

# *Alabama Concrete Institute*

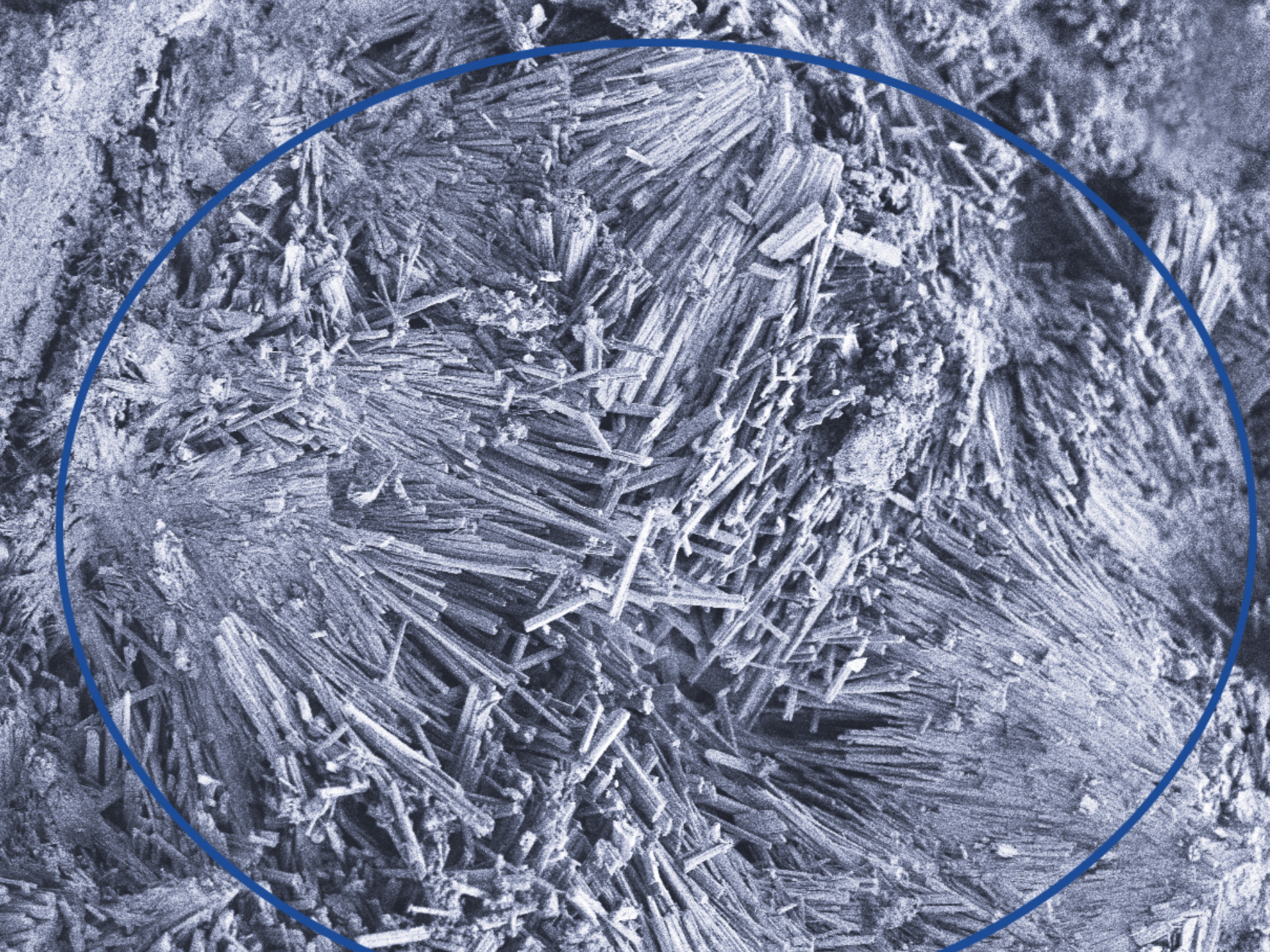
## *Day of Concrete Knowledge*

- What is Crystalline Waterproofing?
- Where can it be used?
- How is Crystalline used as a waterproofing admixture?
- What should the design professional consider when using Crystalline Admixtures?
  - Dosage
  - Details
  - Performance
- Xypex approach to the marketplace
  - Stand-Alone
  - Redundancy

# Xypex Chemical Corporation

- 50 years experience in Crystalline Waterproofing Technology.
- Based in Richmond, BC, Canada
- Operations in over 90 Countries
- Most extensive testing conducted by independent and third party testing agencies.
- LEED Certified







