

## NSF 61 CERTIFICATION OF CONCRETE



May 06, 2016

# AGENDA

- Who is NSF and What Do They Do?
- NSF/ANSI Standard 61
- Application to Concrete Tanks
- Certification Process



# National Sanitation Foundation

- The organization started in 1944 as the “National Sanitation Foundation” (NSF)
- In 1990 they changed their name to “NSF International”, as services were expanded
- An independent accredited organization who develops standards and tests and certifies products and systems



# National Sanitation Foundation

- **Purpose:**

- *“The organization develops public health standards and certification programs that help protect the world’s food, water, consumer products and environment”*

- **Contact Information:**

NSF International

PO Box 130140

Anne Arbor, MI 48105

1-800-673-6275

[www.nsf.org](http://www.nsf.org)



# NSF Standards

- Standard vs certification?
- Specific products are tested by NSF International to see if they meet the limits of a particular “standard”
- If they are found to meet these limits, they may be able to obtain NSF certification



# NSF Standard 61

## • NSF/ANSI Standard 61, Drinking Water System Components

NSF/ANSI 61 addresses crucial aspects of drinking water system components such as whether contaminants that leach or migrate from the product/material into the drinking water are above acceptable levels in finished waters. Learn more about [NSF/ANSI 61](#).

## • What drinking water related items/products are covered?

- Protective barrier materials (cements, paints, coatings)
- Joining and sealing materials (gaskets, adhesives, lubricants)
- Mechanical devices (water meters, valves, filters)
- Pipes and related products (pipe, hose, fittings)
- Plumbing devices (faucets, drinking fountains)
- Process media (filter media, ion exchange resins)
- Non-metallic potable water materials



# NSF Certification

- NSF Certification is product specific
- Certification procedures vary by product but generally follows these 7 steps.
  - Application and information submission
  - Product evaluation
  - Product testing in lab
  - Manufacturing facility inspection, product confirmation, and product sampling
  - Test results review and acceptance
  - Contract signed and product listed

