

NON-TOXIC

**MADE IN
USA**

SILFLEX

— ADVANCED SHIELDING MATERIALS —

®

CUSTOM SHIELDING SOLUTIONS

LIGHTWEIGHT

CUSTOMIZABLE

NON-TOXIC

RUGGED

SILFLEX

— ADVANCED SHIELDING MATERIALS —

HEAT TOLERANT

**SUPERIOR
SHIELDING
TECHNOLOGY**

**BORIC ACID /
SODIUM HYDROXIDE
RESISTANT**

ABOUT AMERICAN CERAMIC TECHNOLOGY

American Ceramic Technology, Inc. is the Manufacturer of Silflex® Shielding, the industry's most innovative and award winning radiation shielding material. ACT, inc. has always been a materials based company, and has worked in many different industries. It was in 2005 that Silflex® was developed and **after 14 months of testing Silflex® was certified by Entergy for use in the Nuclear Industry.**

Our presence in the Nuclear Industry has been very fulfilling, we take pride in our custom solutions and enjoy helping our customers achieve their ALARA goals. Silflex® has changed the way people think about their shielding options. Our innovative approach to shielding allows nuclear plants to implement a safer, cleaner and more efficient work environment. We believe our customers deserve the best and therefore we continue to research and develop our products and materials. We are proud to offer not only radiation shielding but also shielding racks, carts and enclosures.



TABLE OF CONTENTS

ABOUT SILFLEX	4
AWARDS/CERTIFICATIONS/CLIENTS	5
SILFLEX® TECHNOLOGY	6
CASE STUDY	7
SILFLEX® SHIELDING SOLUTIONS	8
PREMIUM MAGNETIC	12
FLOORING	14
SHEETS	18
PIPE WRAPS	21
CUSTOM SHIELDING	22
ELECTRONIC SHIELDING & FRISKER CAVES	23
NEUTRON SHIELDING	24
PERSONAL PROTECTION	26
REMOVABLE INSULATION	27
RACKS / CARTS / ENCLOSURES	28

ABOUT SILFLEX®

The Silflex® Material System is flexible, moldable, NON-TOXIC and engineered to provide superior radiation shielding. Its silicone and proprietary mixture of radiation shielding materials have been selected to provide a broad range of solutions to assist the ALARA personnel in meeting facility personnel exposure goals. Silflex® maintains superior conformability, stretch-ability, and excellent ruggedness. Silflex® provides exceptional stability at high temperatures, in moist conditions, and exhibits superior resistance to boric acid and sodium hydroxide. The Silflex® Material System can be applied as a permanent or temporary shielding solution and can be engineered to meet weight and size requirements. The Silflex® product line offers Sheets, Pipe Wraps, Tapes, Flooring, Custom Shapes, Personal Protection Vests, and Premium Magnetics.



SILFLEX
— ADVANCED SHIELDING MATERIALS —

- + From conception to completion every product is custom-built for utmost efficiency
- + We engineer every piece of shielding to meet our customers weight requirements & attenuation goals
- + Silflex® radiation shielding materials include Tungsten, Iron, Bismuth and Neutron

SILFLEX® SILICONE AND PROPRIETARY MIXTURE OF RADIATION SHIELDING MATERIALS HAVE BEEN SELECTED TO PROVIDE A BROAD RANGE OF SOLUTIONS TO ASSIST THE ALARA PERSONNEL IN MEETING FACILITY PERSONNEL EXPOSURE GOALS.



CERTIFICATIONS

SILFLEX® RADIATION SHIELDING HAS BEEN TESTED AND APPROVED BY THE NUCLEAR INDUSTRY

ENERGY/ANO
CERTIFICATION
PER OUR
PROCEDURE
EV-112

APPROVED
FOR USE
ON SS, ETC

ADDED TO
APPROVED
LIST,
CHEMICAL
3601

AWARDS



2010
UTILITY
ACHIEVEMENT
AWARD
AMERICAN NUCLEAR
SOCIETY

2011
PROCESS
AWARD
NUCLEAR ENERGY
INSTITUTE

2010
PROJECT OF
THE YEAR
POWER ENGINEERING
INSTITUTE

CLIENTS

COMPANIES & ORGANIZATIONS WHO PUT THEIR TRUST IN SILFLEX® PRODUCTS



SILFLEX[®] TECHNOLOGY

BENEFITS

- + Non-toxic - no mixed waste
- + Superior Shielding properties
- + Lightest shielding available for a given attenuation.
- + Small pipe shielding - less than 1"
- + Customizable - you dream it we can make it
- + Does not require Re-Sealing
- + Easy to work with - trim, cut, abrade, drill, punch
- + Withstands up to 250°C for continuous exposure temperature
- + Several NON-TOXIC material blends available