# XYPEX

Admix

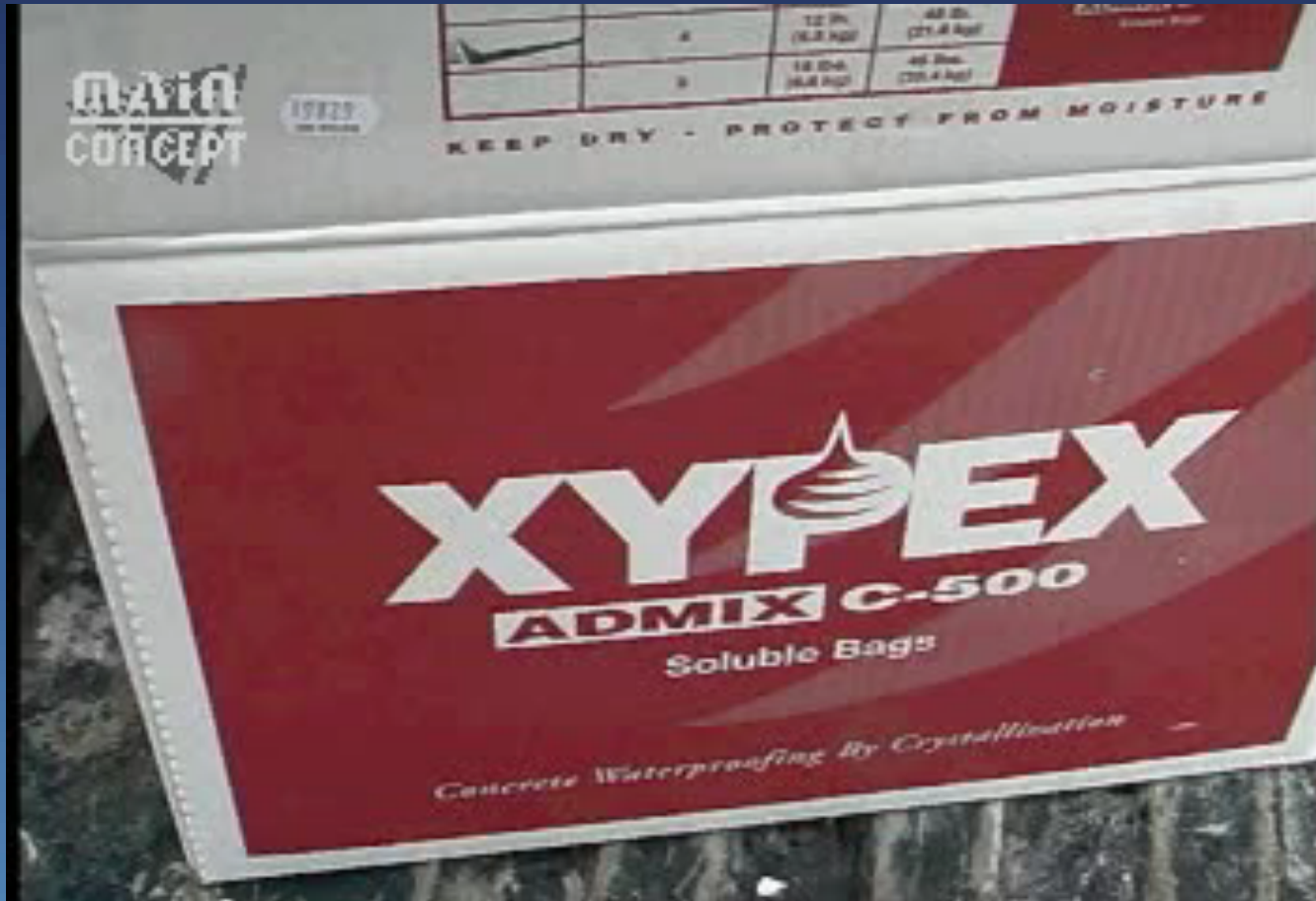




The logo for XYPEX CHEMICAL CORP is centered on a background of blue, rippling water. The word "XYPEX" is written in a large, bold, white, sans-serif font. The letter "P" is stylized, with a white oil drop shape integrated into its upper curve. To the right of the "X" in "XYPEX" is a registered trademark symbol (®). Below "XYPEX" is the text "CHEMICAL CORP" in a smaller, white, sans-serif font.

**XYPEX**<sup>®</sup>  
CHEMICAL CORP

# When is Xypex Admix Introduced into the concrete?





There are various versions and grades within Xypex Admix C-Series!

<b>Regular Grade</b>	<b>No Fines Grade</b>
<b>Admix C-500</b>	<b>Admix C-500 NF</b>
<b>Admix C-1000</b>	<b>Admix C-1000 NF</b>
<b>Admix C-2000</b>	<b>Admix C-2000 NF</b>

# Xypex Product Offering

For Ready Mix its Admixtures

C-500 = Set Neutral

C1000 = 2 – 3 Hour Delayed Set

C2000 = 4 – 6 Hour Delayed Set

Typical Concrete Set Time = 5 – 6  
hours from Placement, Working Time =  
2 – 3 Hours (Factors = Temp, w/cm  
Ratio, cm Content, Admix)



# Xypex Product Offering

## Dosage Rates:

Waterproofing Only – 2% of Cementing Materials

Waterproofing and Chem. Resistance – 3% of Cem. Materials

Higher Dosage Rates will Introduce / Increase Retardation

Cementing Materials = Cement and Slag, Not Pozzolans = Fly Ash and Silica Fume

“Cementing Materials” Does not Equal “Cementitious Materials”

