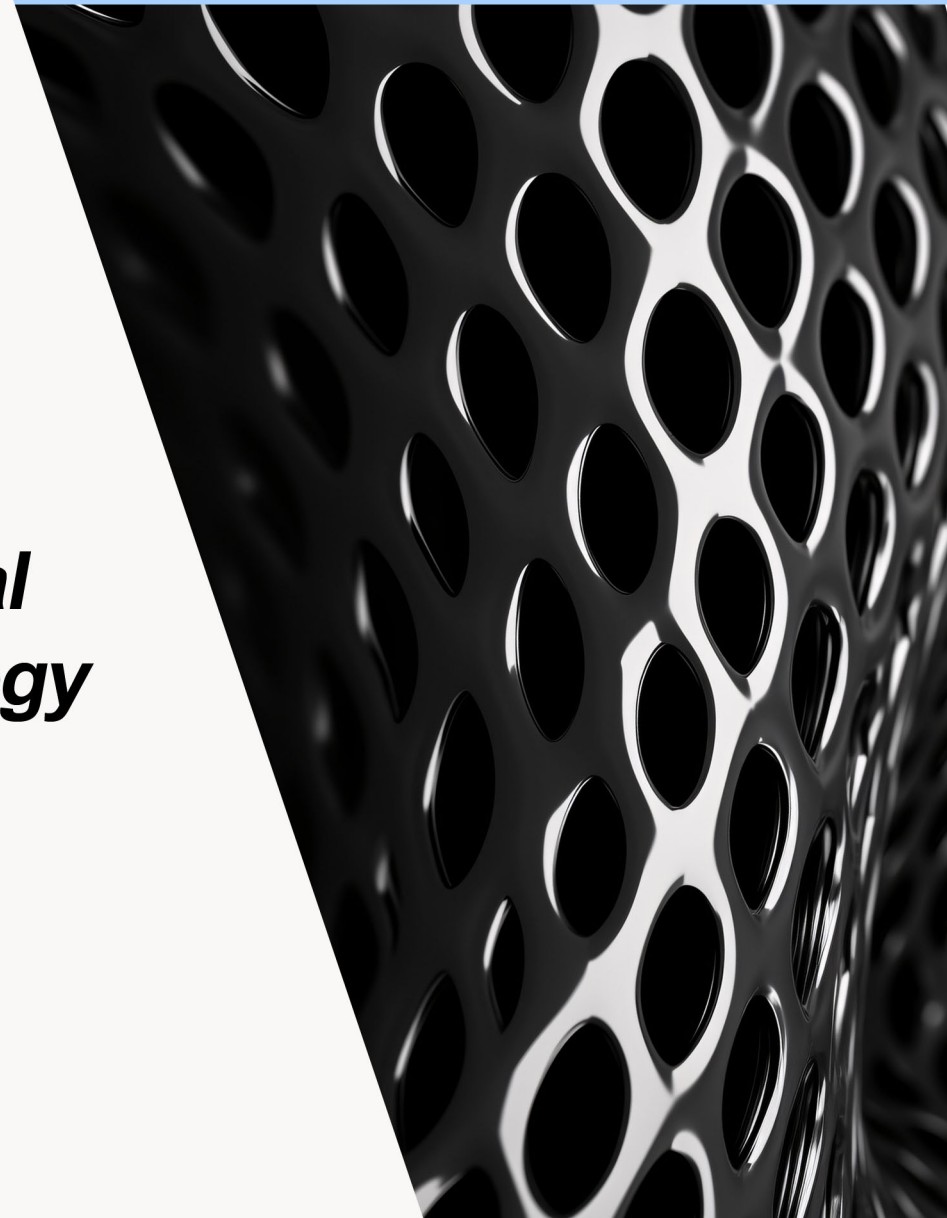


## ***Introduction***

# ***Intelligent Concrete for Structural Monitoring — A Ready Technology for the Global Market***



## ***A Global-Scale Problem***



- 40% of all major construction projects require repairs earlier than expected.
- Main reason: invisible internal damages not detected by traditional methods.
- Monitoring cost: from \$50,000 to \$500,000 per project (sensors, maintenance, diagnostics).
- Examples: Genoa Bridge collapse (Italy, 2018) — 43 fatalities, \$500M damage.  
Carolabrücke collapse (Dresden, Germany) — damage up to €150M.