CHEMICAL RESISTANCE

- + Highly resistant to exposure to Boric Acid and Sodium Hydroxide
- + Virtually no change in physical properties after 168 hours of exposure
- + Excellent chemical resistance at elevated temperatures

MATERIAL RUGGEDNESS

- + Highly resistant to physical abuse including puncture (material DOES cut with sharp scissors or cutting device)
- + Very good abrasion and tear-resistant - material elongation is a minimum of 100%
- + Excellent conformability to wide variety of shapes

MATERIAL COMPATIBILITY

- + Galvanized carbon
- + Raw Steel
- + Stainless steel

CASE STUDY

BEST NUCLEAR PROJECT

New-generation tungsten shield project at Arkansas Nuclear One



The development of new-generation tungsten shields at Arkansas Nuclear One (ANO), operated by Entergy, is the Nuclear Project of the Year. ANO attempted to look beyond conventional materials such as lead, steel and water for methods in shielding applications. The result was the development of a flexible, heat-resistant shielding made of tungsten and iron metal powder immersed in silicone polymer.

The project consisted of two parts. The first entailed shielding the source. Lead blankets have been the backbone of shielding applications in the past, but ANO found the tungsten shield to be twice as effective as lead in lowering exposure rates to the worker.

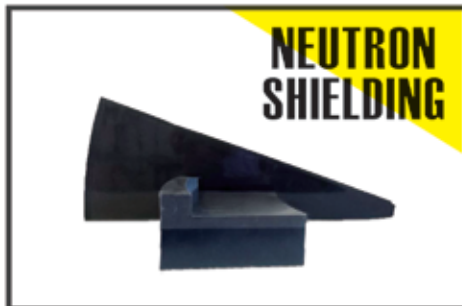
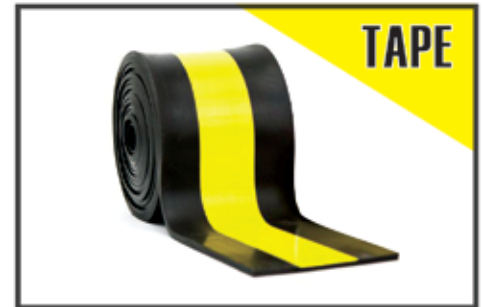
The tungsten shield weighs 25 to 50 percent less than lead while removing the accompanying toxicity hazard and mixed waste processing costs. This significant weight reduction resulted in improved industrial safety conditions and reduced worker fatigue. In total, the shielding resulted in \$319,000 total savings.

Part two of the tungsten shielding project was shielding the person. By using a tungsten vest, the team's theory was, "If you can't shield the source, shield the person." The ANO team found the fabricated tungsten vest to provide better radiation protection than a lead application, proving to be more effective at stopping gamma rays.

The ANO team found that wearing a tungsten vest eliminates building temporary shielding racks and avoids exposure for short duration evolutions. All material used in the tungsten shielding vest is non-toxic and non-hazardous waste, eliminating such concerns that are associated with lead shielding. Exposure to the welders was reduced by 39 percent through the use of the tungsten vests. The total exposure avoided was 642 person-mRem.

SILFLEX[®] SHIELDING SOLUTIONS

FROM CONCEPTION TO COMPLETION EVERY PRODUCT IS CUSTOM-BUILT FOR UTMOST EFFICIENCY



We engineer every piece of shielding to meet our customers weight requirements & attenuation goals!