## Packaging:

Dispersible Bags, 10, 12, 15 Lb Bags

Paper Bags – 40 & 50 lb/bag

Pails – 60 lb/pail

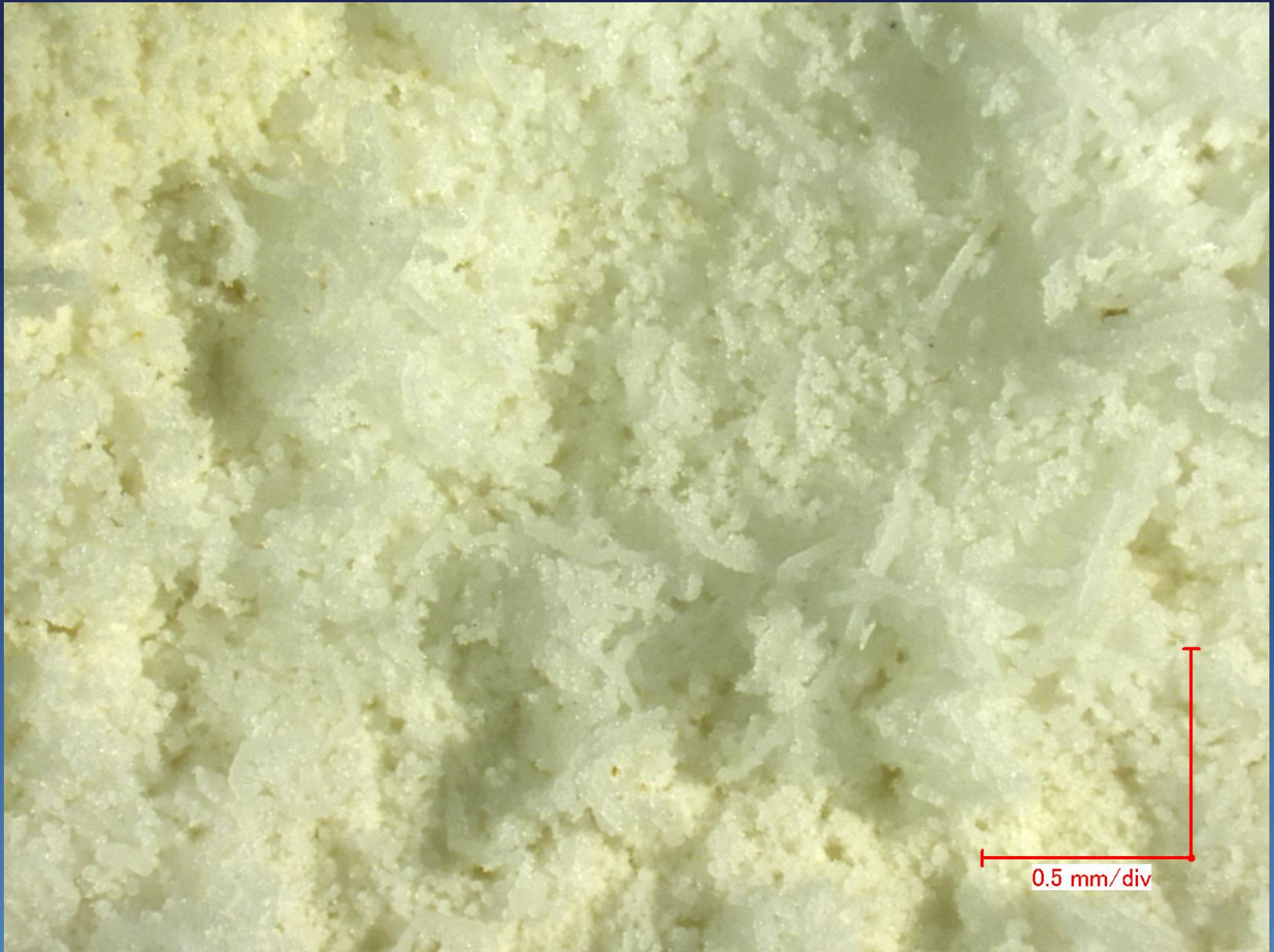


# Recommended dosage rate for the various grades of the Admix.

<b>Admix Type</b>	<b>For Normal Waterproofing and Durability</b>	<b>For Extra Chemical Protection or Special Applications</b>
<b>C-500 C-1000 C-2000*</b>	<b>2%</b>	<b>3%</b>
<b>C-500 NF C-1000 NF C-2000 NF*</b>	<b>1%</b>	<b>1.5%</b>

