

Reinhold Environmental Ltd.



2008 NO_x-Combustion Round
Table & Expo Presentation

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Auxiliary Isolation Barriers for SCR Catalyst Maintenance

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Exclusively distributed by:

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Scherba Industries, Inc.
2880 Interstate Parkway
Brunswick, OH 44212



- Business started in 1982
- Current facility since 1996 is 40,000 sq. ft.
- Recognized leader in cold air inflatables

What's a Duct Balloon?

- Portable inflatable barrier
- Can fit through most existing man ways
- Supplied with a 120V blower
- Can be quickly removed when finished
- Material rated to 485°F (251°C)
- Reusable

How does it work?



Engineered to expand and create a tight seal

Initial Concept

- ◆ American Electric Power approached us in 2001
- ◆ Thousands of \$\$\$\$ spent on temporary barriers
- ◆ Criteria for design
- ◆ Samples were given for testing

AEP's Application

- ◆ Multiple units sharing one common stack
- ◆ Leaky isolation dampers on out-of-service units
- ◆ Leaks created operating problems

Possible Solutions

- ◆ Replace it completely
- ◆ Replace the blade seals
- ◆ Build a temporary barrier
- ◆ Install an inflatable “Duct Balloon”

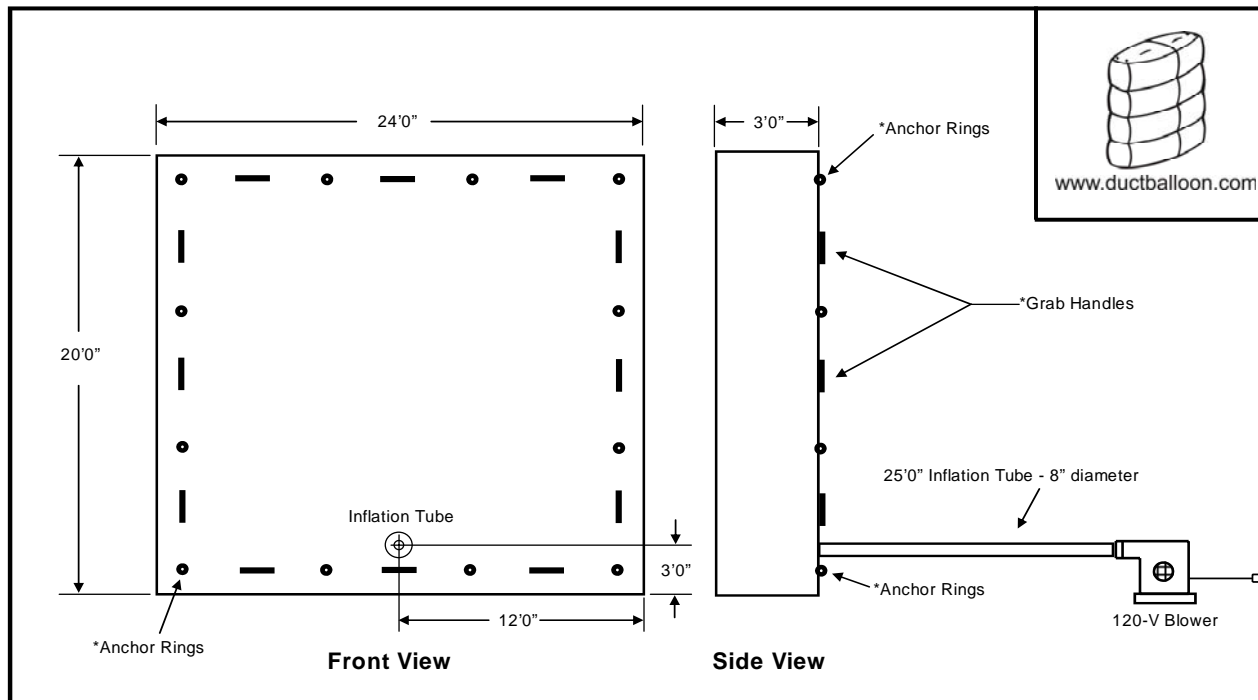
Information we require

- ◆ Quantity
- ◆ What is the inside dimension of the duct?
- ◆ What is the access door size?
- ◆ Does the duct work run horizontal or vertical?
- ◆ How far from the access door will it be installed?

