Field Test at Maine Yankee Independent Spent Fuel Storage

SAND2017-5513PE

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Outline

- Background
- Experiment
- Off Normal Blockage Analysis

Purpose

- Gather information about chloride deposition within the Vertical Concrete Canister (VCC) air circulation system (also known as the heat removal system)
- Determine susceptibility of canisters to Chloride Induced Stress Corrosion Cracking (CISCC) for aging management
- Provide a correlation between a real world conditions and experimental lab data

Problem

Due to the delay in removing spent fuel from reactor sites

- Commercial spent nuclear fuel will require storage for longer time periods at the utility sites than originally anticipated.
- Resulted in re-licensing of the dry cask storage systems used at many sites
- Requires aging management programs to be developed as part of the re-licensing process.

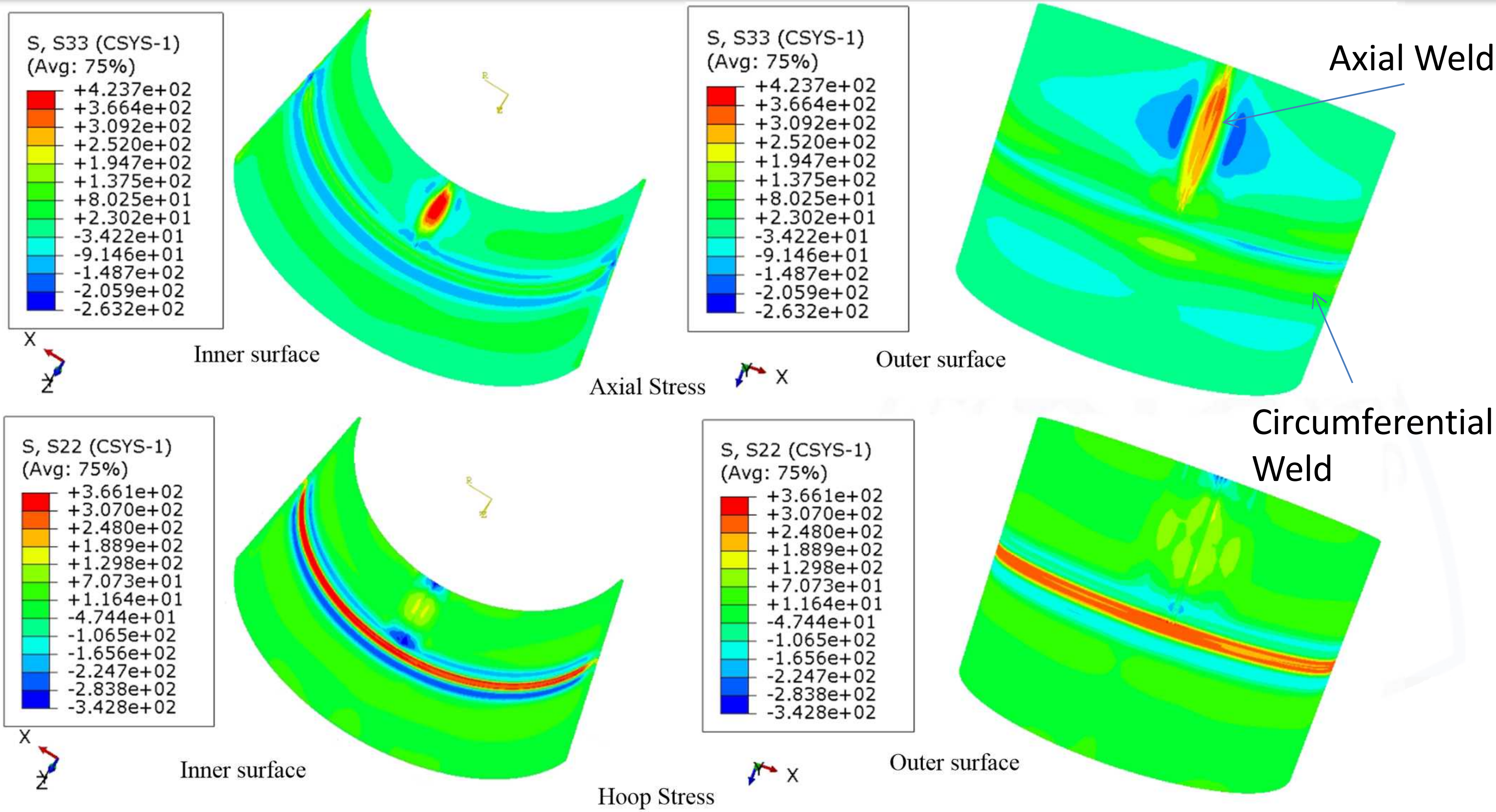
Causes of CISCC

Most likely aging management damage mechanism of the stainless steel canister is Chloride Induced Stress Corrosion Cracking (CISCC)

This occurs when the following three elements are present:

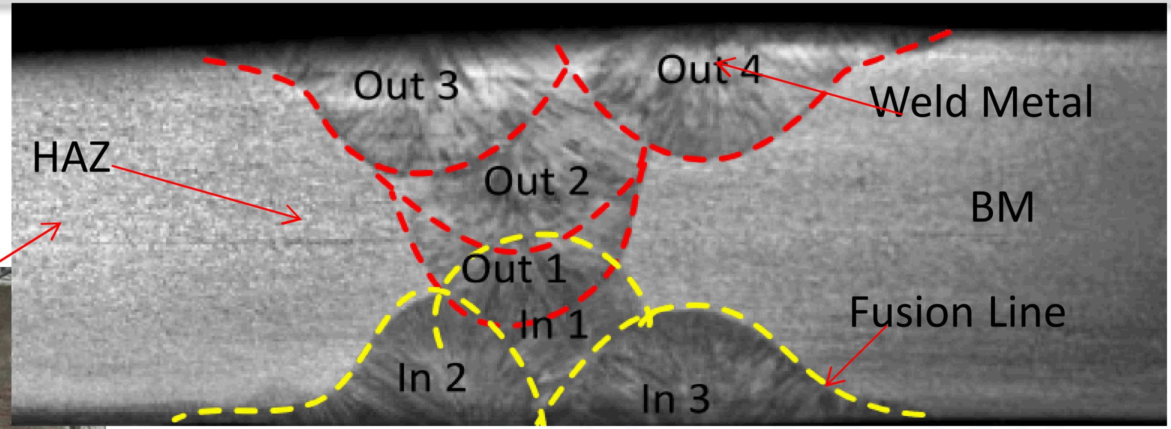
- **Tensile stress**
  - The elevated tensile stress is caused by residual welding stress.
- **Susceptible materials**
  - The susceptible material occurs in the Heat Affected Zone (HAZ) of the austenitic stainless steel used in the canister shell during the welding process.
- **Environment**.
  - Deliquescent condition
    - humid conditions
    - chlorides deposited on the surface of the canister
      - surface chlorides could form brine on the canister surface under the right field conditions
  - Another environmental variable is temperature which has to be in an appropriate range in this area to sustain this condition.

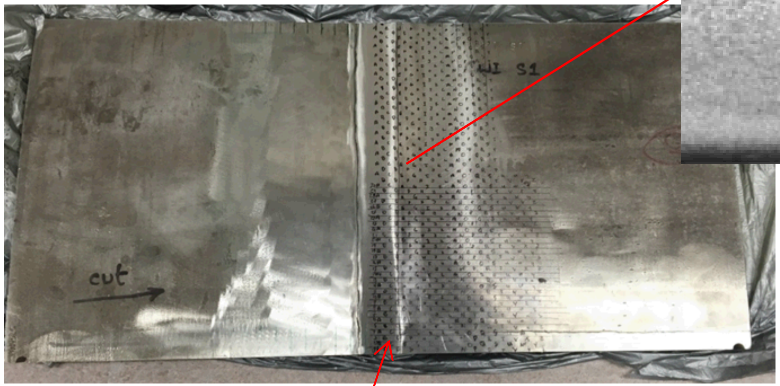
Overall Residual Stress Contour Distribution

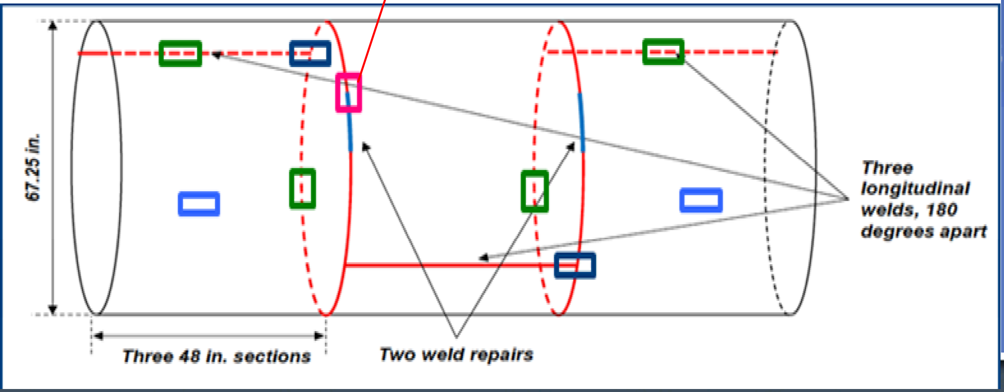


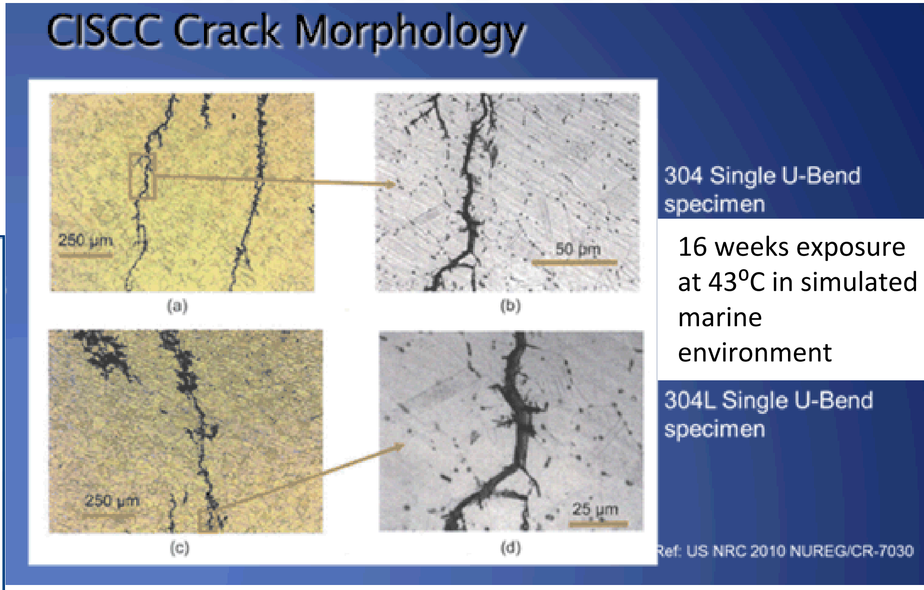
Weld Bead Morphology and CISCC Example

Circumferential weld taken from Sandia Mockup Macrograph









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Canister Surface Environment