Based on % of cement or cement + pozzolan/slag depending on mix design







# Target Admix Jobs

Tunnels

Water Treatment Plants

Waste Water Treatment Plants

Pools / Fountains / Cooling Towers

Below Grade – parking decks &  
foundations

Bridges

Dams and Power Plants

Chemical Plants, Refineries

Precast – piles, vaults, pipe

# A Guideline for using the Admix in Concrete with various different cementitious components.

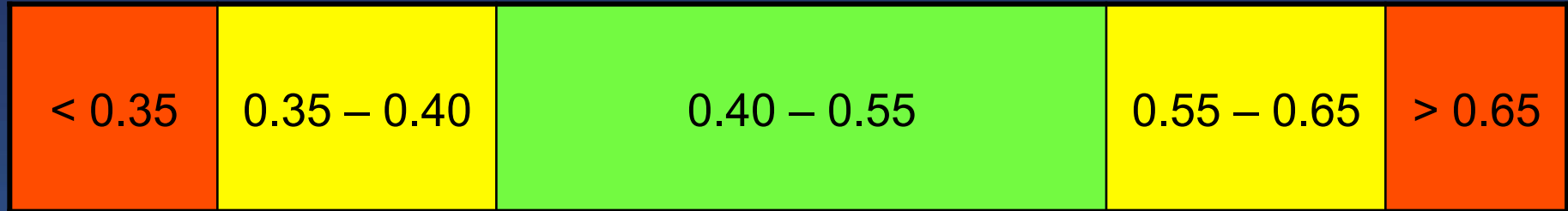
<b>Cementitious System</b>	<b>Suggested Dosage Range</b>
< 10% portland cement	not appropriate for Xypex Admix
plain portland cement	2 – 3 % by weight of PC content
< 20 % fly Ash or slag < 8 % silica fume	2 – 3 % by weight of PC only content
20 – 30 % fly ash 20 – 60 % slag	2 – 3 % by weight of total cementitious content
> 30 % fly ash > 60 % slag > 8 % silica fume	consult Xypex technical representative



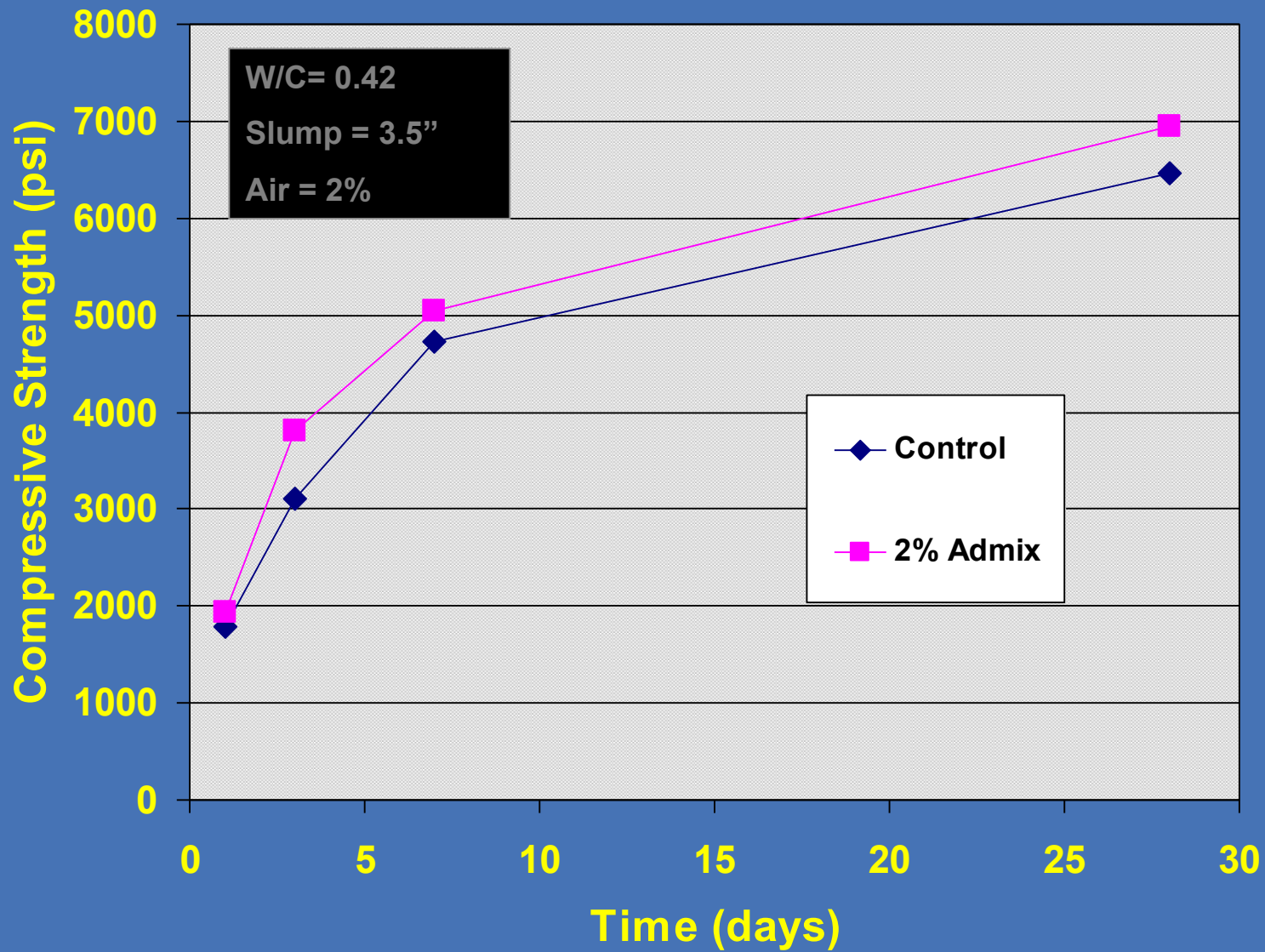
Can Xypex be used with other admixtures such as water reducer, superplasticizer, and air entrainer?



