uphold its sustainability commitment since its efficient design results in fewer concrete trucks, less carbon-intensive cement, and no rebar. MEGASLAB's longer-lasting concrete also reduces the need for repair or replacements, lowering the carbon footprint of the concrete over its lifetime.

In total, MEGASLAB reduced the embodied carbon of the concrete used in the slabs on ground by over 40%. In addition to the lower embodied carbon footprint from the initial installation of MEGASLAB, there will be efficiencies found in daily operations due to the smooth, flat jointless surface.

5. Supports a Cleanroom Environment

Wolfspeed required a dense, durable floor slab to ensure operational efficiencies. MEGASLAB was able to deliver an innovative product that achieved this, while also significantly reducing the embodied carbon footprint of the facility.

66 "The innovative design of MEGASLAB has been invaluable in helping us achieve our client's goals in the construction of this new SCF facility. With MEGASLAB's solution, we're confident Wolfspeed will see a significant improvement in operations and fewer delays and downtime from slab repair and maintenance."

CHAD HENSLEY

Executive Vice President of Business Management | Wayne Brothers

In conclusion, MEGASLAB's innovative concrete solutions have significantly elevated the construction and sustainability aspects of Wolfspeed's new SCF facility. By ensuring longevity, reduced carbon footprint, and operational efficiency, MEGASLAB not only meets but exceeds the demands of modern manufacturing environments. Their partnership with Wolfspeed showcases how strategic construction choices can lead to long-term operational and environmental benefits.

For more information about MEGASLAB, visit megaslab.com.