## ***Applications in Energy Storage***

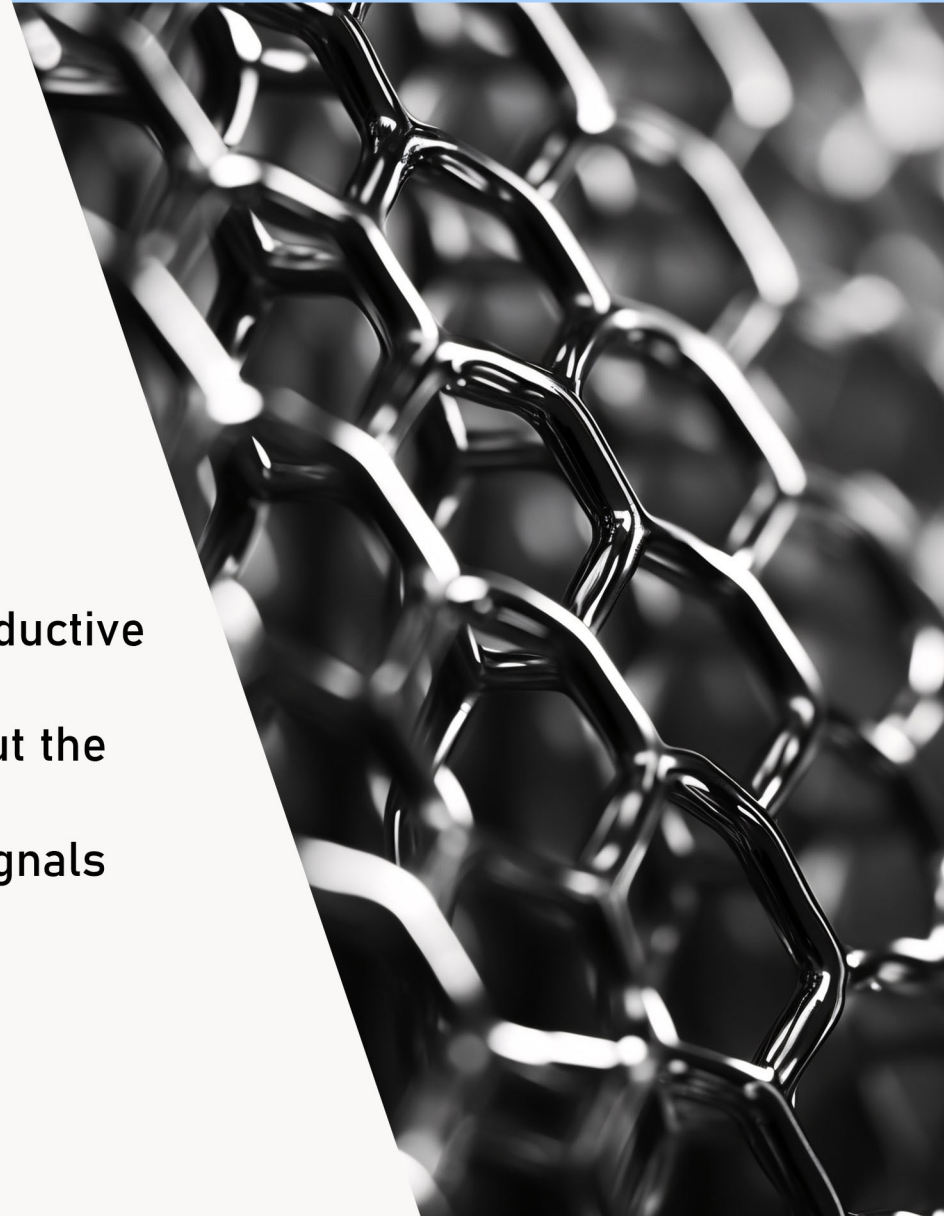
### **Solid Electrolytes Based on Graphene**

- Using special concrete infused with graphene dispersion, we can create solid electrolytes with high conductivity.
- These systems resist thermal degradation, emit no toxic gases, and are easily adaptable to the shape of structures.
- An excellent solution for stationary energy storage and architectural integration.

## ***Our Solution***

### **We made the concrete itself the sensor:**

- Reinforcing fibers (glass or basalt) coated with a conductive graphene layer resistant to alkaline environments.
- These fibers form a 3D conductive network throughout the structure.
- Simple electrodes are embedded into the concrete signals are captured by an external device or IoT controller.
- No separate sensors .. no weak points.





## Test Results

- Resistance without defects: 10-20 k $\Omega$ , stable (unaffected by moisture or drying).  
Crack 0.5-1 mm - resistance  $\uparrow$  2x.
- Crack >1 mm - resistance  $\uparrow$  3-5x.
- Complete structural failure  $\rightarrow$  active resistance becomes negative (emergency signal).
- Results confirmed on multiple samples (slabs 20 $\times$ 20 $\times$ 5 cm).