In House Engineering Information

- ◆ Inflation tube location on balloon
- ◆ Anchor ring location, grab handles, extra deflation zippers, special request, etc.
- ◆ Layout drawing submitted for approval

Layout Sketch



Duct Balloon Layout Drawing		
<ul style="list-style-type: none"> ⊕ Inflation Tube • Anchor Rings — Grab Handles 	<p>*Note: Anchor rings and grab handles are on one side only unless specified otherwise</p>	
Customer: Exelon - Eddystone Station	Date: 03-15-2005	Scale: NTS
Location: Philadelphia, PA	Drawn By: Gary Werth	Telephone: 630-564-7471
Size: 24'0" x 20'0" x 3'0" with 120V High Pressure Blower		

● See the finished product!

Finished product!



- ◆ 24' high x 20' wide x 3' deep (Why 3' deep?)
- ◆ Will fit through a 24" x 30" man way
- ◆ Weighs about 95 lbs.

How is it made?



- ◆ Separate air chambers
- ◆ Equally spaced on various centers

What's inside?



- ◆ Bulkhead design
- ◆ 8" penetration in walls

Materials of construction

- ◆ 420 denier nylon, 6.5 mils thick, 11.5 oz sq.yd.
- ◆ Rated to **485°F (251°C)**
- ◆ Other materials are available

How much do they weigh?

- ◆ 100 sq. ft. = 25 lbs.
- ◆ 150 sq. ft. = 35 lbs
- ◆ 200 sq. ft. = 45 lbs
- ◆ 250 sq. ft. = 55 lbs
- ◆ 300 sq. ft. = 70 lbs
- ◆ 400 sq. ft. = 90 lbs
- ◆ High Pressure Blower = 40 lbs.

How much do they cost?

- ◆ Average \$60 per square foot of face area
- ◆ Pays for itself in the first installation and removal
- ◆ It's reusable!
- ◆ Using union labor, a wood & plastic sheeting barrier cost over \$100 per square foot
- ◆ Temporary materials are tossed out

How are they installed?

- ◆ Check for any sharp items or edges in duct
- ◆ Install Pad eyes if necessary
- ◆ Bring the balloon and blower to access door
- ◆ Lay the balloon down into desired position
- ◆ Connect the inflation tube to 120V blower
- ◆ Start blower and position in place during inflation

How accurate do my dimensions need to be?

- ◆ Made to customers specifications
- ◆ Taken from plant drawings
- ◆ Measure outside of duct work
- ◆ We add to the duct work measurements

How is it deflated?

- ◆ Turn off the blower
- ◆ Removing inflation tube
- ◆ Open the large zippers

Where do you place the blower?

- ◆ In the duct work is OK
- ◆ On grating outside the duct work
- ◆ Watch for tripping hazards
- ◆ Use Flex Duct for 90° turns
- ◆ No limit on supply tube length

Can I inflate it once ?

Blower system must always remain on

- ◆ Each balloon needs it's own blower

Is the blower expensive to operate?

- ◆ Operates at 120V, 208V or 220V
- ◆ Draws between 6 to 11 amps
- ◆ Cost is pennies' a day to operate

Can I use station air ?

- ◆ Station air is usually low volume
- ◆ Balloon requires 1000+ CFM continuously

What if gets torn?

- ◆ Use duct tape
- ◆ Small tears won't affect performance
- ◆ Use repair kit
- ◆ Send it back to the factory

What about duct work obstructions?

- ◆ Look at expansion joints areas
- ◆ Ask for a custom shape

Expansion Joint Area



Pleasant Prairie Power Plant – 9'6" high x 38'0" wide duct

How can make sure it doesn't move?

