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CBRN Decontaminationand Detoxification Systems

UP 994-150

05.07.2010

- SIMPLE
- EFFECTIVE
- ECONOMICAL

SAVING PEOPLE, PROPERTY AND THE ENVIRONMENT

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DECONTAMINATION SYSTEM

One machine
SaniJet C921

One product
BX 24

- SIMPLE
- EFFECTIVE
- ECONOMICAL

One person

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BX24

NATO Stock Number 6810-15-149-4789
for C and B Thorough-DECON Operations

BX40

NATO Stock Number *6850-15-157-8946*
Radiological decontamination

FoD

SX34

NATO Stock Number 6850-15-203-0545
CBRN Small and Large Sensitive Equipment Decontamination

BX29

NATO Stock Number 6850-15-157-8945
Personal decontamination

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What does it do? .....Why TWO in ONE

The Difference between CBRN Decontamination and Detoxification Systems

However DECONTAMINATE means **TO WASH, DISPLACE**, **REMOVE** the B and C agents from contaminated surfaces

THE AGENT IS MOVED, BUT THE PROBLEM REMAINS, AND REMAINS UNSOLVED !!

DETOXIFICATION means to **DESTROY,** in a very few minutes, B. and C. agents on site.

THE PROBLEM IS RESOLVED !!

.....TWO is better than ONE!

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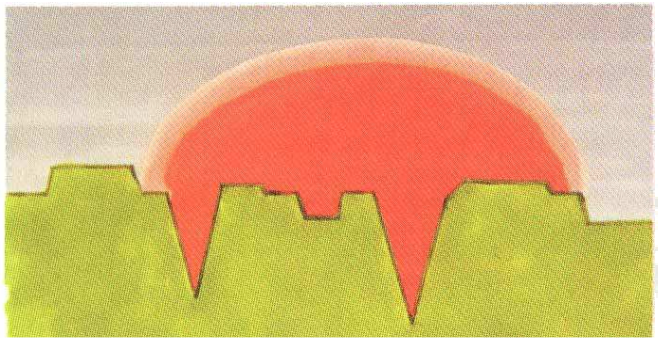
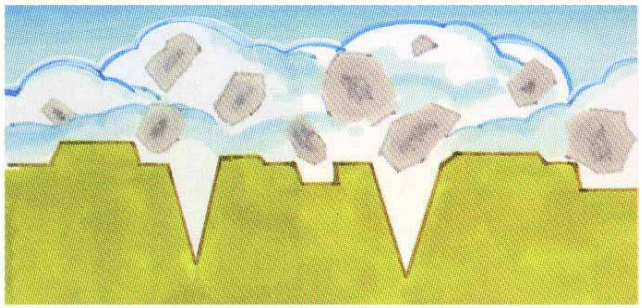
BX24

NATO Stock Number 6810-15-149-4789

for C and B thorough-DECON Operations



Contaminating agents on the surfaces



Fragments of agents decomposed by BX 24

CHEM → **✓BX 24 has been prepared to neutralize chemically the aggressive agents, thanks to its oxidation and hydrolization action.**

BIO → **✓Destroys materially or inactivates bacteria, pathogenic fungus and viruses present on surfaces and objects and rapidly attack organic substances such as protein chains or fats, in which the micro-organisms gather.**

NUC → **✓Decontamination of radiation particles due to its polarity**

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BX24

NATO Stock Number 6810-15-149-4789

for C and B thorough-DECON Operations

- **CAN BE APPLIED ON RUBBER SEALS, Certain plastics and Plexiglas.**
- **BIODEGRADE IN THE ENVIRONMENT, in both soil and ambient water systems.**
- **Single Powder ready to use**
- **Can be used through single dispersion in water at a concentration of 10-15% without the use of additives or solvents**
- **Operating temperature range: -32˚C(-26˚F) to +55˚C (131˚F) (STANAG 4370)**
- **stable for more than 10 YEARS**
- Simulation product for practical training (BX30)

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BX24
NATO Stock Number 6810-15-149-4789
for C and B thorough-DECON/DETOX Operation

Tests by International Independent Laboratories

- **SERBIA-BELGRAD - *Serbian MOD-Technical Researching Centre,*** *Mustard decontamination with Sanijet and BX 24*
- ***OPCW -***COMPARATIVE FIELD TESTING OF DECONTAMINATION AGENTS – SUMMARY REPORT- January 2009
- ***SLOVENIA – SLV Army Military Research Centre***
- ***CZ REP-VTU'O BRNO- DECONTAMINATION EFFICIENCY OF THE SX34 DECONTAMINANT PURPOSED FOR DETOXIFICATION OF SURFACES***
- **GRECIA -*MOD Chemical Lab***
- **FRANCE, CEB - MoD PARIS,** *Efficiency against Biological Warfare AGENT* **THE NETHERLANDS- TNO Prins Maurits Laboratory –** *Efficiency against GD and VX*
- **ITALY**, **Joint Technical Centre (CETLI NBC) MoD – Roma –** *Homologation of the product BX24*
- **PANAMA -U.S. Army –** *Certification of BX24 under tropical conditions*
- **USA- U.S. Army – Aberdeen Proving Ground, Maryland and Dugway Proving Ground, Utah –** *BX24 on different surfaces against VX, THD and TGD*
- **DSTL-UK MoD–** *BX 24 action against CWA*
- **BELGIUM-Engineer School and testing Laboratories – Brussels –** *Comparison between BX24 and C8 against VX and HD*
- **FRANCE, *CEB - MoD PARIS,* Ministry of Defence,** *Tests of BX24 against VX and HD*
- **SOUTH AFRICA, Armscor / Defence Research and Development Board,** *Tests of BX24 against VX and HD*
- **POLAND NBC Defence Headquarters,** *Tests of BX24 against VX and HD*
- **FINLAND, Finnish Air Force (FiAF),** *Tests of BX24 against VX and HD, Tests of BX40 on aircraft F18*