NON-TOXIC

AWARD WINNING

MADE IN USA



PREMIUM MAGNETIC SHIELDING PRODUCTS

PATENTED

MADE
IN
USA

SILFLEX
— ADVANCED SHIELDING MATERIALS —

APPLIES
INSTANTLY
(MAGNETIZED)

ACCELERATED INSTALLATION SPEED

“ Because of the flexibility and the integrated magnetic material, we call it the snap-on-snap-off shield. It attaches easily in the field, is lightweight and so versatile! ”

=

APPLIES
INSTANTLY

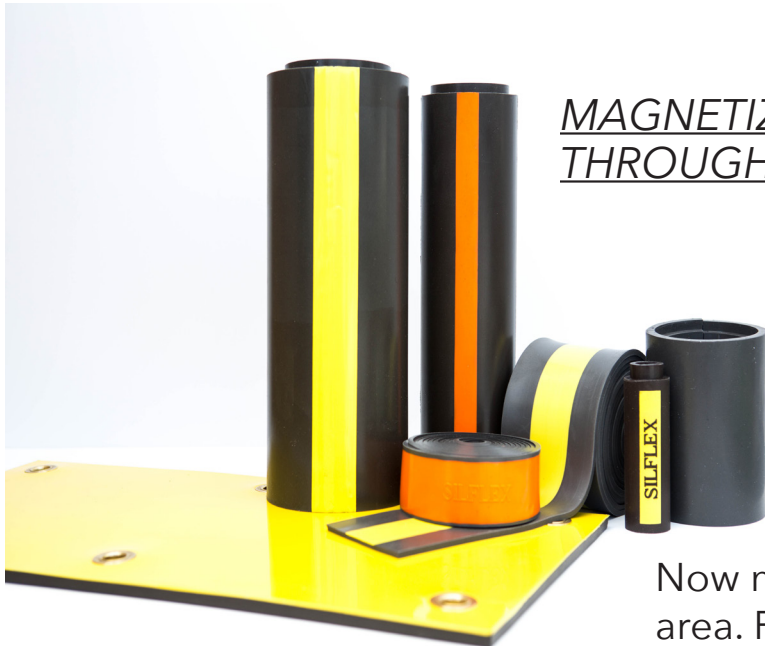
Siltex® Premium Magnetic Shielding Products apply quickly and easily; thus reducing the exposure to harmful radiation in critical environments.

REQUIRES
NO
SECONDARY
ATTACHMENT

LOWER
DOSE

PREMIUM MAGNETIC SHIELDING PRODUCTS

SILFLEX® PREMIUM MAGNETIC PRODUCTS INCLUDE SHEETS, TAPES, PIPE WRAPS, AND CUSTOM SHAPES THAT ARE NOW AVAILABLE WITHOUT THE USE OF IMPLANTED MAGNETS.



MAGNETIZED
THROUGHOUT!!


Now magnetized throughout the entire surface area. Providing a more secure and speedy application. This unique technology allows for shielding of magnetic and non-magnetic surfaces with the use of other Silflex® radiation protection products.

+MAGNETIC
+TRIMMABLE
+FLEXIBLE
+RUGGED
+CONFORMABLE

MATERIALS AVAILABLE

- BISMUTH
- IRON
- NEUTRON
- STAINLESS-STEEL
- TUNGSTEN

SEISMIC TESTED
to IEEE-344
STANDARD
by EPRI



PATENTED

**QUICKLY
STACK SHEETS
UNTIL YOUR
DESIRED
ATTENUATION
IS ACHIEVED.
THE PREMIUM
MAGNETIC
PRODUCT IS A
PERMANENT
MAGNET
PRODUCT.**

Silflex® Premium Magnetic products are perfect for building shielding systems, including large diameter pipes, reactor walls, temporary racks, and anything made from carbon steel, stainless steel and mild steel.

Single sided magnetic sheets are great when applying shielding directly to carbon steel, stainless steel and mild steel. Double sided magnetic sheets allow you to wrap the blanket so that it secures to itself.



SILFLEX® FLOORING SHIELDING PRODUCTS

Silflex flooring tiles come in interlocking and straight configurations. Interlocking tiles are designed to stay together with pedestrian traffic and prevent radiation streaming. Chamfered edges can be provided for access points on stairways.