Environmental Requirements for SCC:

- <u>Presence of an aqueous solution</u>

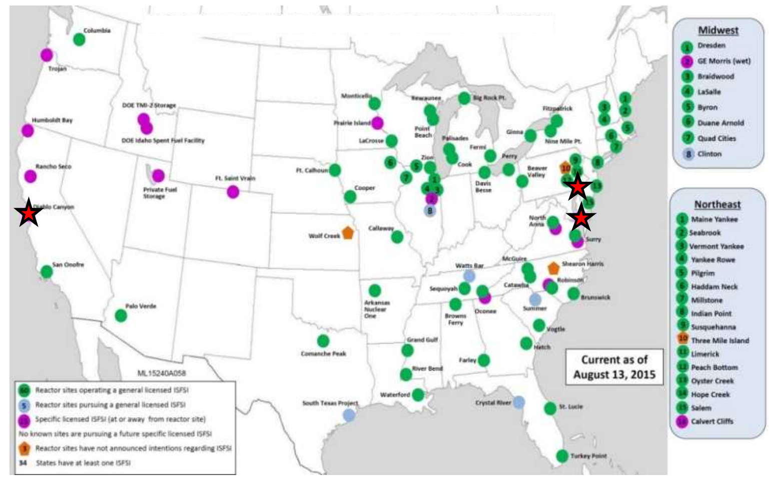
  A persistent aqueous solution can only form by deliquescence of salts deposited on canister surfaces by air flowing through the passively-ventilated overpacks

  <u>Chemically aggressive (chloride-rich) environment</u>

  - Many ISFSIs are at coastal sites. Deposition of chloride-rich sea-salts has been observed
  - EPRI sampling program: Evaluated canister dusts at three near-marine ISFSIs.
    - Calvert Cliffs, MD (June, 2012)
    - Hope Creek, NJ (Dec, 2013)
    - Diablo Canyon, CA (Jan, 2014)

EPRI sampling program confirmed that corrosive chloride-rich sea-salts have been found on SNF storage canister surfaces.

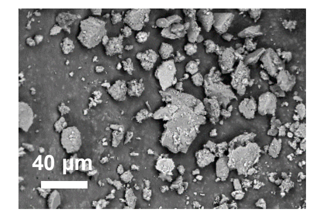
U.S. Spent Nuclear Fuel Independent Storage Installations (ISFSIs)



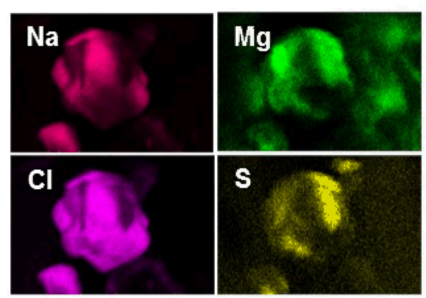
Sampling Locations

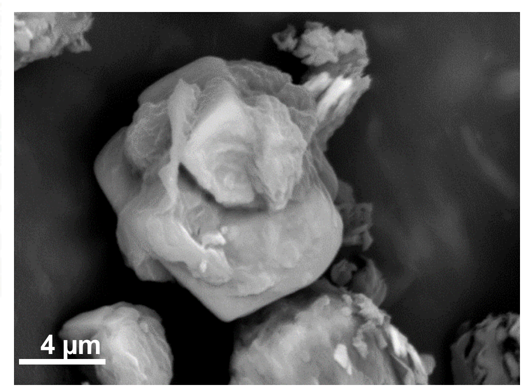
Diablo Canyon ISFSI

Collected dusts



Seasalt particles



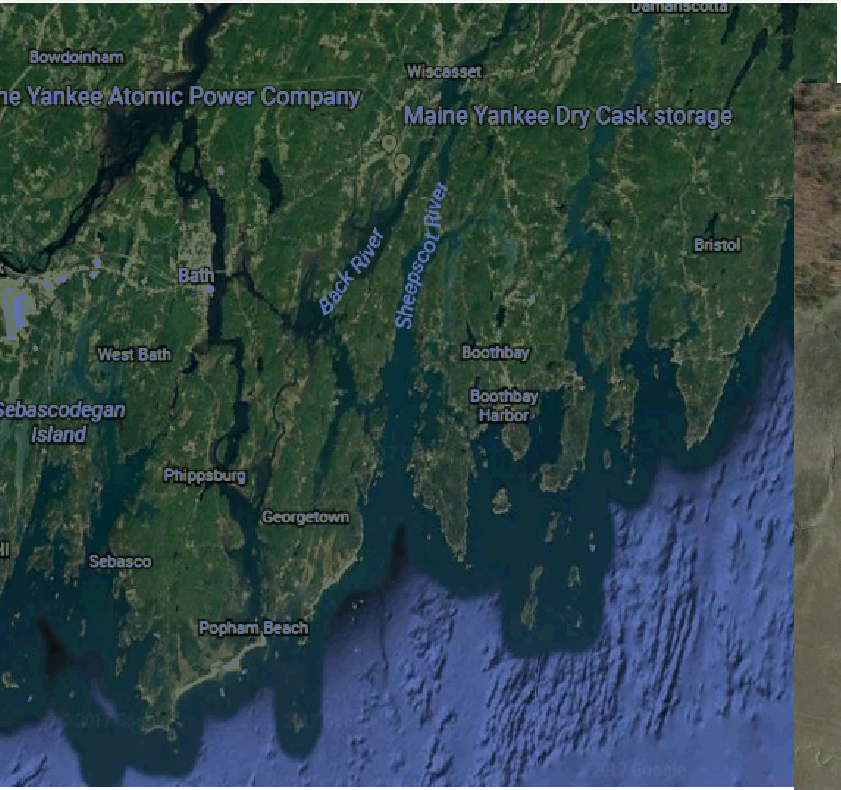


Choosing a Site

The Maine Yankee site was a location of interest to CSM because it has been conducting atmospheric monitoring for several years

- Can provide some correlating data to help understand the natural condition of this site compared to other ISFSI locations
- Help correlate what is measured on sample surfaces with the levels measured on the air filters
- The data indicates that chloride levels in the atmosphere are fairly low compared to seaside sites

Location


Bowdoinham
Wiscasset
ne Yankee Atomic Power Company
Maine Yankee Dry Cask storage
Back River
Sheepscot River
Bristol
Bath
West Bath
Boothbay
Boothbay Harbor
Sebascodegan Island
Phippsburg
Georgetown
Sebasco
Popham Beach


Maine Yankee Dry Cask storage
Little Oak Island
Back River
Google

Experimental Setup

Stainless steel specimens of two different sizes will be placed in the in the VCC.

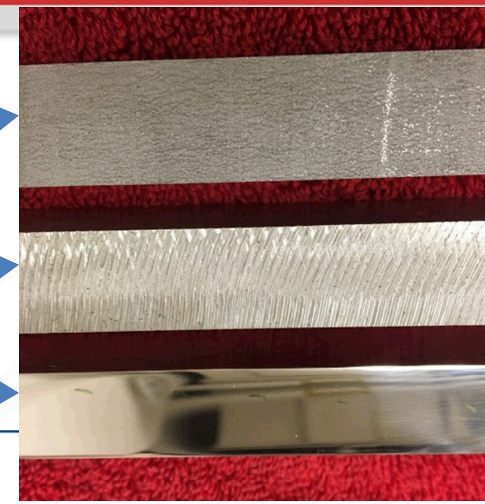
- Samples are dual certified Type 304/304L stainless steel base material welded with Type 308 filler material and have been harvested from a mockup fuel canister located at Sandia Labs and smaller specimens have been produced at CSM
  - Same type of stainless steel used in the Maine Yankee canister
  - The population of specimens will represent all regions of the canister including the base metal, the HAZ and the canister welds.
- They will be held in a 4 point bend tensioner,
  - Create tensile stress necessary for CISCC conditions
  - Made of Type 316 stainless steel
    - Coated with an epoxy coating, (similar to the coating used on VCC steel parts)
    - An anti-seize lubricant will also be used on the threaded components of the tensioner.