- ◆ High pressure blower operates at 10" w.g.
- ◆ Use a piece of scaffolding keep it in place
- ◆ Install pad eyes in the duct
- ◆ Use nylon rope between the pad eyes and the anchor rings

Securing balloon in duct work



Tie down using angle clips welded to duct wall

Securing balloon in duct work



Tie down using angle clips welded to duct wall

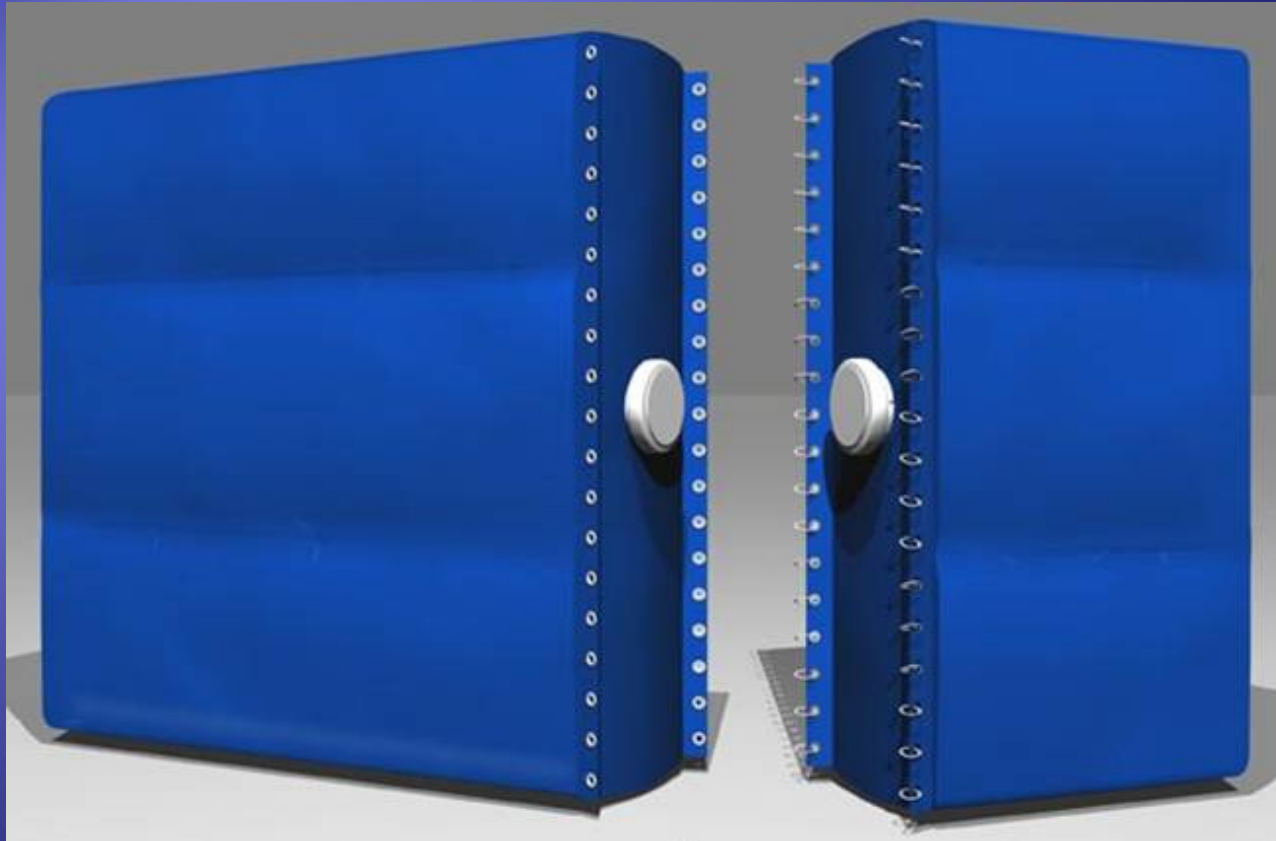
Is there any way to protect it?

- ◆ Specify additional anchor rings
- ◆ Use a fire retardant blanket
- ◆ Place insulation in front or underneath it

How large can they be made?