THE TEXTURED,
NON-SLIP SURFACE
OF THIS PRODUCT
MAKE IT A GREAT
SOLUTION FOR
SHIELDING SOLID
OR GRATED PLAT-
FORMS.

SILFLEX® FLOORING SHIELDING PRODUCTS

TEXTURED, NON-SLIP SURFACE

MADE IN
USA



**EASY
TO TRIM**

SILFLEX® PRODUCTS
ARE EASY TO TRIM
AND CUSTOMIZE!

SILFLEX[®] SHEETS

SHIELDING PRODUCTS

NONTOXIC / CUSTOMIZED
TO JOB SPECIFICATIONS

AVAILABLE IN VARIOUS SIZES/THICKNESSES
STARTING AT 1MM THICK

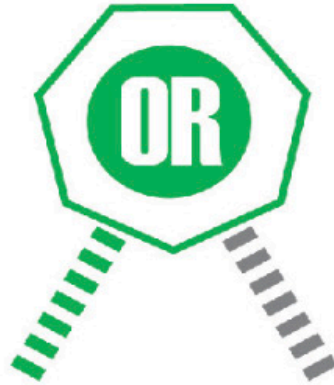
PATENTED

SILFLEX
ADVANCED SHIELDING MATERIALS

THIS PRODUCT
CAN BE
MAGNETIZED
(APPLIES INSTANTLY)

MADE
IN
USA

**YOU
CAN HAVE
THIS**



**YOU
CAN HAVE
THIS**

**SILFLEX® LEAD WOOL
REPLACEMENT (LWR)**

Silflex® Lead Wool Replacement Blankets provide the same attenuation as lead wool blankets; with 30% less weight.



STANDARD LEAD BLANKET

**LEAD PRODUCTS LOSE
EFFECTIVENESS OVER TIME.
SILFLEX® DOES NOT!**



SILFLEX® SHEETS SHIELDING PRODUCTS

SILFLEX® SHEETS ARE THE NON-TOXIC AND NON-HAZARDOUS ALTERNATIVE TO LEAD BLANKETS. THEY CLEAN-UP EASY AND ELIMINATE THE POSSIBILITY OF MIXED WASTE CONTAMINATION COSTS!

Silflex® Sheets are your choice for the alternative to lead wool blankets. The products flexible materials make it easier to maneuver, and the sleek design eliminates material handling difficulties. Silflex® lead wool replacement Sheets provide the same attenuation as lead wool blankets with 30% less weight and un-like lead, they do not lose effectiveness over time.

MATERIALS AVAILABLE

- BISMUTH
- IRON
- NEUTRON
- STAINLESS-STEEL
- TUNGSTEN



SILFLEX® TAPE SHIELDING PRODUCTS

THE MOST VERSATILE PIECE OF SHIELDING THAT WE OFFER. IT IS EASY AND CONVENIENT TO APPLY, MAKING IT THE PERFECT TOOL FOR TAKING CARE OF EMERGENCY "HOT SPOT" SITUATIONS.

Tape can be wrapped around pipes, elbows, valves, etc. At 1/8" thick, tape is less than 7/10 of a pound per linear foot and has an equivalent attenuation to a 10 lb lead wool blanket.



MATERIALS AVAILABLE

- BISMUTH
- IRON
- NEUTRON
- STAINLESS-STEEL
- TUNGSTEN

TAPE SPECIFICATIONS

STANDARD
WIDTH
1.75" & 3.75"

STANDARD
THICKNESS
.125" - .5"

STANDARD
LENGTH
15'