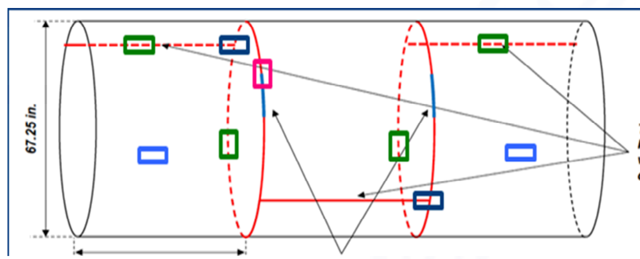
Specimens

- Specimens 304L, 304H, Mockup
  - 304L, 304H, 5/8” thick
    - As received
      - Mill Finish
      - 36 grit Hard Grinding Disc
      - Polished
  - Mockup Specimen

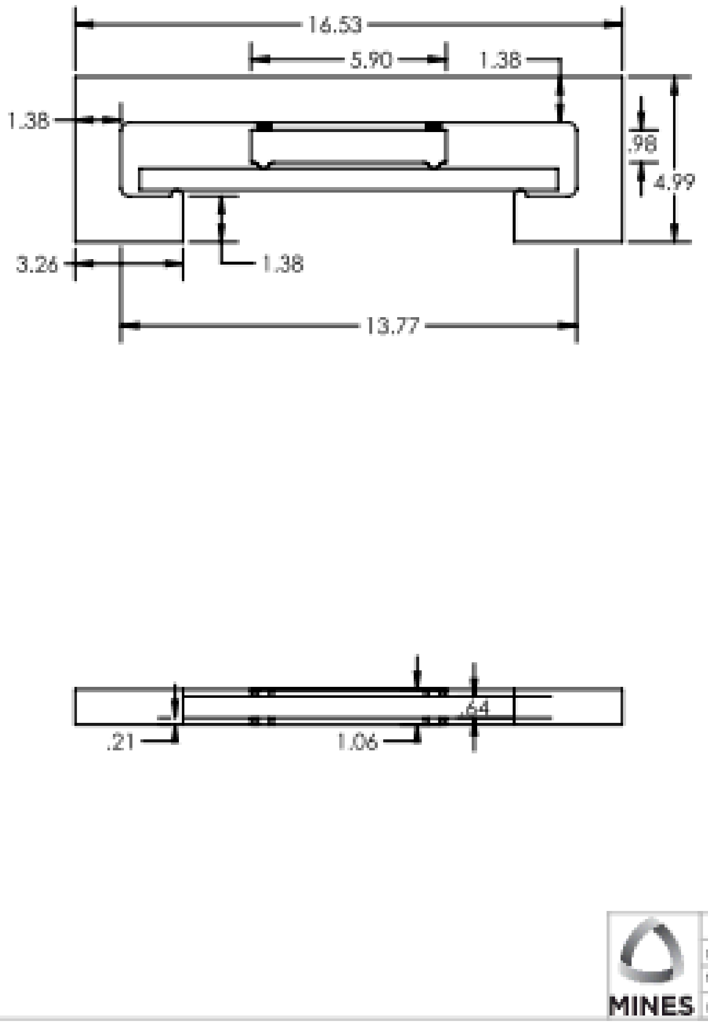
    Type 304L Base Material

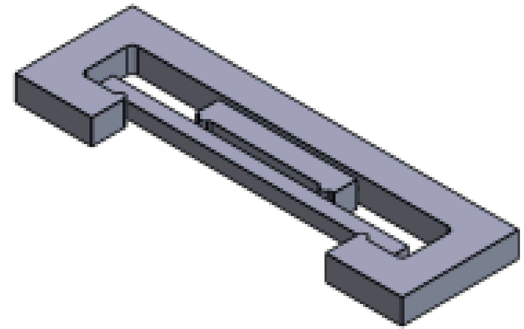
    Type 308 Weld Filler
    - Circumferential Weld
    - Longitudinal weld
  - 304L, ¼” thick
    - As received
      - Mill Finish
      - 36 grit sanding disc
      - Hard grinding disc
      - Polished
      - Welded (Type 308 Filler)



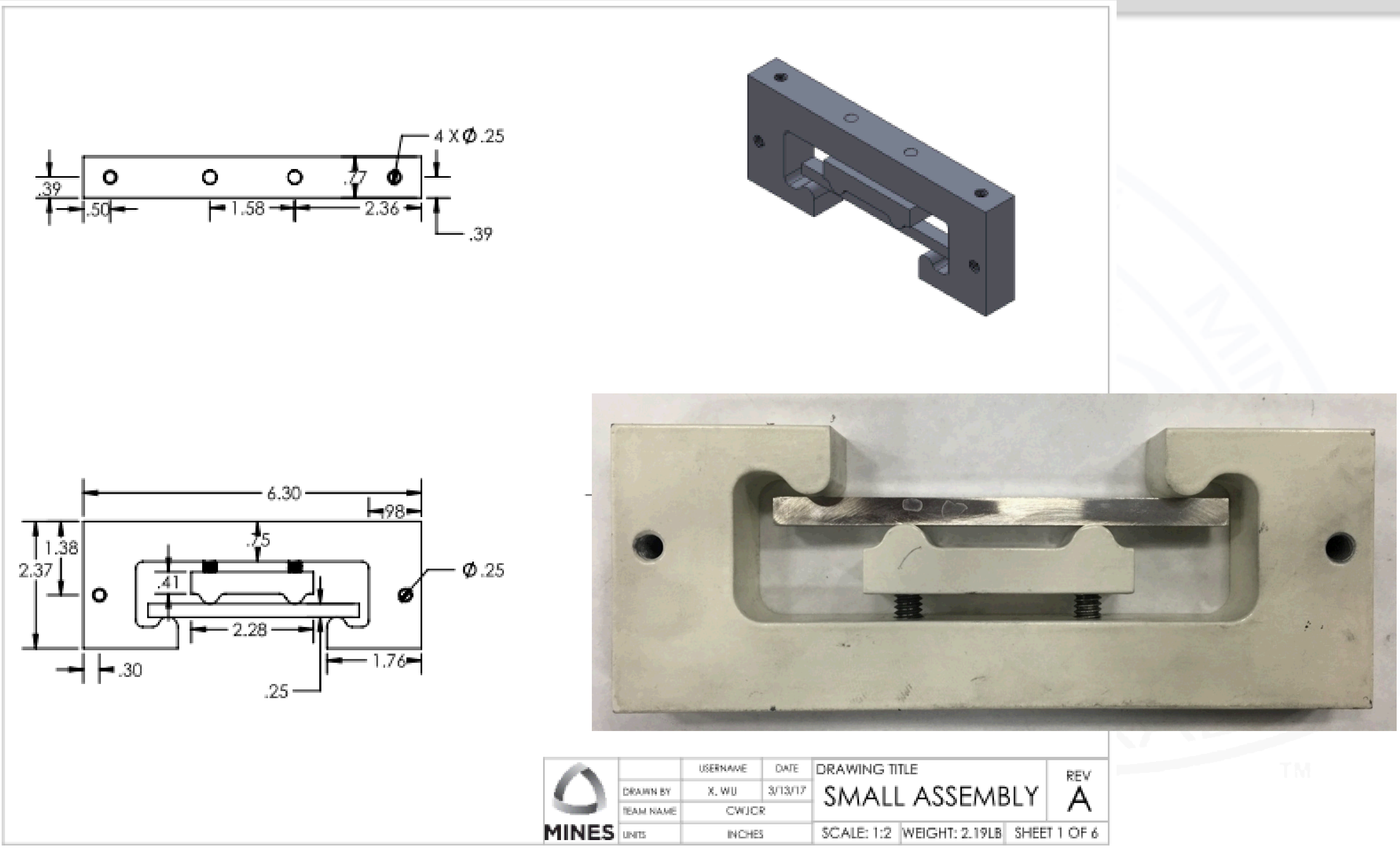


Large Four Point Bend Fixture

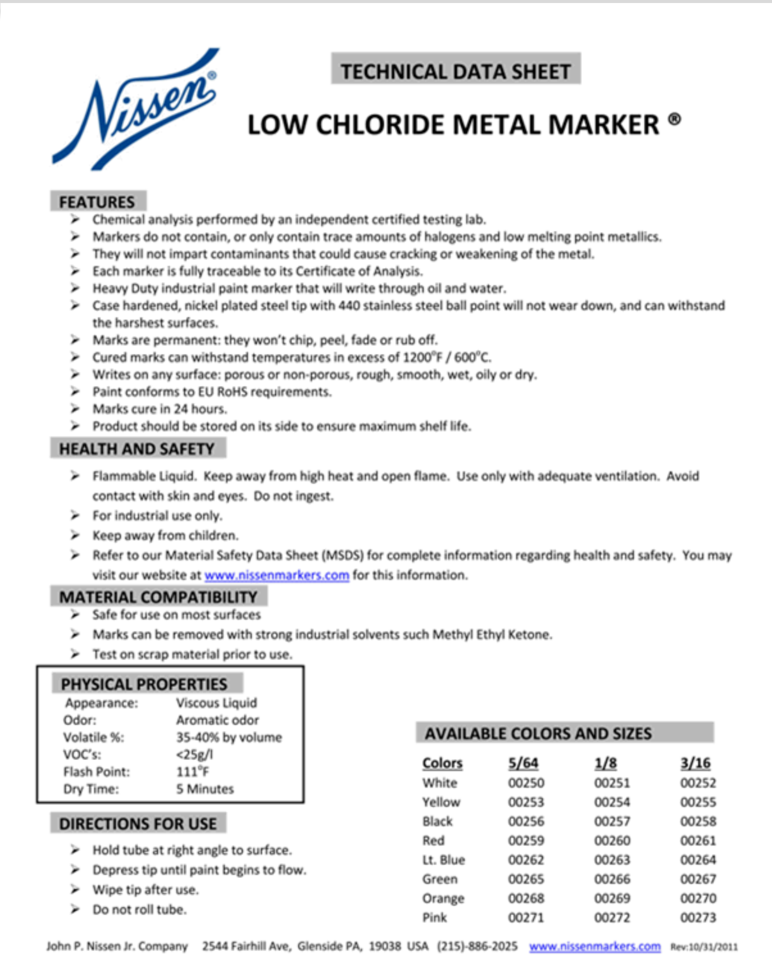




Small Four Point Bend Fixture



DIC Marking



TECHNICAL DATA SHEET

Nissen®

LOW CHLORIDE METAL MARKER ®

FEATURES

- Chemical analysis performed by an independent certified testing lab.
- Markers do not contain, or only contain trace amounts of halogens and low melting point metallics.
- They will not impart contaminants that could cause cracking or weakening of the metal.
- Each marker is fully traceable to its Certificate of Analysis.
- Heavy Duty industrial paint marker that will write through oil and water.
- Case hardened, nickel plated steel tip with 440 stainless steel ball point will not wear down, and can withstand the harshest surfaces.
- Marks are permanent: they won't chip, peel, fade or rub off.
- Cured marks can withstand temperatures in excess of 1200°F / 600°C.
- Writes on any surface: porous or non-porous, rough, smooth, wet, oily or dry.
- Paint conforms to EU RoHS requirements.
- Marks cure in 24 hours.
- Product should be stored on its side to ensure maximum shelf life.