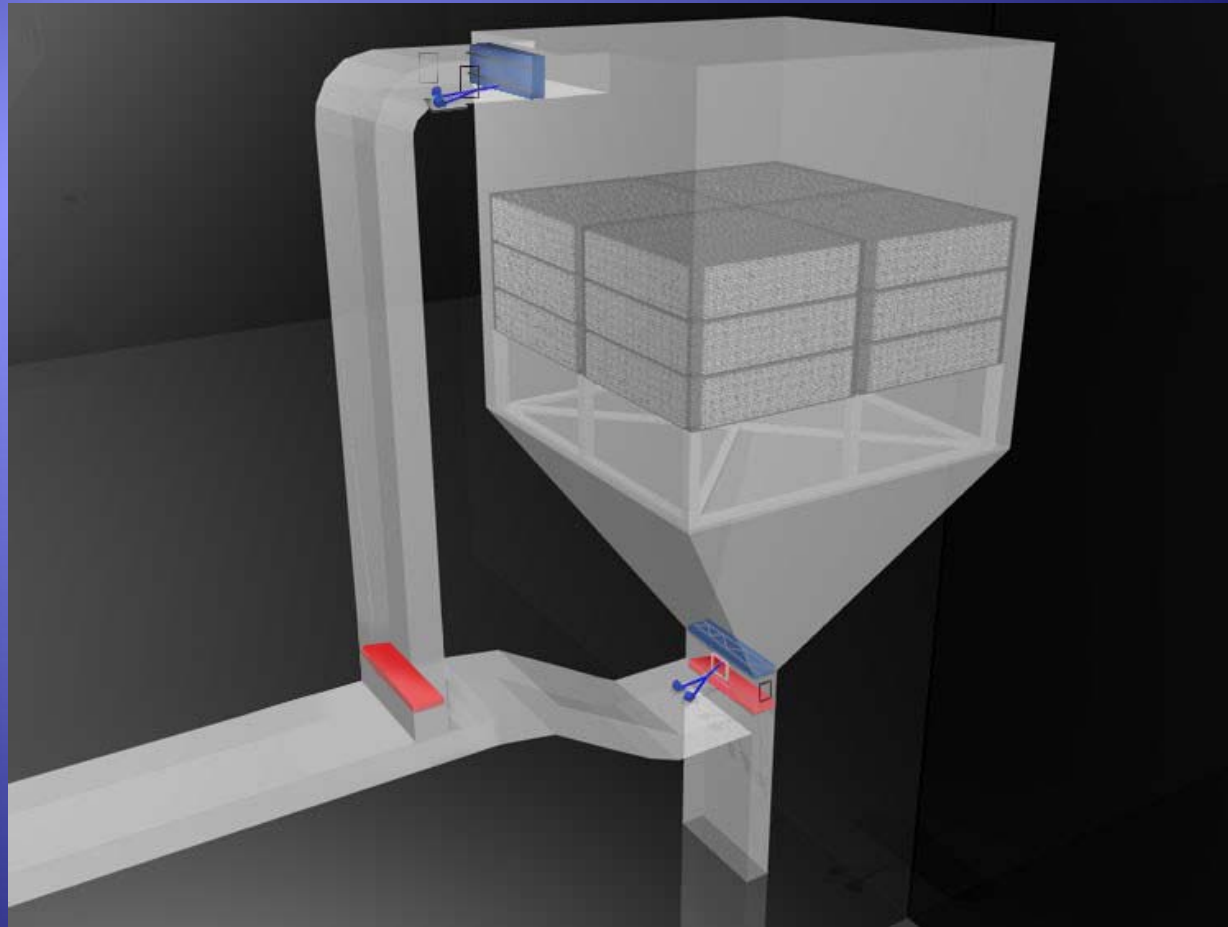
- ◆ No size limitations
- ◆ Weight can become prohibitive
- ◆ Use the Multi-Size style