# What is the appropriate range of water / cement for concrete with Admix?



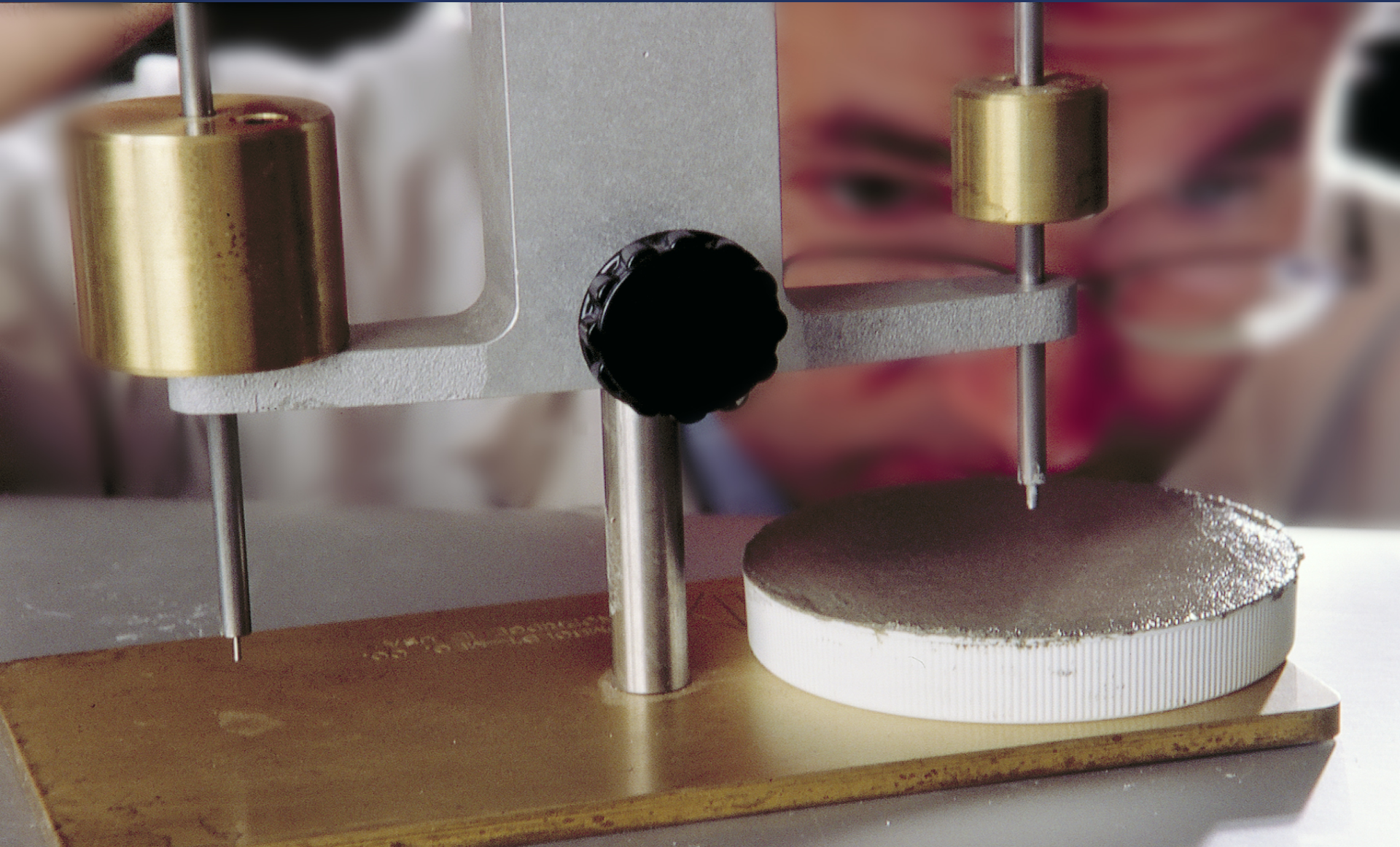
	Recommended w/c range for Admix
	Admix or coatings may be used contact Xypex technical representative
	Admix not appropriate – use coatings



*Los Gatos, CA Precast Parking Deck, 1992, Kleinfelder Laboratories, USA*



Is setting time of the concrete affected by the addition of the Admix?





Does Xypex affect the slump?