HEALTH AND SAFETY

- Flammable Liquid. Keep away from high heat and open flame. Use only with adequate ventilation. Avoid contact with skin and eyes. Do not ingest.
- For industrial use only.
- Keep away from children.
- Refer to our Material Safety Data Sheet (MSDS) for complete information regarding health and safety. You may visit our website at www.nissenmarkers.com for this information.

MATERIAL COMPATIBILITY

- Safe for use on most surfaces
- Marks can be removed with strong industrial solvents such Methyl Ethyl Ketone.
- Test on scrap material prior to use.

PHYSICAL PROPERTIES

Appearance:	Viscous Liquid
Odor:	Aromatic odor
Volatile %:	35-40% by volume
VOC's:	<25g/l
Flash Point:	111°F
Dry Time:	5 Minutes

DIRECTIONS FOR USE

- Hold tube at right angle to surface.
- Depress tip until paint begins to flow.
- Wipe tip after use.
- Do not roll tube.

AVAILABLE COLORS AND SIZES

Colors	5/64	1/8	3/16
White	00250	00251	00252
Yellow	00253	00254	00255
Black	00256	00257	00258
Red	00259	00260	00261
Lt. Blue	00262	00263	00264
Green	00265	00266	00267
Orange	00268	00269	00270
Pink	00271	00272	00273

John P. Nissen Jr. Company 2544 Fairhill Ave, Glenside PA, 19038 USA (215)-886-2025 www.nissenmarkers.com Rev:10/31/2011

On one side of the specimen are paint marks for the purpose of using digital image correlation to determine deflection of the assembly before and after tensioning, to simulate weld residual stress.

Frame and Specimen Coating

Product Data Sheet

Keeler & Long

PPG High Performance Coatings

Keeler & Long/PPG
856 Echo Lake Road
Watertown, CT 06795
1-800-238-8996

Kolor-Poxy™ Primer
KL3200 Series

Product Information

Product Code:	KL3200 White Part A
Product Type:	Polyamide-Epoxy
Suggested Use:	Use where a high build primer/topcoat is required that provides abrasion, impact and chemical resistance when applied to steel and concrete surfaces exposed to a wide range of conditions. May be used in Nuclear Coating Service areas Level II, balance of plant, and certain Level III areas.
Not Recommended:	Immersion in strong solvents.
Compatible Topcoats:	Acrylic Enamels, Hydro-Poxy™ Enamels, Kolor-Poxy™ Primers and Enamels, Poly Silicone Enamels

Product Description

Color:	White and light colors, Red Oxide
Gloss 60°:	Flat
VOC:	2.56 lbs./gal. (302 g/L) *
Method:	Calculated (mixed)
Weight/Gallon:	13.6 +/- 0.5 lbs./gal. (mixed) *
In Service Heat Limitations:	250°F (121°C) maximum, dry heat.
Flash Point:	KL3200B Part B 123°F (51°C)
Package:	KL3200 Part A is available in short filled gallon and five gallon containers.
Percent Solids by Volume:	66.2% +/- 3.0% (mixed) *
Percent Solids by Weight:	81.5% +/- 3.0% (mixed) *

Application Data

Substrate:	Ferrous metal or masonry
Substrate Preparation:	The service life of the coating is directly related to the surface preparation. The surface to be coated must be properly prepared, dry, clean and free of contamination.
	Minimum surface preparation is SSPC-SP6 (NACE #3) Commercial Blast Cleaning for ferrous substrates.
	Stabilizers on the surface of hot dipped galvanized steel must be removed by either brush blasting, sanding or chemical treatment.
	Near White Metal Blast Cleaning per SSPC SP10 (NACE #2) is minimum surface preparation for immersion service.
Basecoat:	Self priming when used on recommended substrates.
Application Method:	Apply by spray, brush or roller application.
	Air Spray: DeVilbiss MBC gun, 704 or 777 air cap with "E" tip and needle or equivalent equipment. Atomizing pressure 30-60 psi.
	Airless Spray: Equipment capable of maintaining a minimum of 2300 psi at the tip without surge. 0.015" (0.38 mm) to 0.019" (0.48 mm) orifice.
	Brush: Use a high quality natural bristle brush.
	Roller: Use a 3/8" nap polyester-nylon roller cover with a solvent resistant core.
Parts Base by Volume:	4 parts KL3200 Part A
Parts Catalyst by Volume:	1 part KL3200B Part B
Thinner Code & Percent:	Thin up to 5% by volume with KL3700 as needed for application.

Lubricant

NEVER·SEEZ®
Anti-Seize & Lubricating Compound
TECHNICAL DATA SHEET

Pure Nickel Special, Nuclear Grade

Product Description

Never-Seez® Pure Nickel Special, Nuclear Grade is specially tested and certified pure for use in nuclear power plants. Each production lot of Nuclear Grade Never-Seez is tested for contaminants of sulfur, halogens and low-melt metals and each container is labeled with the lot number that certifies purity.

Pure Nickel Special, Nuclear Grade is a superior, high temperature anti-seize and extreme pressure lubricant containing flake particles of pure nickel, graphite and other additives in a special grease carrier found to enhance anti-seize performance.

Recommended for use when applications prohibit the presence of copper, especially when resistance to corrosive acidic and caustic solutions is required.

Product Benefits

- Excellent heat dispersing qualities
- Minimizes corrosion
- Prevents seizure at high temperatures
- Resists galvanic action between dissimilar metals
- Enables fast disassembly-even after high temperature exposure
- Prevents galling on steel to stainless steel, titanium, magnesium and other hard metals
- Resists alkaline solutions, most chemical and acid vapors, road salt, steam, salt water, ionized water

Product Applications

- Fittings, fasteners exposed to high temperatures in steel mills, power plants, nuclear plants
- Stainless steel pipe fittings, flanges, pump fittings
- Fasteners in exhaust manifolds and boilers
- Steam generators
- Assembly of dissimilar metals

Limitations

- Never-Seez® Pure Nickel Special, Nuclear Grade is not recommended for high speed bearing applications. Never-Seez Red Bearing Lubricant is suggested for these applications.
- In applications where indirect food contact is possible, use USDA approved Never-Seez® White Food Grade.

Technical Specifications

Color		Silver Gray	
Temperature Range, °F (°C)		-297°F to 2400°F (-183°C to 1316°C)	
Thickener Type		Lithium Soap	
Particle Size, mil (microns)		2 maximum (50 m)	
Density, (g/cm3)		1.22 to 1.28	
		ASTM Test Method	
Flash Point, °F (°C)		>300°F (>149°C)	D-92
Copper Corrosion Test@ 212°F (100°C), 24 hrs.		No corrosion	D-130
Worked Penetration, 60 strokes @25°F (25°C)		260-310	D-217
NLGI Grade		1/2	D-217
Dropping Point, °F (°C)		360°F (182°C)	D-566
Water Washout, % loss @ 100°F		<2	D-1264
@ 175°F		<5	
Coefficient of Friction @ 167°F (75°C), Four Ball		0.092	D-2266
Torque Coefficient, k factor		0.158	
Four Ball EP	Load Wear Index	68	D-2596
	Last Non-seizure Load (scar)	79 kgf (0.59 mm)	
	Last Seizure Load (scar)	250 kgf (1.46 mm)	
	Weld Load	315 kgf	

Specifications: G.E. Atomic Equipment Division, #D50YP12; G.E. D6Y6; MIL-A-907; Ford ESE-M12A4-A; Ford WSD-M13P8-A1; Boeing BAC 5008 Type 7-3; U.T. Pratt & Whitney PWA 36053-1; G.E. Engine A50-TF198 Class A; Garrett Engine PCS5721.

Ingredients: A special, high-quality grease with graphite, pure nickel, and other additives. Contains no molybdenum disulfide, lead, or mercury except as trace elements.

Shelf Life: Never-Seez® Pure Nickel Special, Nuclear Grade compound does not deteriorate with age when stored unopened at temperatures below 120°F (49°C). Quality and performance are guaranteed for five years from the date of manufacture on unopened containers.

How Never-Seez Pure Nickel Special, Nuclear Grade Affects Torque:

Compared to unlubricated fasteners, the use of Never-Seez Pure Nickel Special, Nuclear Grade can be viewed 2 ways:

(1) It provides up to 15% MORE clamping force when applying the SAME amount of torque!

(2) It provides the SAME clamping force when applying up to 15% LESS torque!

IMPORTANT!