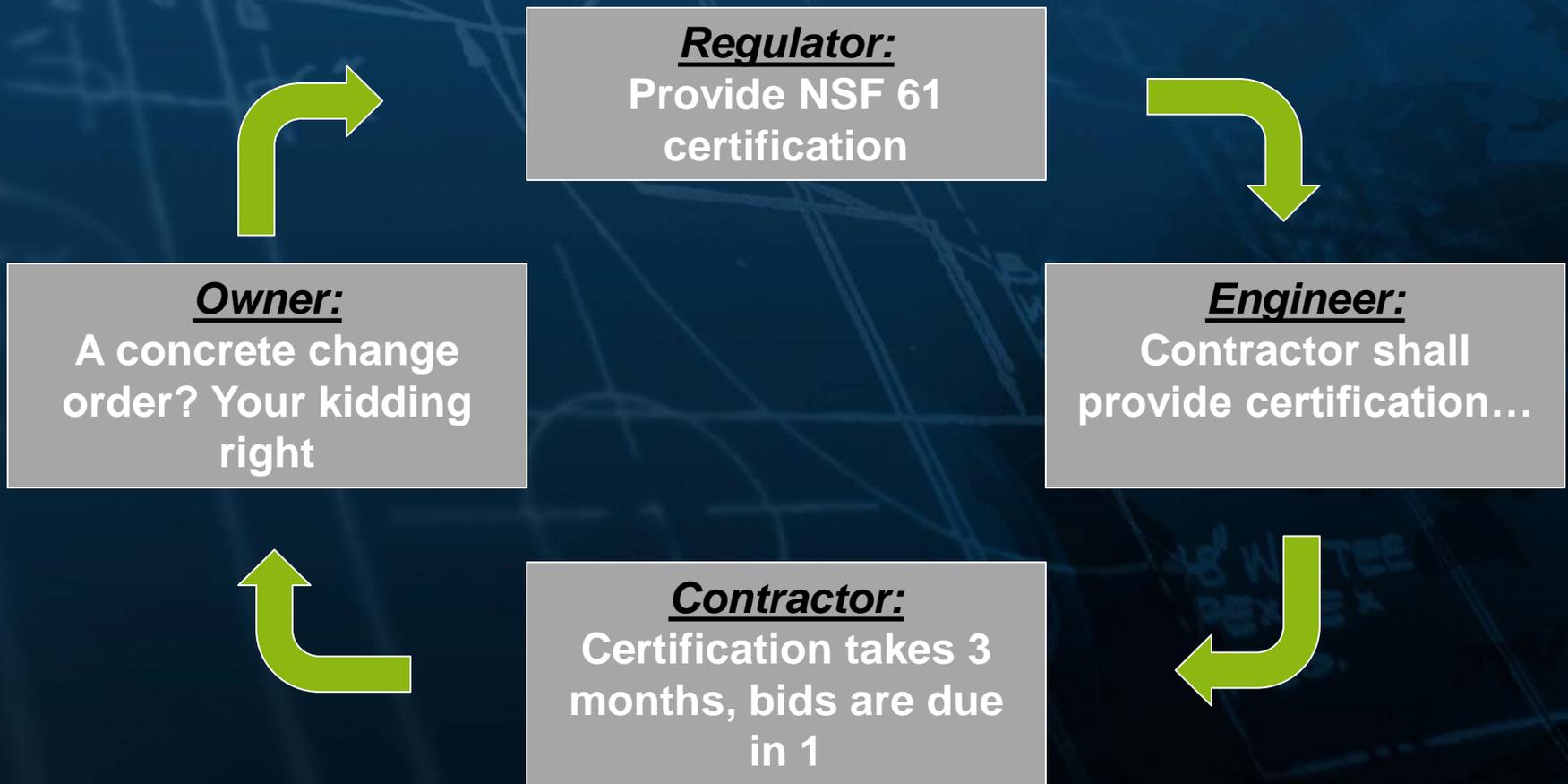


# The Concrete and NSF 61 Dilemma?

- **Most other products requiring certification are constructed/fabricated from the same ingredients every day... Ex. a rubber gasket from Manufacturer X**
- **Concrete consists of manufactured and natural ingredients**
  - Cement, aggregates, water and admixtures.
- **Concrete raw materials may change from project to project, and will vary from supplier to supplier**
- **If raw material sources change it becomes necessary to re-obtain an NSF 61 certification**



# Just make it a Contractor Requirement?



# What Should You Do for a New Project?

- **The answer will vary by project**
- **If you understand the requirement and the process you will have the tools to answer this question**
  - Who is the regulator, what is their policy?
  - What are the methods of certification
  - Timeline for this process
  - Costs of this process



# Regulating Agency?

- **For potable drinking water the “agency” is typically the State’s Health Department**
  - Oregon Health Authority (OHA)
  - Washington Department of Health (DOH)
  - Idaho Department of Health and Welfare (IDHW)
  - California Department of Public Health (CDPH)



# The Requirement?

- “Only materials designated for potable water service and meeting NSF Standard 61 shall be used in those elements of the construction that will come in contact with potable water”

- It is about interpretation

- No mention of concrete
- No mention of concrete mixes

- Protective barrier materials (cements, paints, coatings)
- Joining and sealing materials (gaskets, adhesives, lubricants)
- Mechanical devices (water meters, valves, filters)
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# State of California

- **California Department of Public Health, Drinking Water Program**
- **CCR Title 22, Section 64591, Changes effective 03/09/2008,**
- **“Chemicals leaching from materials in contact with drinking water.”**
- **Currently they recognize 4 certification approaches:**
  - Approved Components Method
  - Concrete Site Mix Evaluation Method
  - Facility Certification Method
  - Alternative Certification Method
- **AWWA California – Nevada Section website**



# Certification Methods & Process

- **Primary methods for getting concrete certified as meeting NSF 61**
  - Method 1 – Certify concrete cylinders
  - Method 2 – Certify components individually



# Method 1 – Certify Cylinders

- **Decide a few things before you begin the process**
  - Do you want to obtain certification during the design phase or during the construction phase
  - Who is responsible for obtaining certification - Engineer or Contractor?