Slump

Minor differences (+/-) may be observed but are not “significant”

Slump Loss  
(with time)

Minor effects may theoretically occur but Xypex has not noted any actual occurrence

Is temperature of the concrete affected by the addition of the Admix?



Numerous tests have confirmed the ability of the Admix to prevent the flow or penetration of water under considerable hydrostatic pressure.

Sample Type	Sample I.D.	Permeability Coefficient ( x 10 <sup>-8</sup> m/s)	
		First Test	Second Test
<b>Control</b>	237	77.5	56.8
	<u>238</u>	<u>74.6</u>	<u>33.6</u>
	Ave	76.1	45.2
<b>3% Admix C1000</b>	235	1.1	1.4
	<u>236</u>	<u>2.6</u>	<u>1.2</u>
	Ave	1.9	1.3
<b>3% Admix C1000 (with sand)</b>	235	1.1	1.4
	<u>236</u>	<u>2.6</u>	<u>1.2</u>
	Ave	1.9	1.3





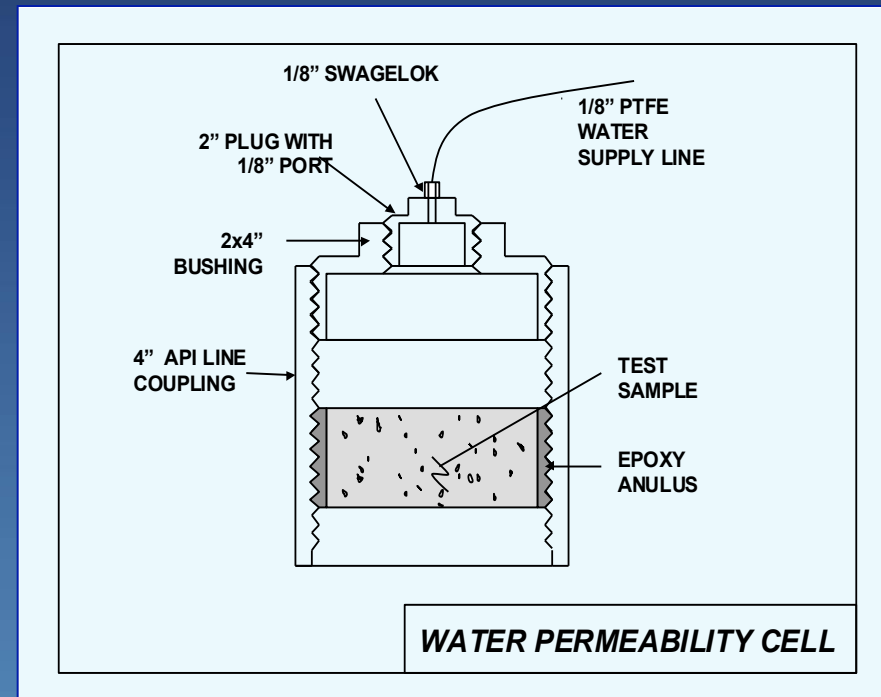
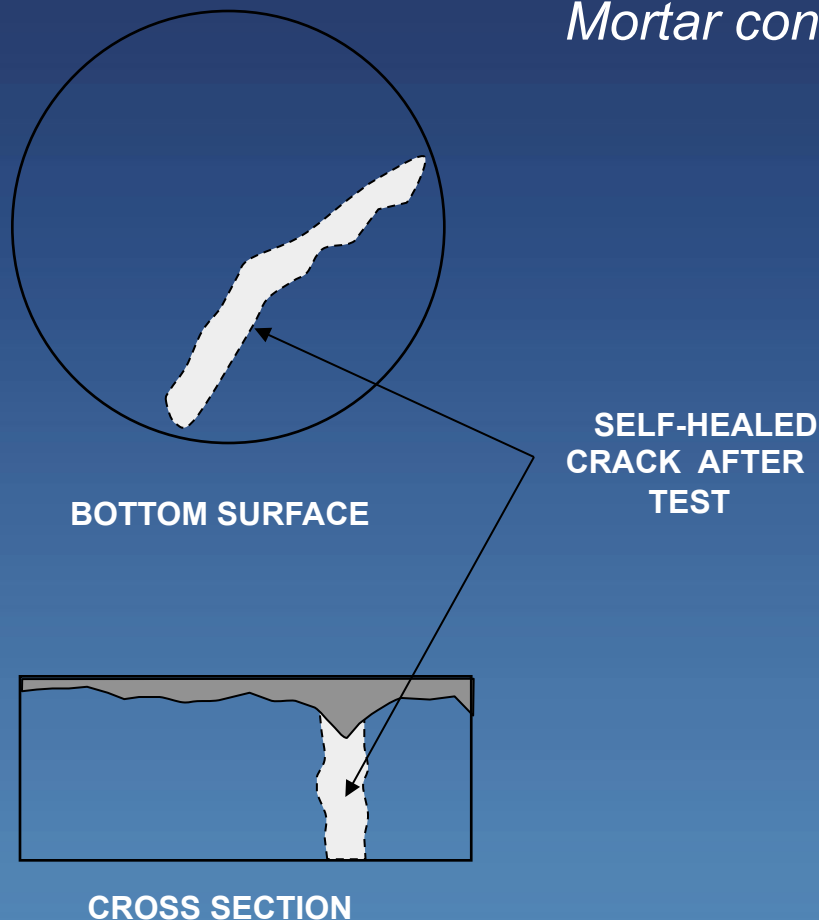
Bleed Tract Without  
Crystalline Waterproofing