## ***Economic Impact***

- Reduction of monitoring costs by up to 10x.. → no separate sensors or maintenance required.
- Mass production of low-cost construction material → increase in concrete cost less than 10%.
- Market potential: over \$15 billion annually (source: Verified Market Reports).
- Additional value: smart concrete raises infrastructure value and reduces insurance risks.



## ***Key Advantages of the Technology***

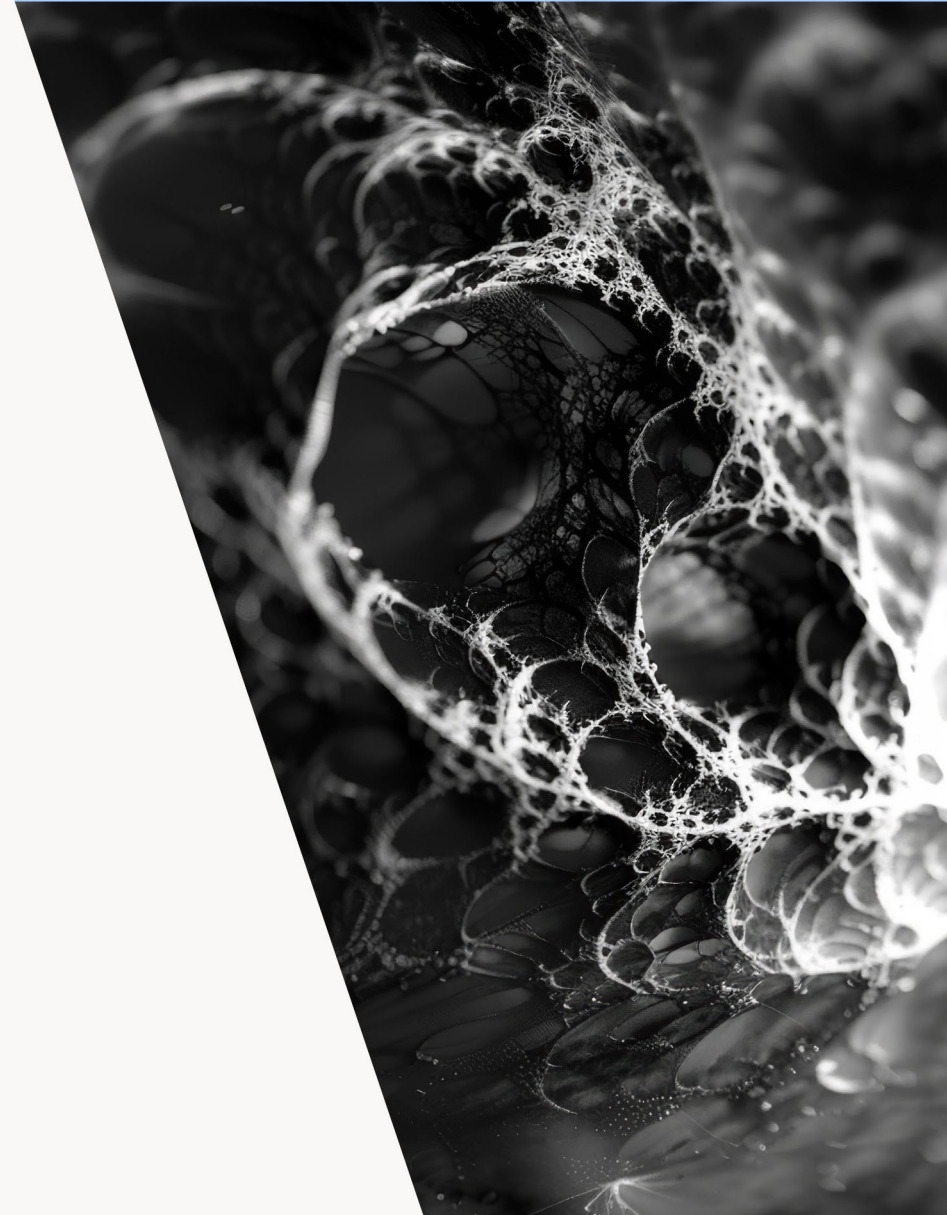
- Fully integrated monitoring, no external devices needed.
- Reliable under all conditions: wet, dry, or aged concrete.
- High precision: detection of microcracks as small as  $\pm 0.05$  mm.
- Simple to use: measurements can be taken with a standard multimeter within seconds.
- Scalable for use in bridges, tunnels, high-rise buildings, and dams.
- Environmentally friendly: safe and durable composition.