- In order to best represent typical torque reduction values, Bostik references a "K-Factor" for unlubricated carbon steel fasteners of 0.185.
- Proper torque is critical and, if not clearly understood, users may over-torque their fasteners which may lead to costly damage. BOSTIK is not liable for any damages incurred. Refer to the Bostik standard warranty for details.

Use in accordance with Material Safety Data Sheet.

Ordering Information:

NEVER-SEEZ® PURE NICKEL SPECIAL, NUCLEAR GRADE

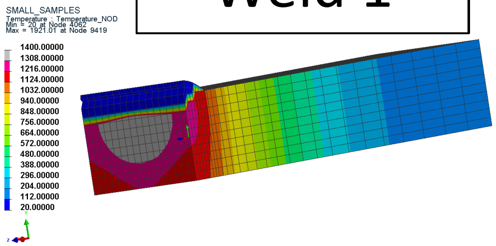
STOCK NUMBER	DESCRIPTION	SIZE
NG-165	Flat Top	1 lb.
NG-8	Flat Top	8 lb.
NGBT-8	Brush Top	8 oz.
NGBT-16	Brush Top	1 lb.

Maximum Specification Limits:

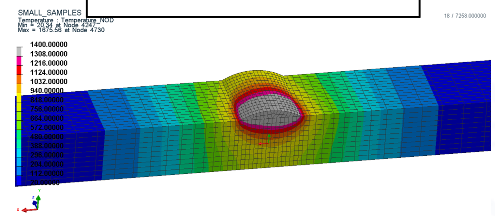
Arsenic, As	<50 ppm
Antimony, Sb	<50 ppm
Bismuth, Bi	<50 ppm
Cadmium, Cd	<50 ppm
Gallium, Ga	<50 ppm
Indium, In	<50 ppm
Lead, Pb	<10 ppm
Mercury, Hg	<1 ppm
Silver, Ag	<50 ppm
Tin, Sn	<50 ppm
Zinc, Zn	<50ppm
Total Chlorine	<200 ppm
Total Nitrate	<200 ppm
Total Sulfur	<200 ppm
Total Phosphorous	<200 ppm

Sysweld Modeling

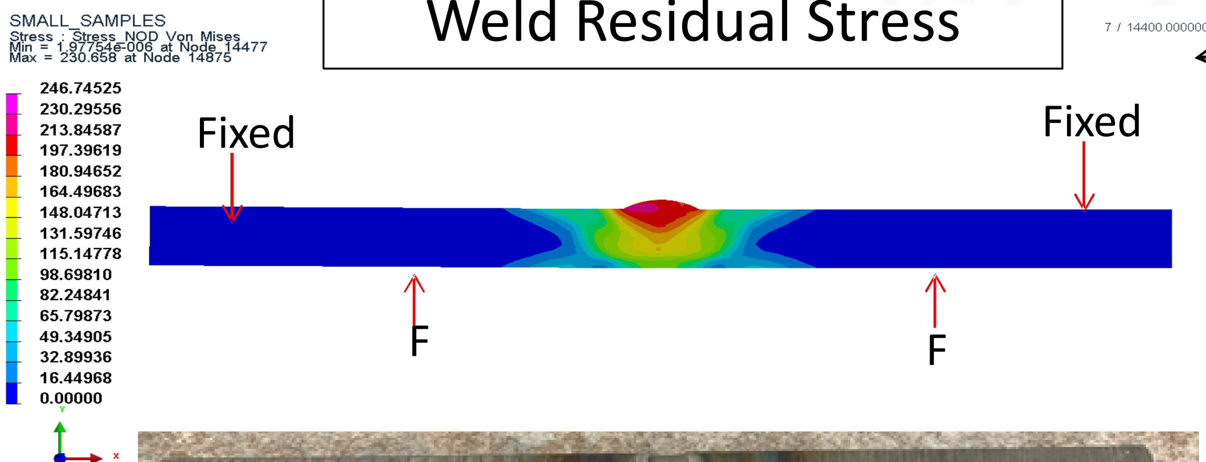
Weld 1



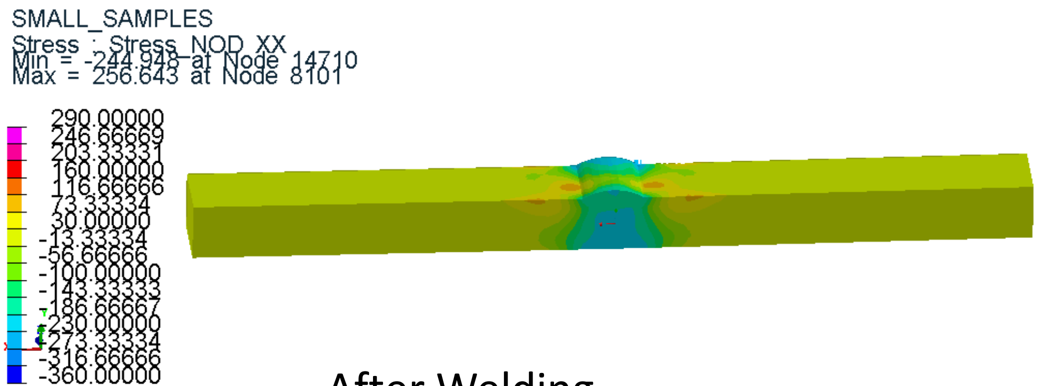
Weld 2



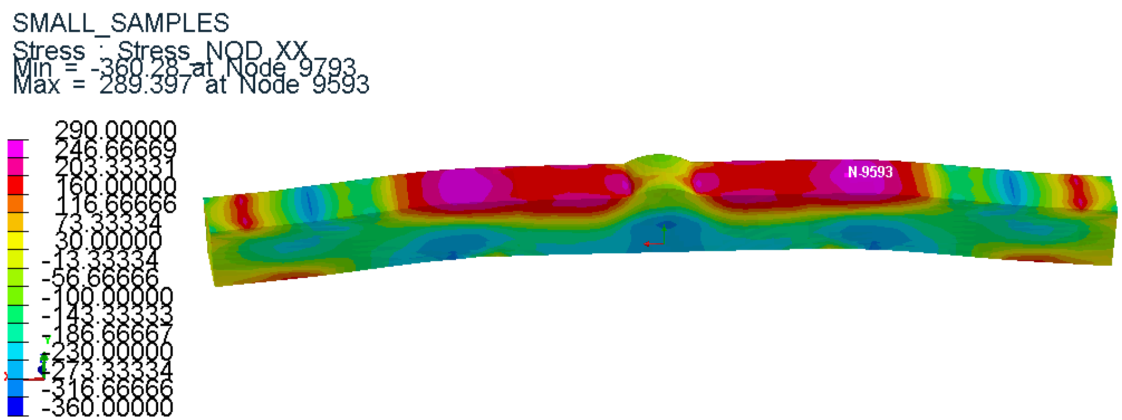
Four Point Bend Load with Weld Residual Stress



Loading Assumptions



After Welding

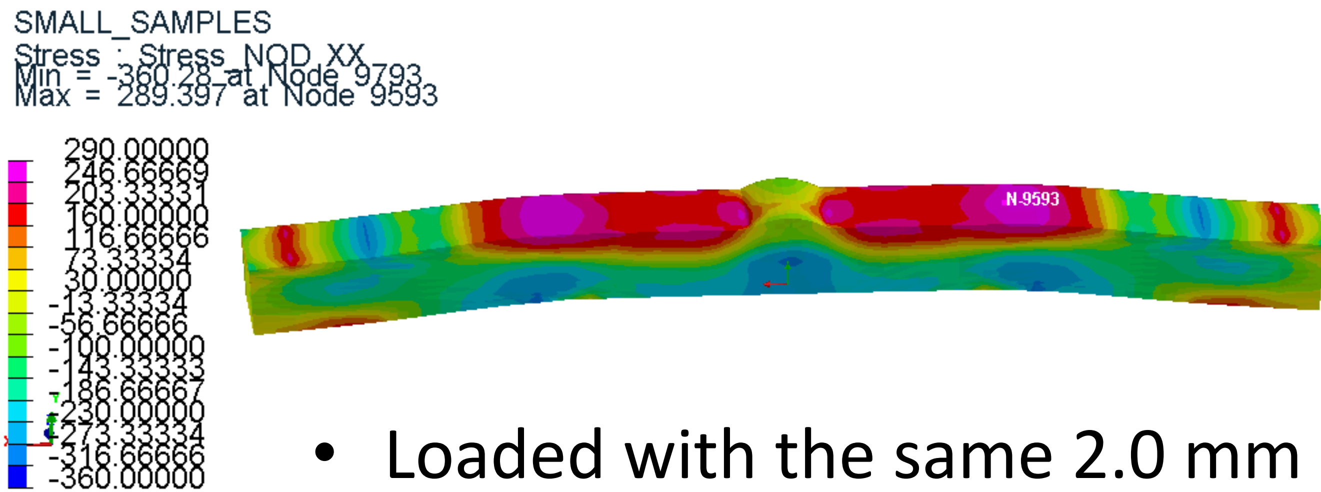


After Load (increased strain used to accelerate the testing)