SILFLEX® PIPE WRAPS SHIELDING PRODUCTS

PATENTED

SILFLEX
— ADVANCED SHIELDING MATERIALS —

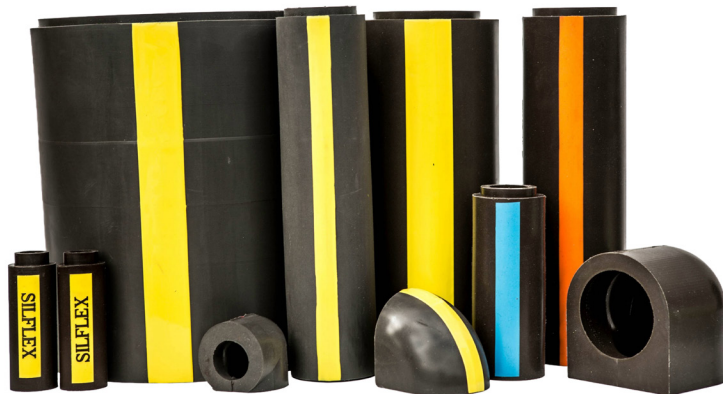
THIS PRODUCT
CAN BE
MAGNETIZED
(APPLIES INSTANTLY)

MADE
IN
USA

SILFLEX® PIPE WRAPS SHIELDING PRODUCTS

PIPE WRAPS ARE CUSTOM DESIGNED FOR A QUICK INSTALLATION OF SHIELDING ON PIPES, ELBOWS, TEES, AND VALVES.

No more cumbersome wrapping or heavy lead blankets. Silflex® Pipe Wraps are custom-engineered to fit your exact pipe diameter, with thickness, width, and height tailored to your weight, size, and attenuation requirements.



Silflex® Pipe Wraps are a great solution for shielding pipes that are in small or hard to reach areas. It is also a great way to put shielding directly on the source.

SILFLEX® CUSTOM SHIELDING PRODUCTS

WE UNDERSTAND THAT EVERY JOB IS DIFFERENT AND EVEN THOUGH SOME PLANTS MAY BE SIMILAR NONE OF THEM HAVE THE EXACT SAME PROBLEMS. THAT IS WHY EVERYTHING WE MAKE CAN BE CUSTOMIZED TO MEET INDIVIDUAL CUSTOMER NEEDS.

We take pride in helping our customers create the perfect shielding solution that meet and exceed their goals. With every customer we take the shielding application, attenuation goals, engineering and weight restrictions, and budget into consideration to create the best solution. No job is too little or too big for creating innovative designs, and if you have a problem area we can help you find a solution.

MATERIALS AVAILABLE

- BISMUTH
- IRON
- NEUTRON
- STAINLESS-STEEL
- TUNGSTEN

PRODUCT ENHANCEMENTS

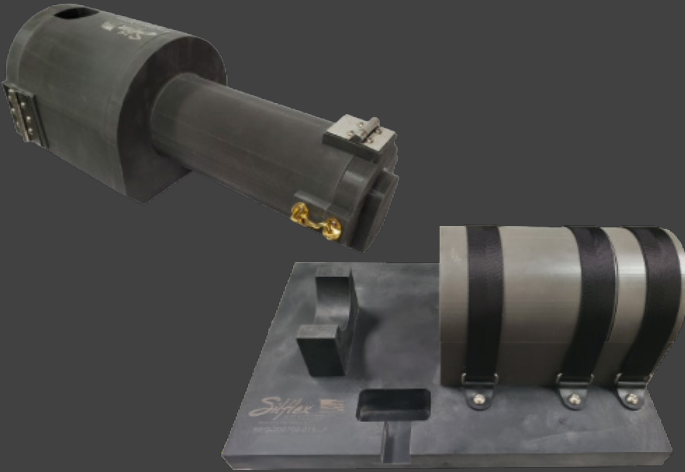
GROMMETS: Makes hanging or securing products easier. **METAL:** Can be added to shielding for increased support or as a design feature.

PERMANENT: Depending on application Silflex® may be installed as a permanent solution for up to 20+ years.



SILFLEX® ELECTRONIC SHIELDING & FRISKER CAVES

ELECTRONIC SHIELDING



SILFLEX® protects sensitive instrumentation – including cameras, collimators, and whole body monitors – from background radiation that can cause false readings or permanent damage. Offering non-hazardous, cost-effective alternatives to lead and pure tungsten, SILFLEX® provides custom shielding solutions that reduce background interference, extend equipment lifespan, and ensure accurate, reliable data collection.