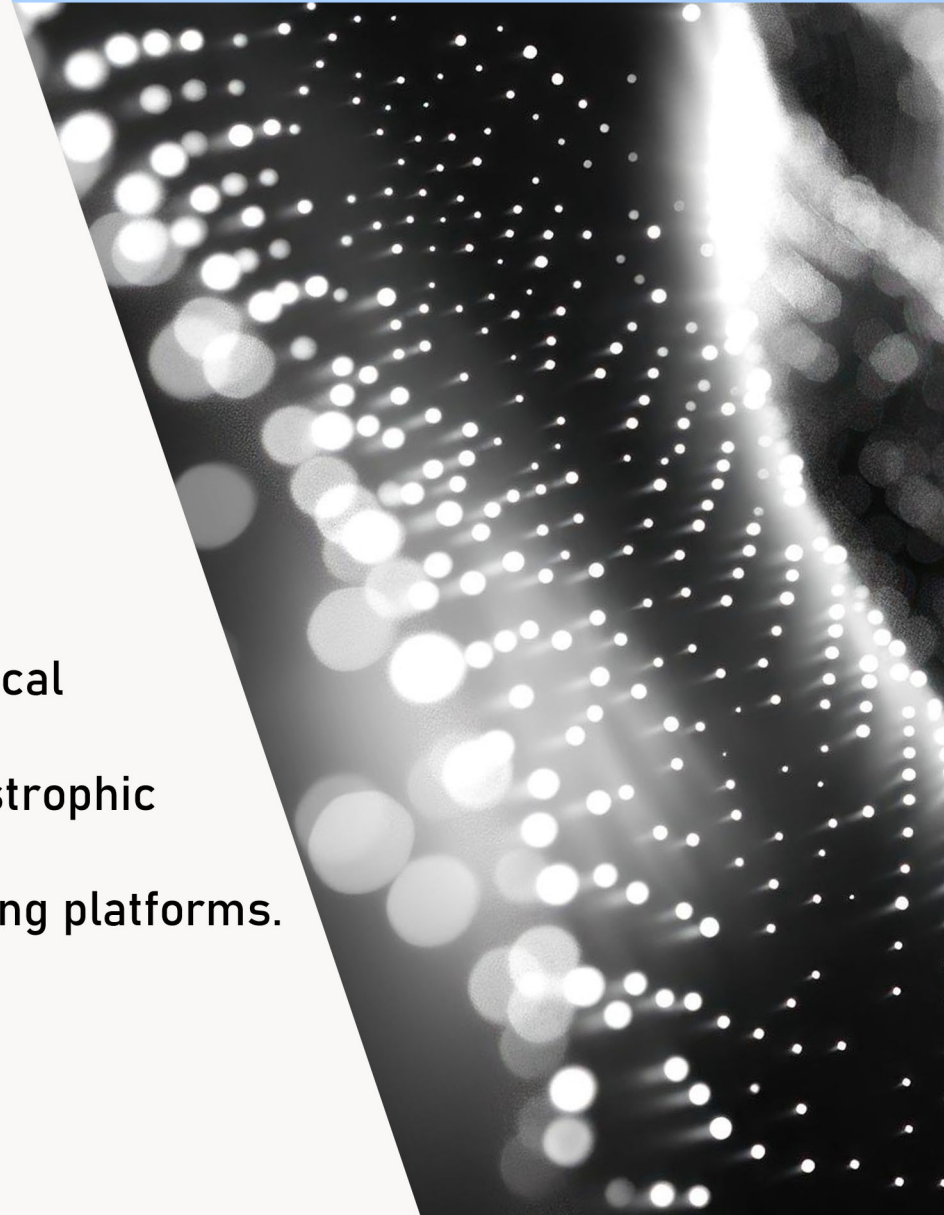
## ***Patent Protection***

- Utility model registered in Germany (2025).
- Ready for registration in China, UAE, EU, and USA.
- Option for joint local registration with investors for accelerated deployment.



## ***Potential Markets and Partners***

- Construction corporations (bridges, metro systems, skyscrapers).
- Government projects → enhancing the safety of critical infrastructure.
- Insurance companies → minimizing the risk of catastrophic failures.
- IoT companies → integration into advanced monitoring platforms.



## ***What We Are Looking For***

- Partners for pilot projects in the Arab world, China, and the EU.
- Investors to scale up production and secure global market entry.
- Co-development of IoT platforms and turnkey smart monitoring solutions.



## ***Final Call to Action***

**We have made concrete smart.  
We are ready to build the infrastructure  
of the future together with you.**