Only Type 304 Stainless Steel

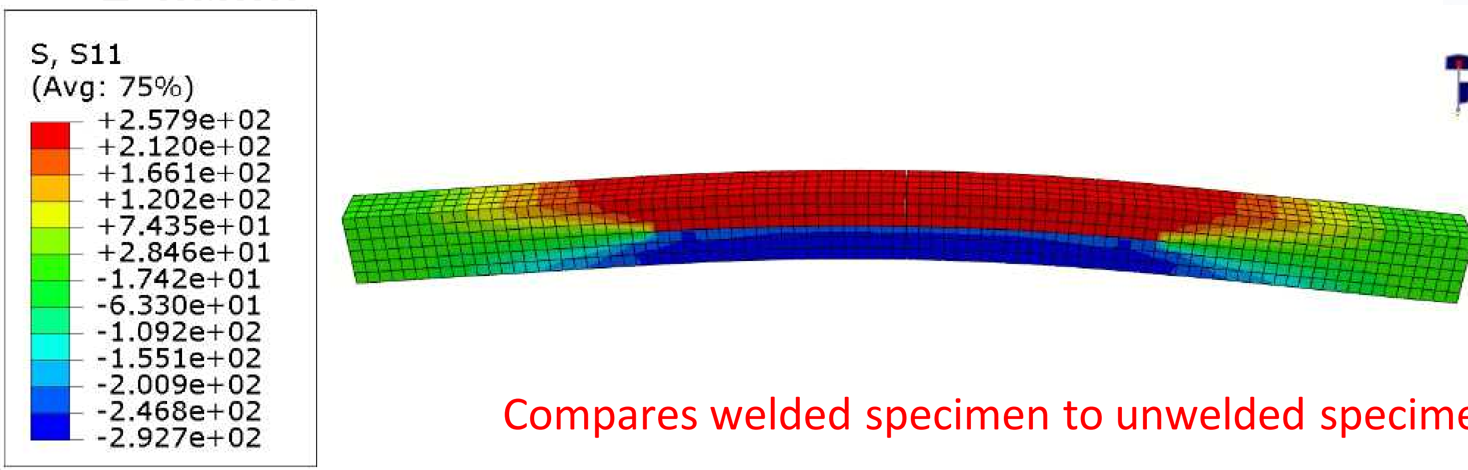
- Model does not use Type 308 stainless steel as filler material
- Does not consider change in mechanical properties in HAZ
  - Softening, grain growth, ferrite
- Must Verify actual strain using DIC

Loading Welded and Base Materials



SYSWELD Model
With Weld

- Loaded with the same 2.0 mm deflection

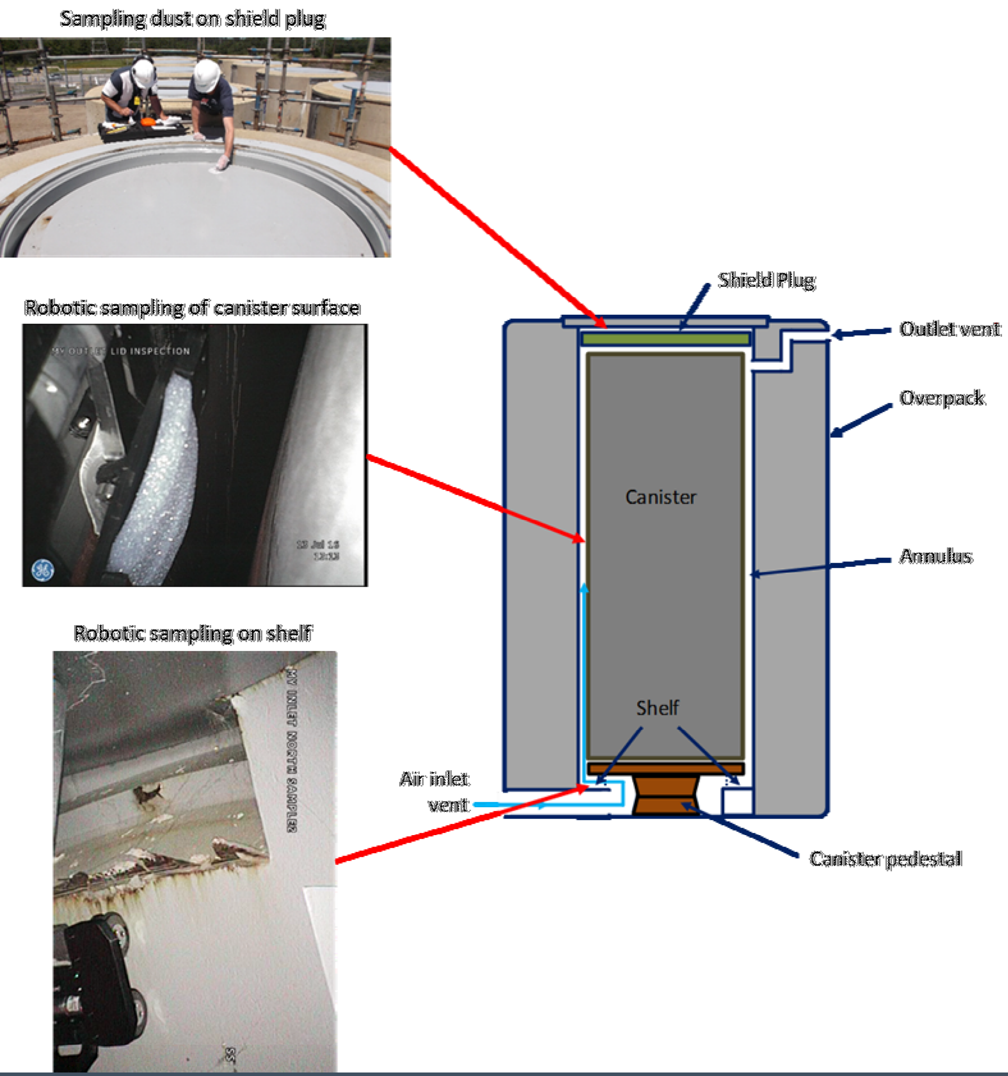


ABAQUS Model
Without Weld

Compares welded specimen to unwelded specimen

Maine Yankee Dust Analyses

EPRI-led effort to test robotic NDE delivery system on NAC vertical storage systems at Maine Yankee (July 2016):



Canister contained GTCC waste (*no heat generation*)

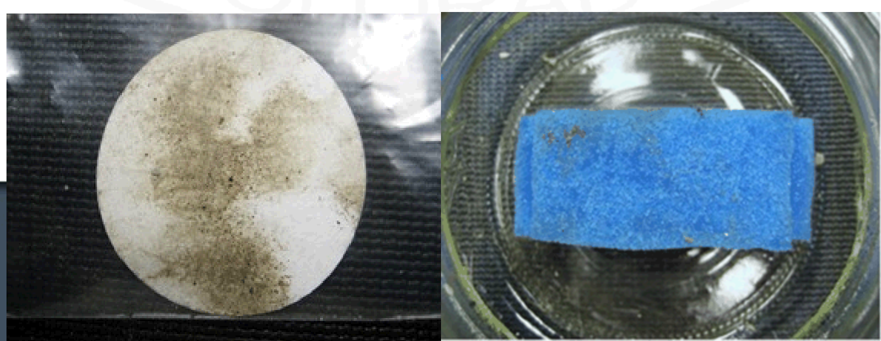
Deposits sampled from overpack surfaces (shield plug, overpack shelf) and one canister side location using wet filters/sponges

Samples delivered to SNL for analysis.

- *Soluble salts leached from collection media and analyzed by ion chromatography (IC) (anions, cations)*
- *Insoluble minerals on media analyzed by scanning electron microscopy (SEM/EDS)*
- *SAND report Bryan and Enos (2016)*

<u>Sampling Media</u>

Filter paper (diam. 4.5 cm) Sponge(length 5 cm)



Analytical results

Chemical analyses of dust leachates (µg/sample) (Bryan and Enos, 2016)

Sample #	Na^+	NH_4^+	K^+	Mg^{2+}	Ca^{2+}	F^-	Cl^-	NO_3^-	SO_4^{2-}
1 (filter) shield plug	86.6	0.1	34.2	12.2	66.1	0.7	**84.0**	8.7	179
2 (filter) shield plug	60.2	n.d.	13.8	6.4	52.7	0.6	**48.6**	3.2	102
3 (sponge) canister surf.	80.9	0.6	26.6	2.2	50.7	n.d.	**42.9**	167	6.0
4 (sponge) overpack shelf	65.7	*0.1*	24.4	2.7	60.4	*0.2*	**19.2**	188	10.9
5 (sponge) overpack shelf	63.6	*0.1*	24.6	2.5	67.8	*0.3*	**18.0**	178	15.1
6 (sponge) overpack shelf	60.6	0.2	22.3	2.5	57.2	n.d.	**14.8**	171	11.8
7 (sponge) overpack shelf	93.4	0.2	48.0	4.2	97.5	n.d.	**42.4**	343	15.5
8 (sponge) overpack shelf	80.7	0.4	61.4	4.3	111.8	n.d.	**28.7**	166	15.6

Note: Values shown in italicized gray type had clear IC peaks, but fell between the lowest standard and the blank, and are semi-quantitative.