Bleed Tract With  
Crystalline Waterproofing

# Does Admix provide self-healing similar to that of the Xypex coating products?

*Water Permeability Test on Cracked Mortar containing 3% Admix C-1000*





How does the Xypex treatment protect the concrete from chemical attack or exposure to a harsh aggressive environment?



# Does Xypex protects concrete exposed to acidic solutions?

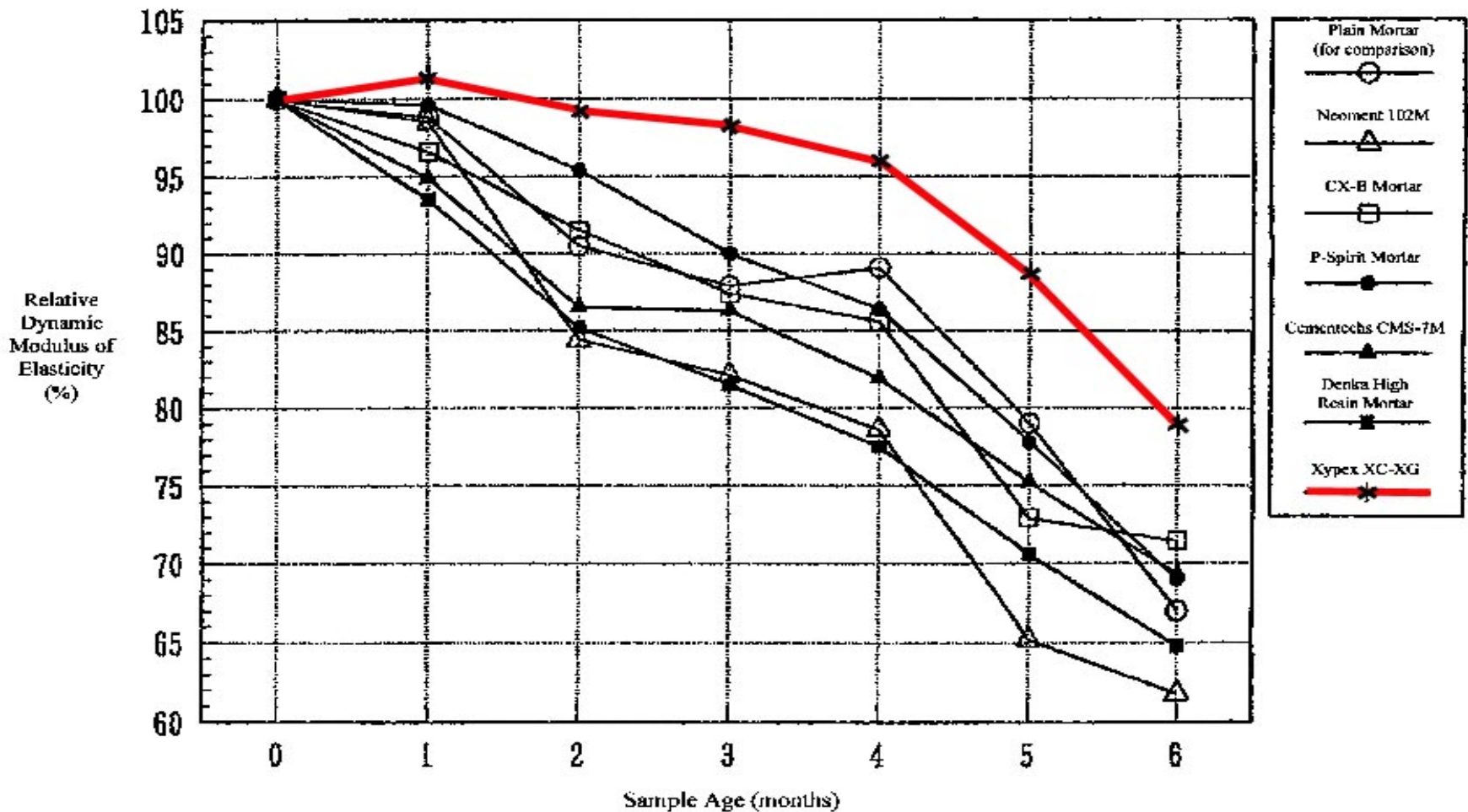
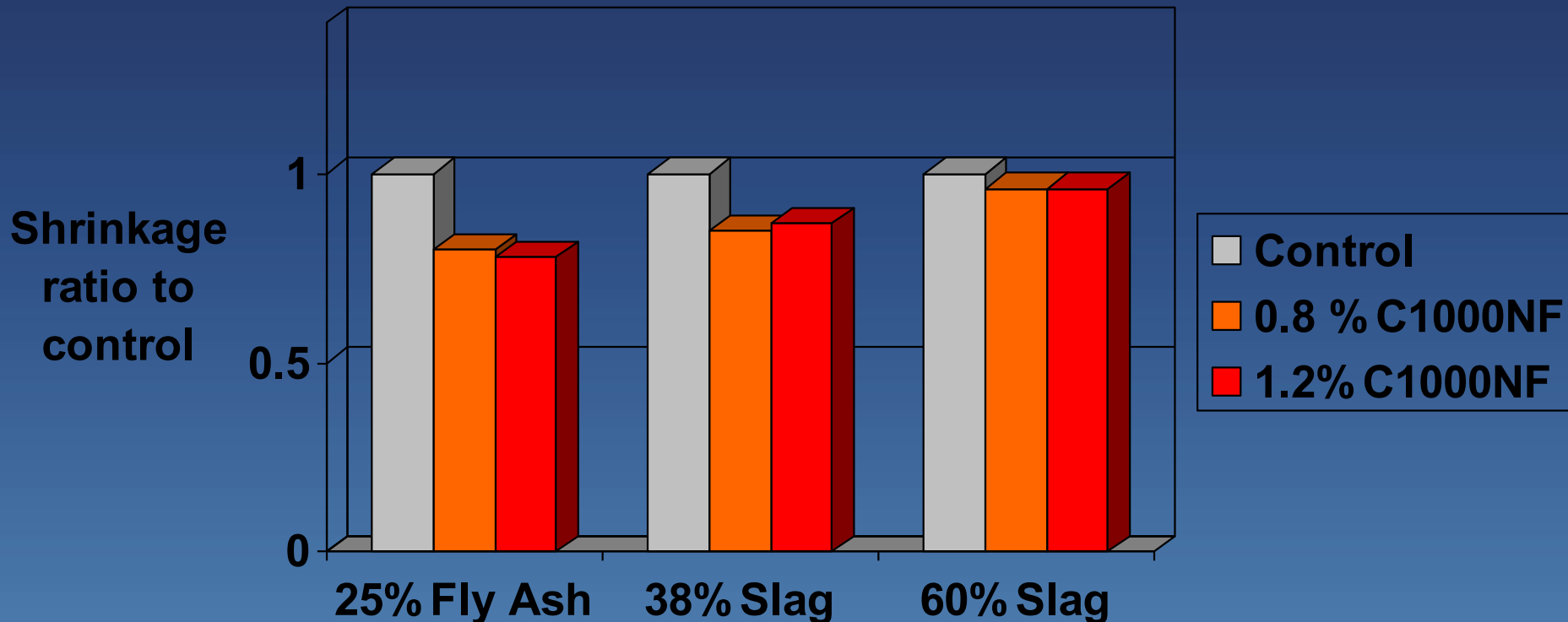


