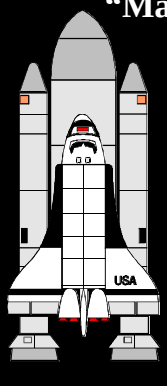
“Making Concrete In Space”
Mark A. Bury
Master Builders, Inc.
Quality Concrete for the 21st Century

“Making Concrete In Space”



It’s Out Of This World!

Quality Concrete For The 21ST Century

Mark A. Bury
Master Builders, Inc.

Lunar Construction Research:

Japanese Spend $40,000,000!!!

Wall Street Journal
April 2, 1997

What Can Be Learned From Mixing Concrete In Space?

- Gain Better Understanding Of Concrete.
- Assess Similarities Or Differences Between Concrete Made In Space And Concrete Made On Earth.
- Examine Microstructure Using ESEM.

What Can Be Learned From Mixing Concrete In Space?

- Examine Physical Properties.
- Understand Relationship Between Microscopical And Physical Differences.
- Results, In Part, Will Lead To The Next Generation Of High-Performance Concrete.

OBJECTIVE

To Determine The Effects Of Microgravity On The Mixing And Curing Of Concrete.

MISSION STS-68

Space Shuttle "Endeavour" OV-105

LAUNCH

September 30, 1994, 7:16 am EDT

Kennedy Space Center, Florida

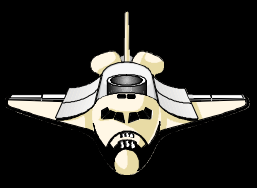
LANDING

October 11, 1994, 1:02 P.M. EDT

Edwards Air Force Base, California

MISSION DURATION

11 Days, 5 Hours, 47 Minutes, 8 Seconds



ANALYSES OF MORTARS

EARTH REFERENCE SAMPLE

Mixing Date: December 8, 1994 EDT
Cleveland, Ohio.

Parameters: Vacuum, Temperature, Time, Orientation of Mixer, Mechanical, and Gravity.

PERMEABLE PORE SPACE

Microgravity: 24%

Earth: 26%

SPECIFIC GRAVITY

Microgravity: 2.62

Earth: 2.58

COMPRESSIVE STRENGTH

Microgravity: 7600 psi

Earth: 5700 psi

MISSION ACCOMPLISHED

- **Developed a viable mixing chamber for making concrete in a zero gravity environment.**
- **Produced the world's <u>first and only</u> concrete mixed and cured in space.**