Soluble salt compositions

- Shield plug— dominantly Ca-Na-SO_4-Cl
- Overpack shelf—dominantly Ca-Na-NO_3-Cl
- Canister surface—similar to overpack shelf salts

Salt aerosols are a mixture of sea-salts (Na-Cl-Mg) and continental aerosols (Ca-K-SO_4-NO_3)

SEM analysis of insoluble particles

- Dust insolubles dominated by silicate minerals—biotite (mica) flakes and quartz grains
- Abundant, well-crystallized clusters of Ca-silicates/aluminosilicates (concrete efflorescence)

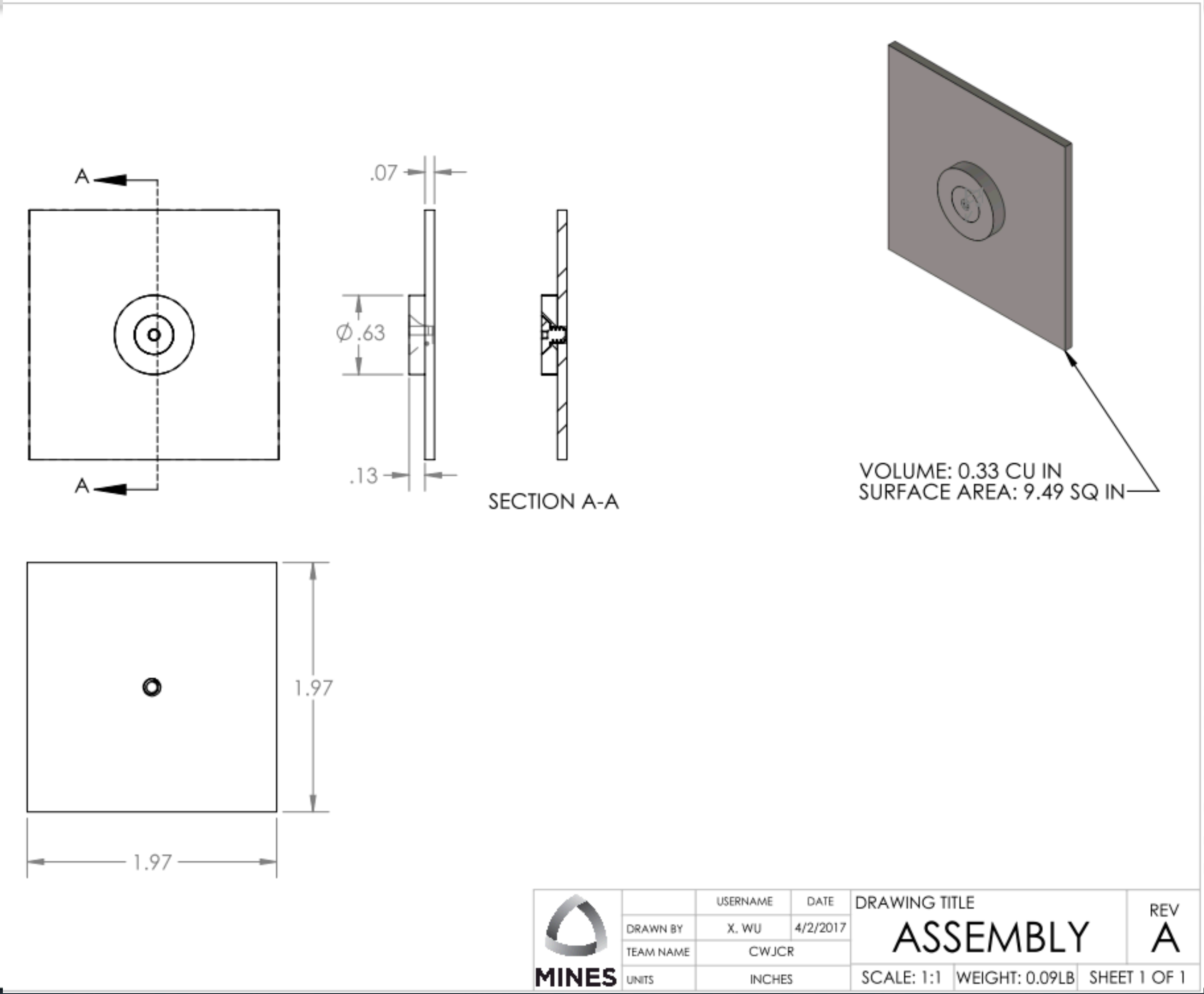
Calcium aluminosilicate crystals formed as cement efflorescence

Dust Collection

- In addition to the small and large specimen assemblies, there will be dust collection samples and rare earth magnets.
  - These are for collecting both airborne dust as well as magnetic dust representative of site conditions.
    - One dust specimen is made of silica glass
    - Type 304 stainless steel plate via a screw
      - Neodymium rare earth magnet

- What we hope to gain from our dust collection experiments
  - Rate of dust/salts deposited (mg/year)
    - Inlet vs outlet
    - Type of dust/salts
      - Iron vs mineral vs salt
  - Periodic measurements of weight
    - Maine Yankee and CSM personnel

Rare Earth Dust Collection Plate Drawings



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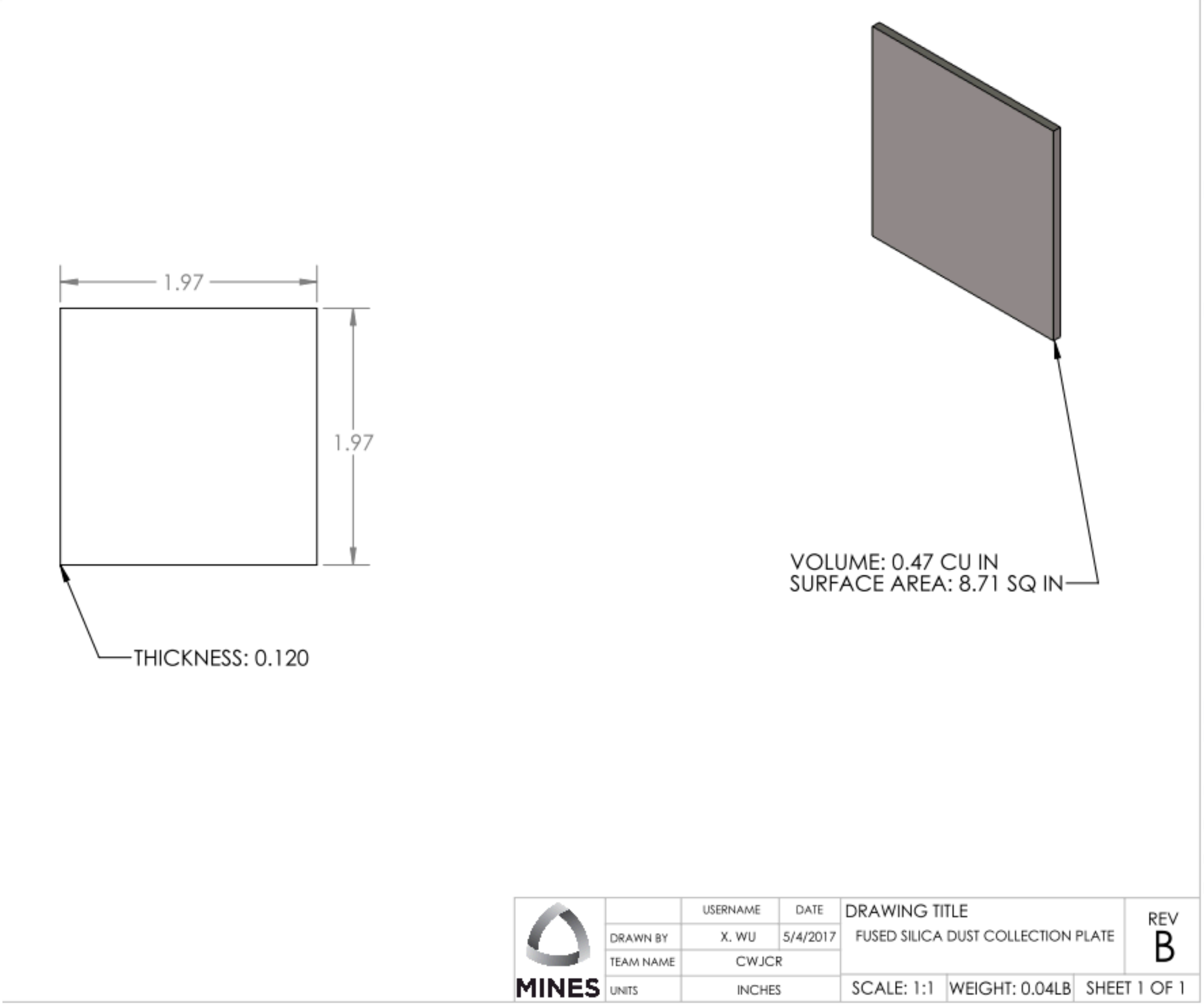
Stainless Steel Dust Collection Plate Drawings



Specimen Placement

The specimens will be placed in one inlet vent and one outlet vent of four VCCs based on the following criteria from CSM

- Two containers that have the highest decay heat loads , two containers that have the lowest decay heat loads.
- Both the high and low decay containers need to be in two different conditions
  - One exposed to the prevailing winds
  - the other sheltered from the prevailing winds.
    - The prevailing winds at the Maine Yankee site are primarily out of the northwest.

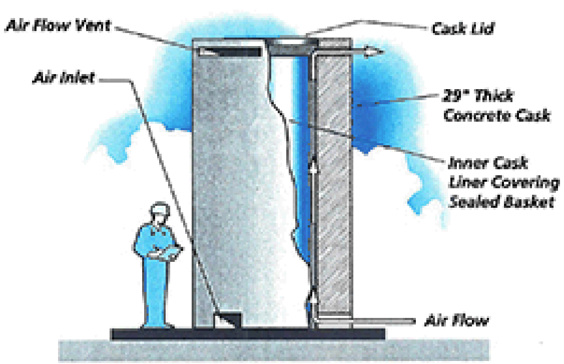
The VCCs in the table below were selected to best meet this criteria.