FRISKER CAVES

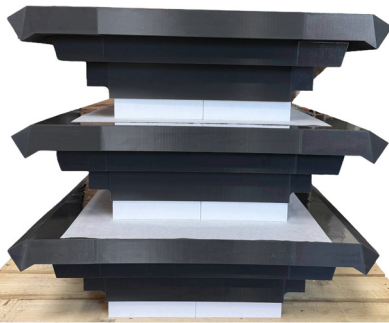
SILFLEX® Frisker Caves deliver superior background reduction through an innovative modular design featuring removable magnetic shielding tiles – offering the heavy-duty shielding of traditional lead alternatives without the bulk. Fully customizable to any detector model or dimension, each component stays within safe lifting limits, making it ideal for portable field inspections.



SILFLEX® NEUTRON SHIELDING PRODUCTS

COMPOSITE SHIELDING EFFECTIVE FOR GAMMA AND NEUTRON FIELDS IS NOW AVAILABLE FOR YOUR DRY FUEL STORAGE CAMPAIGNS.

This high temperature shielding easily withstands the heat generated during forced helium drying which allows shielding to remain in place during the dewatered phase. A special blend of shielding material moderates and attenuates both fast and intermediate neutrons while the outer tungsten layer eliminates primary and secondary gammas. The lightweight design allows access to the weld locations without disturbing the majority of the shield package. 80-95% reductions in exposure rates have been achieved in field applications.



MADE
IN
USA



MATERIALS AVAILABLE

- PROPRIETARY BLENDS FOR ALL NEUTRON ENERGIES

MATERIAL SPECIFICATIONS

THICKNESS
2" or
2.5" w/Tungsten

DESIGN
OPTIONS
4 quadrants or
18 pie-shaped pieces

OVERALL
CIRCUMFERENCE
Dependent upon
dimension of dry cask

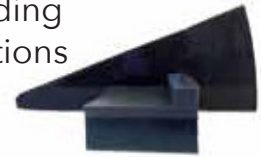
SUPERIOR SHIELDING

SHIELDS 80 TO 90% OF NEUTRON & GAMMA



SILFLEX® NEUTRON DESIGN CHARACTERISTICS

- + Effective for high-energy Gammas
- + Thermalizes high-energy Neutrons
- + Attenuates Neutrons
- + Eliminates secondary radiations
- + Withstands high-temperature during drying
- + Temperature rating to 482°F
- + Does not interfere with welding
- + Custom fit to any configurations



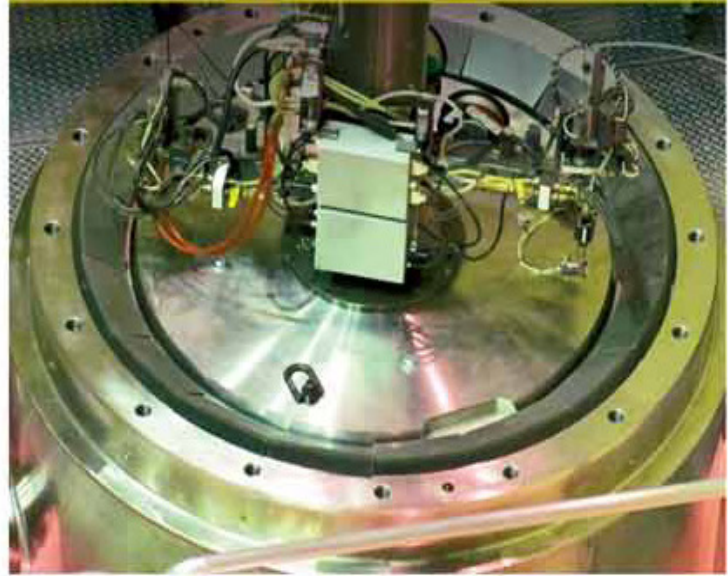
LIGHTWEIGHT DESIGN

EASY ACCESS TO WELD LOCATIONS



HEAT RESISTANT

WITHSTANDS HEAT OF FORCED HELIUM DRYING



SILFLEX® PERSONAL PROTECTION VEST

- + 20-25% DOSE SAVINGS
- + COMFORTABLE
- + FLEXIBLE
- + RUGGED

“WHEN YOU CAN’T APPLY SHIELDING TO THE SOURCE... YOU APPLY THE SHIELDING TO THE WORKERS.”