Multi-Size Duct Balloons



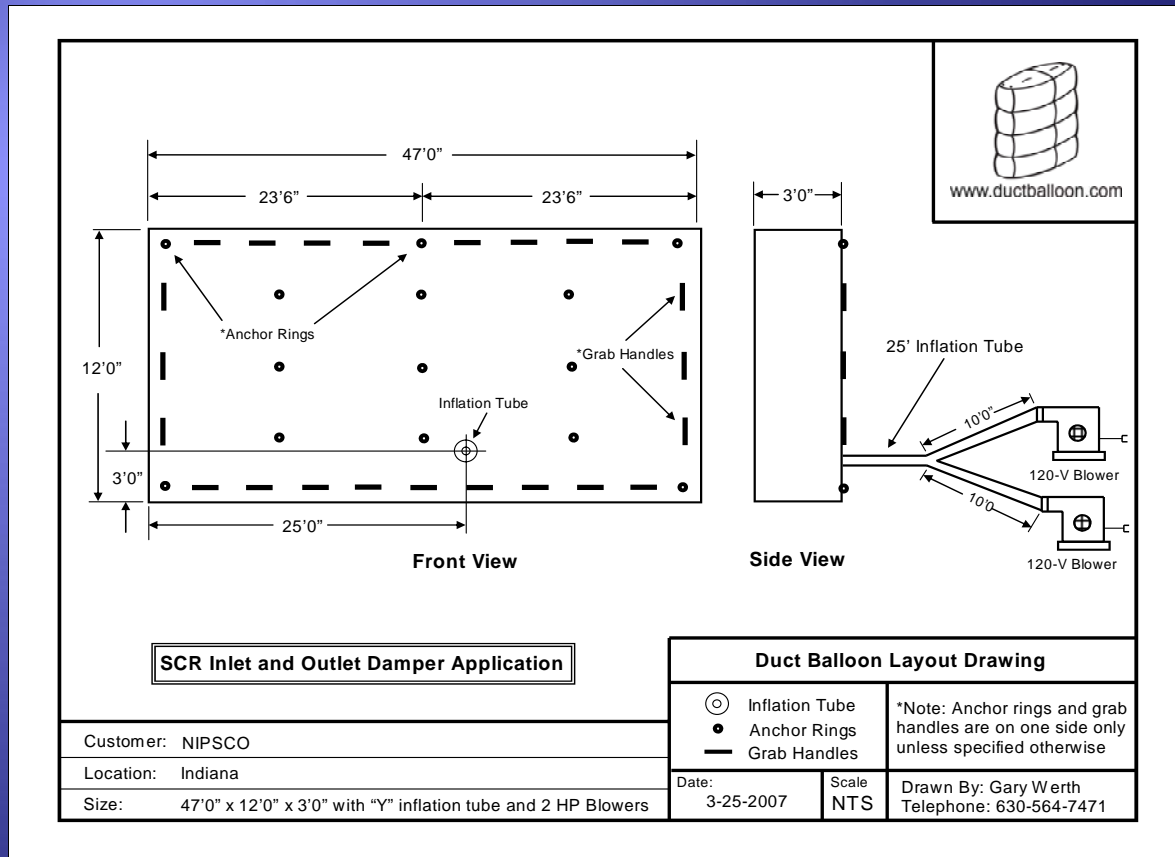
- ◆ Inflation tube mates on top or sides
- ◆ Attaches together via nylon rope or quick links

SCR and FGD Applications



- ◆ Inlet dampers to SCR
- ◆ Outlet dampers from SCR

NIPSCO – SCR Inlet Duct Balloon Layout Drawing



- ◆ Two blowers with "Y" inflation tube
- ◆ Blowers connected to different circuit breakers

SCR application sequence

- ◆ NIPSCO – Bailly Station catalyst change out
- ◆ Two duct balloons and four blowers were supplied
- ◆ The dampers were pinned closed
- ◆ Seal air systems were activated
- ◆ Mineral wool insulation installed on dampers
- ◆ SCR Inlet balloon installed near turning vanes
- ◆ Insulation laid down on SCR outlet damper
- ◆ SCR Outlet balloon installed on top of insulation
- ◆ Inflation time was less than 10 minutes each

SCR Inlet Duct Balloon



This balloon measures 12'0" high x 47'0" wide x 3'0" deep (Damper Side)

SCR Inlet Duct Balloon



Same picture showing inflation tube side (Note “D” Rings and Grab Handles)

SCR Application



25'0" x 13'6" x 3'0" for NIPSCO U12 SCR
Project