	High Decay Heat Load VCC	Low Decay Heat Load VCC
Sheltered Location VCC	Pad Location P5C5, VCC 37, TSC 31 (13.78kW)	Pad Location P2C4, VCC 56, TSC 20 (4.35kW)
Exposed Location VCC	Pad Location P6C8, VCC 42, TSC 52 (12.00kW)	Pad Location P9C6, VCC 18, TSC 03 (6.75kW)

Samples To Be Placed In Dry Storage Containers At Maine Yankee

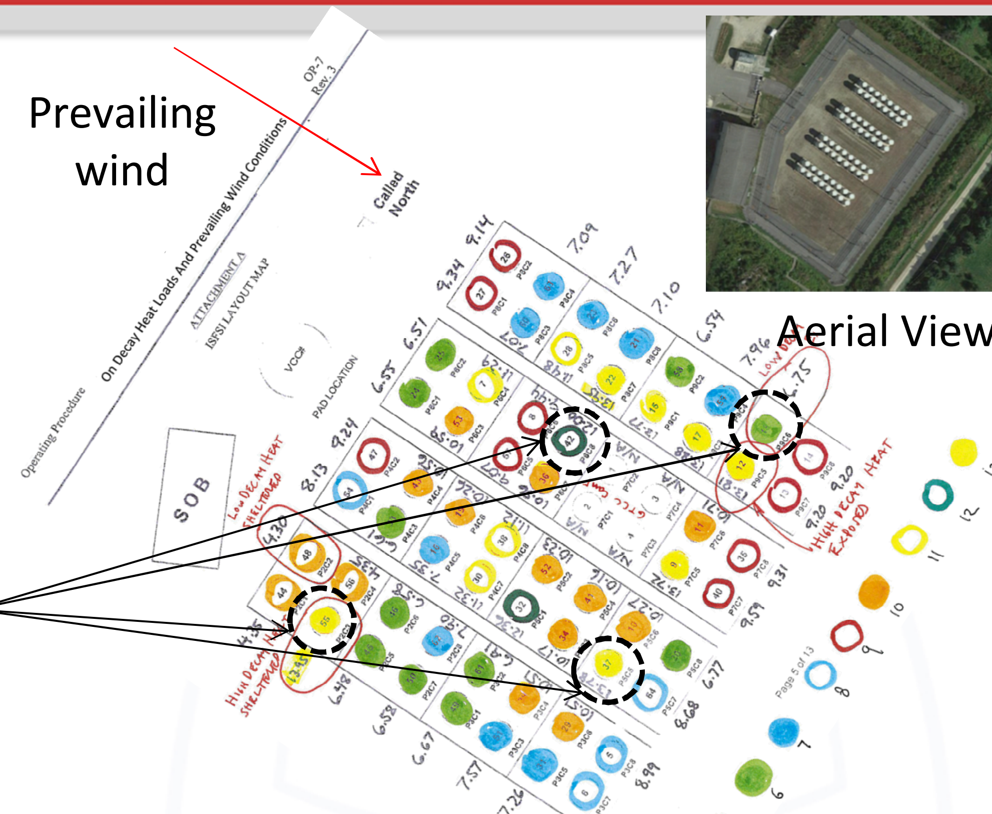
Ground View

Sectional View of a Dry Fuel Storage Container



Prevailing wind

Selected Containers



Aerial View

VCC	Inlet Vent Position	Outlet Vent Position	Specimen Configurations in Both One Inlet and One Outlet Vent
37	NE	N	1 Large, 3 Small, 1 Dust Collection Specimen and 1 Rare Earth Magnet
42	NW	S	1 Large, 3 Small, 1 Dust Collection Specimen and 1 Rare Earth Magnet
56	NE	N	1 Large, 3 Small, 1 Dust Collection Specimen and 1 Rare Earth Magnet
18	NW	S	1 Large, 3 Small, 1 Dust Collection Specimen and 1 Rare Earth Magnet

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Specimen Placement

Total

24 small specimens

- 8 rare earth magnets
- For both the inlet and outlet vents the small specimens and the magnetic dust specimen/plate will be ganged together with a threaded rod and will be positioned with the 2.37” dimension vertically

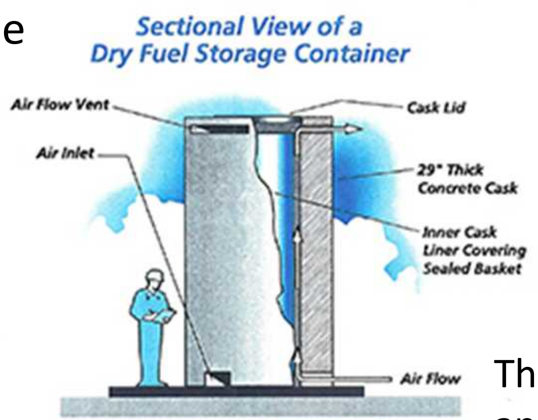
8 large specimens

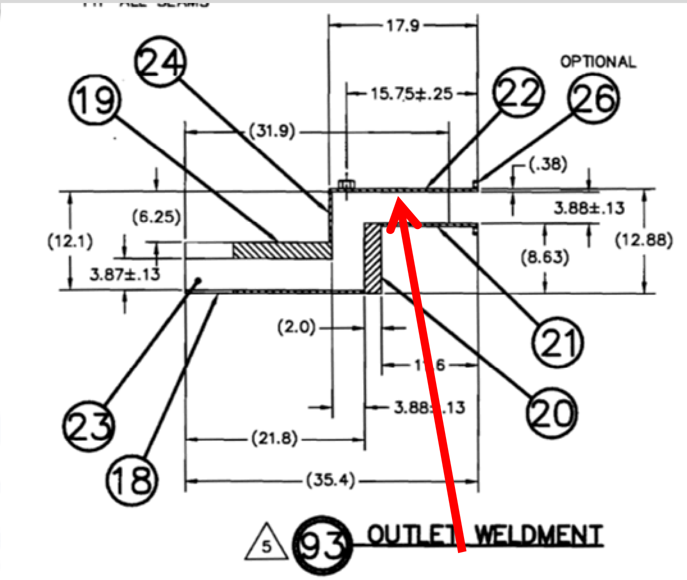
- 8 Fused Silica dust collection specimens
- The large specimens will be attached to the glass dust specimen and placed on their side.

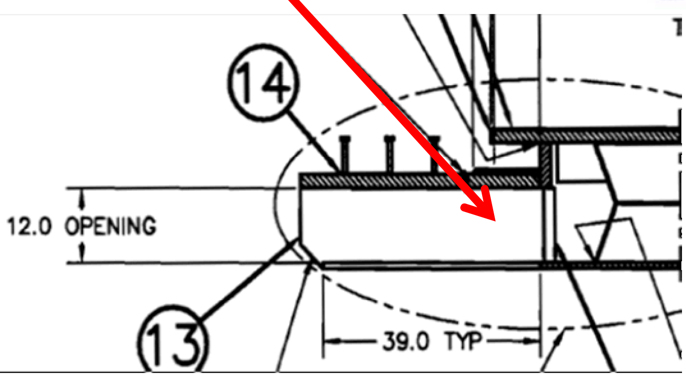
Specimen Placement

The inlet specimens will be placed approximately 32" into the vent, (roughly ¾ of the way in)

- Should be far enough in the vent opening to avoid interference with possible snow removal efforts
- not too close to the lower inner annulus region.







The outlet specimens will be placed approximately halfway into the off center top portion of the vent, which is roughly 7" from the VCC exterior mid-point.

- The method of inserting the specimens will employ a tool with an L bracket such as a hoe.
- There will be a cable attached to both specimen assemblies for retrieval purposes.

Length of Experiments

- The samples will be placed into the canisters and selected specimens will be removed after one year
- Further examinations and duration will be determined based on observations
- Duration could be several years (TBD)

Inspection

- Specimens will be taken out periodically by site personnel so CSM can perform non destructive examinations (NDE) to monitor any degradation effects.
  - VT, UT, ET, PT
    - Identification of pitting and/or cracks
- Destructive
- Photographs, LOM, SEM, TEM (as permitted on-site or CSM)
    - Pitting and Crack growth rates

This information will be used to assess both how vulnerable the canisters are to CISCC as correlated with the sites known environmental condition.

Off Normal Blockage Analysis

These obstructions do not result in complete blockage.

A selected VCC has only in one inlet with a 7.7% by area obstruction and one outlet with a 6.7% by area obstruction, which is bounded by the Off Normal event occurring when 50% of the air inlets are blocked.

- design basis heat load (23 kW), all "Maximum Temperatures" for the two blocked vent off-normal condition, are below the allowable maximum temperatures for normal operations.
- Loads in the proposed canisters (4.35 -13.78 kW) are significantly less than the design basis (23 kW)
- Vent blockage resulting from the samples (6.7-7.7%) is significantly less than 50% and
  - Would not be considered off-normal operations nor subject to the requirements associated with this condition.

- Reasonable to conclude that the maximum temperature rise expected from this smaller amount of blockage will remain below the allowable temperatures for normal operations.
  - On-line temperature monitoring will be used to verify that no appreciable change in temperature is occurring

Application of the Evaluation of the Effect of Supplemental Shielding Inserts on VCC Air Flow Analysis

Maine Yankee is approved for installation of radiation shields in the inlet vents for additional radiation shielding if deemed necessary by the site.

It has been concluded that installation of the vent shields in all four inlet vents of each VCC "have no impact on the maximum temperature of the components or contents".

- These vent shields, which have a larger cross section than the specimens, were determined to be acceptable for normal operations
- It is reasonable to conclude that the corrosion samples would result in less air flow blockage than the vent shields and the proposed action is bounded by existing approved designs.

Margin Between Heat Load of Maine Yankee Casks Versus Design Basis Heat Load

The UMS storage system is designed for a maximum heat load of 23 kW.

- The highest heat load canister at the site was 13.95 kW during initial loading and the highest heat load canister included in this action was 13.78 kW during initial loading which are both well below the design heat load and have decayed to a lower value with the passage of time.
- This conservatism provides another layer of margin to the bounding arguments used

Material Specifications Used and their Compatibility With VCC and Canisters

The materials used in this project are not expected to be in contact with the canister.

- In the unlikely case there is contact, the specimens, tensioners, coatings, never seize lubricant and marker paint are all compatible with the Type 304/304L stainless steel of the canister.

Questions

Thank you!