# Method 1 – Certify Cylinders

|               |                            |  |
|---------------|----------------------------|--|
| <b>Step 1</b> | <b>Engineer</b>            | <b>Develop the CIP spec</b>                              |
| <b>Step 2</b> | <b>Engineer</b>            | <b>Contact batch plant</b>                               |
| <b>Step 3</b> | <b>Owner/Contractor</b>    | <b>Prequalify batch plants (3?)</b>                      |
| <b>Step 4</b> | <b>Batch Plant</b>         | <b>Cast &amp; cure cylinders</b>                         |
| <b>Step 5</b> | <b>Engineer/Contractor</b> | <b>Submit NSF Cert Application, Docs &amp; cylinders</b> |



# Method 1 – Certify Cylinders

|                |            |   |
|----------------|------------|---|
| <b>Step 6</b>  | <b>NSF</b> | <b>Product Evaluation</b>   |
| <b>Step 7</b>  | <b>NSF</b> | <b>Leach (soak) test cylinders</b>  |
| <b>Step 8</b>  | <b>NSF</b> | <b>Inspect manufacturing facility</b>                                       |
| <b>Step 9</b>  | <b>NSF</b> | <b>QAQC data &amp; test results</b>   |
| <b>Step 10</b> | <b>NSF</b> | <b>Sign contract, list product, provide Owner with certification letter</b> |



# Method 1 – Certify Cylinders

## ● Timeline:

- Final specification varies
- Batch Plant selection varies
- Cast and cure cylinders 1 – 2 months
- NSF Certification process 3 – 4 months
- Total = 4 – 6 months, not including engineering and selection

## ● Cost:

- NSF Certification process \$10,000-15,000 per test (i.e. batch plant)



# Method 2 – Certify Individual Ingredients

- Method 1 involved casting cylinders and getting those certified
- Method 2 applies the same process but rather than casting cylinders of the “approved” mix you will need to submit, test and get certifications for each ingredient individually



# Method 2 – Certify Individual Ingredients

|                 |   |
|-----------------|---|
| <b>Step 1-4</b> | <b>Same as Method 1</b>   |
| <b>Step 5</b>   | <b>Submit NSF Cert Application, Docs &amp; samples of materials</b>         |
| <b>Step 6</b>   | <b>Product Evaluation</b>   |
| <b>Step 7</b>   | <b>Leach (soak) test materials</b>  |
| <b>Step 8</b>   | <b>Inspect manufacturing facility</b>                                       |
| <b>Step 9</b>   | <b>QAQC data &amp; test results</b>   |
| <b>Step 10</b>  | <b>Sign contract, list product, provide Owner with certification letter</b> |



# Method 2 – Certify Individual Results

## • Timeline:

- Method 1 was 4 – 6 months for 1 set of cylinders
- Now repeat that process for all mix ingredients
  - Cement, SCMs, aggregates, assume admixtures already done by manufacturer (minimum of 3 tests)
- Concurrent                    4 – 6 months
- Sequential                    12 – 18 months!

## • Cost:

- \$10,000 - 15,000 per test (i.e. per ingredient)
- x3 tests or \$30,000 - \$45,000 ... but that is only for one batch plant's mix, what if you want the option of multiple batch plans



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# QUESTIONS?

# Thank You



# NSF 61 and Fly Ash

- **By-product of pulverized coal burning at power plants**
- **Typically stored in large drying lagoons**
- **December 2008 pond dam failure, Kingston PP Tennessee**
- **EPA responded by reviewing fly ash – classify as hazardous**
  - The purpose was to trigger better regulation on fly ash disposal... management of drying lagoons
- **EPA decided to not classify as hazardous, 12/09/14**