Figure 1. Relationship between the relative dynamic modulus of elasticity and the sample age for various types of mortar materials.



# Does Xypex Admix affect the amount of drying shrinkage cracking?



from ACCI, USNW, Xypex Australia May 2004



# Is Xypex Toxic?



# What Quality Control or Quality Assurance measures have been implemented in manufacturing and supplying of Xypex products?



# What key quality control measures are helpful to ensure the successful use of Xypex Admix?

<b>Designer/Contractor Checklist</b>	
<b>Xypex literature</b>	✓
<b>mix design</b>	✓
<b>dosage rates</b>	✓
<b>trial mixes</b>	✓
<b>reinforcing, joints, tie hole, repairs, etc.</b>	✓
<b>mix sequence</b>	✓
<b>placement methods</b>	✓
<b>Special setting time considerations such as finishing or rate of placement i.e. fluid pressure</b>	✓
<b>curing methods</b>	✓





# 102 University Avenue Palo Alto, Calif.







Auburn University  
Raybren General Contractors





## **St. Mary's Ga.**

Restraint Cracking leaks on April 9., 2010



## St. Mary's Ga.

Xypex Admixture- Restraint Cracks and leaking sealed, April 30, 2010.



# Xypex Admix Projects

- Thyssen Krupp- Alabama
- Georgia Power, Plant Sherer-Macon, Ga.
- Volkswagon Plant, Chattanooga, Tenn.
- Butts-Mehre, Athletic Facility, Athens, Ga.
- Auburn University, Auburn University
- Miami Dade Sewer Authority-Black Point Project (largest waste water project in US)
- Southern Co. Madison, Miss.
- Honda, Hyundai, Kia & Mercedes Plants
- National Maritime Museum-Mobile, Ala.
- Hilton Hotel, Atlanta
- Universal Studios, Legoland and Disney

# Xypex Approach to the Market

- Develop need for product through specification community.
- Partnering with Ready Mix Producer
- Product Support- Technology & Field
  - Independent Testing & Quality Control
  - Technical Support from design to project completion.