How does the Effective Dose Equivalent work with the Vest?

When using our vest the monitoring method explained in Reg Guide 8.40 must be used. It is the newest and most accurate way to assess the biological risk to a worker. The Effective Dose Equivalent (EDEex) is the sum of the products of the dose equivalent to the organ or tissue and the weighting factors applicable to each of the body organs or tissues that are irradiated. Therefore, you report the whole body dose that best represents the biological risk to the worker (EDEex), and not the highest whole body dose to the worker received (DDE). To determine the EDEex, you measure the deep dose equivalent received to the worker at each whole body location and then apply weighting factors to those areas to determine what the EDEex is to the whole body.

**VOTED
THE 2010 PROJECT
OF THE YEAR**

NUCLEAR POWER MAGAZINE

**2011 TOP INDUSTRY
PRACTICE AWARD
FOR BEST MATERIALS
PROCESS**

NUCLEAR ENERGY INSTITUTE

ANO Unit 1 EDE Monitoring Summary 1R22 Outage, Spring of 2010

The following use of RWP's contained tasks with requirements for Effective Dose Equivalent methods of monitoring for external exposure.

RWP-Task	Work Description	Max EAD Dose	EDEex Dose	Dose Differential	Man-hrs vest exposed
1430-8	Refuel Path, CRDM Work Platform	1268	595	673	90
1430-9	Refuel Path, RVC H Installation	117	96	21	12
1432-5	Refuel Canal Deep End Entry	429	244	184	13
1442-4	Steam Generation, Nozzle Dams	222	194	28	37
1450-3	In-Service Inspections	242	164	76	25
1460-2	PZR Spray Control Valve Repair	539	205	334	13
1472-4	Alloy 600 Weld Mitigation, PZR	657	583	74	102
1500-4	CRDM Change out (2) Drives	2163	968	1195	110
1501-4	RCPI Impeller Change out	624	578	46	41
1503-3	RCSTE Replacement	331	311	20	31
1504-5	Rx Bldg Drain Header Valve Cutoff	44	36	8	5

* All dose values are expressed in mrem.

REMOVABLE INSULATION SHIELDING PRODUCTS

- EFFICIENT
- SAFE
- DURABLE
- LONGEVITY
- CERTIFIED



ELIMINATE THE TYPICAL 2-STEP PROCESS

REFLECTIVE METAL INSULATION

Reflective Metal Insulation is now available with Silflex® Shielding inside, eliminating the typical 2-step process.

THERMAL INSULATION

By combining a thermal insulation system with Silflex Shielding we can eliminate the 2-step process to assist in radiation shielding and reduce heat transfer in piping applications.



REMOVABLE INSULATION HIGHLIGHTS

- Predictable & efficient thermal performance
- Quick, secure, and safe handling
- Resistant to contamination
- Easy to Clean
- Durable
- Accurate dimensions and precise fabrication
- Designed to remain in Service for Plant Lifetime (60 years)
- Tested to LOCA conditions (Reg. Guide 1.82)
- Tested for thermal properties

SILFLEX® RACKS / CARTS / ENCLOSURES

PATENTED MAGNETIC TECHNOLOGY ALLOWS FOR INCREDIBLY FAST SHIELD WALL CONSTRUCTION. RESULTING IN A SIGNIFICANTLY REDUCED EXPOSURE TO RADIATION.

Much like our shielding, racks are custom designed to meet your plants needs and are available in lightweight aluminum or steel.



SERPENTINE RACKS

PRODUCT HIGHLIGHTS

- Stock designs (barrel, Z, & Serpentine)
- Ease of transport & installation
- Multi-Shielding options
- Accessories for enhancing seismic stability
- Rapid cycle from design to delivery



BARREL RACKS

Barrel rack opens to form curved wall for Silflex® Sheet Shielding Products



Z-RACKS

Nesting aluminum 6' to 3' convertible height

SILFLEX®

CONTACT US

Direct | 619-992-3104

California Office |
855-SIL-FLEX

South Carolina Office |
864-722-9244

For more info and a full product listing,
visit us online:



[SilflexShielding.com](https://www.SilflexShielding.com)