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BX30
NATO Stock Number 6810-15-149-4789

- BX 30 is a simulation product for BX 24 dedicated for practical training.

BX29
Nato Stock Number 6850-15-157-8945

BX 29 is a decontamination product for the decontamination of persons.

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BX40
NATO Stock Number *6850-15-157-8946*

- Particularly suitable for radiological decontamination of vehicles, aircraft, helicopters, etc,

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SX34 System for CBRN Small and Large Sensitive Equipment Decontamination

Nato Stock Number 6850-15-203-0545

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What do we mean by "*Sensitive Equipment*"?

By "Sensitive equipment" we mean particularly vulnerable materials in a contaminated environment that need to be reused after decontamination, such as:

- ***Avionics,***
- ***Electronics,***
- ***Electrics,***
- ***Optics,***
- ***Video surveillance system***
- ***Detection instruments***
- ***Aircraft/vehicle interiors and associated cargos.***

This are generally difficult to decontaminate due to their:

- construction characteristics,
- component materials,
- location.

Some materials may be damaged by humidity and corrosive decontamination products.

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Sensitive Equipments













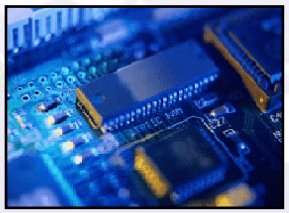


New decontamination concept

Sensitive Equipment Decontamination

" A huge technological challenge"

The effort to develop decontamination capabilities faces two challenges:

- Weaponized chemical and biological agents are designed to resist decontamination by penetrating the surfaces they touch.

- Decontaminants strong enough to deal with such agents are so harsh that they damage the sensitive equipment they are intended to cleanse.

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What is the problem with liquid decontaminants on uneven surfaces?

- **Seepage of the decontaminant and the aggressive agent into the gaps (cross-contamination)**
- **Run-off down vertical and inclined surfaces**
- **Deterioration of materials**

Cockpit of Eurofighter

Cockpit's Panel of Eurofighter

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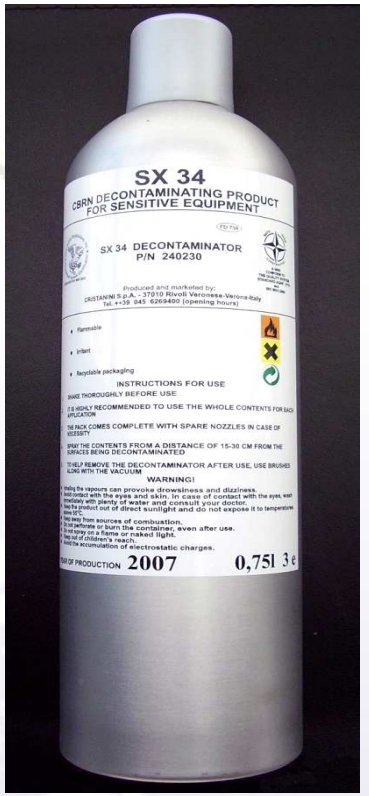
SX 34
CBRN Sensitive Equipment Decontaminant

SX34 System is a paint-like product pressurized in a can, containing:

- Sorbents
- Solvent-co-solvent system
- Propellant



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SX 34
Decontamination system for Sensitive Equipment

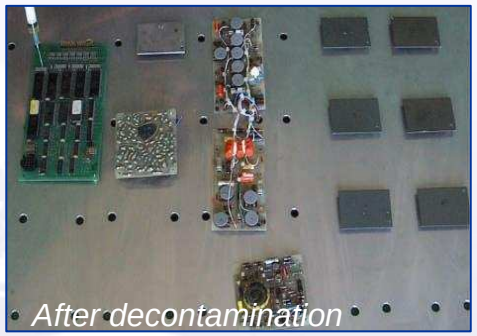
Decontamination Procedure

1. SX34 is sprayed directly on the surface like a paint;
2. The surface appears covered with a thick white layer;
3. After 20 min of reaction time it is possible to remove the layer using the dedicated vacuum cleaner;
4. If the decontamination is complete the surface will appear perfectly clean.

If whitish patches remain, repeat the Decon treatment with SX34 until clean.


After application of SX34


Removal residues


After decontamination

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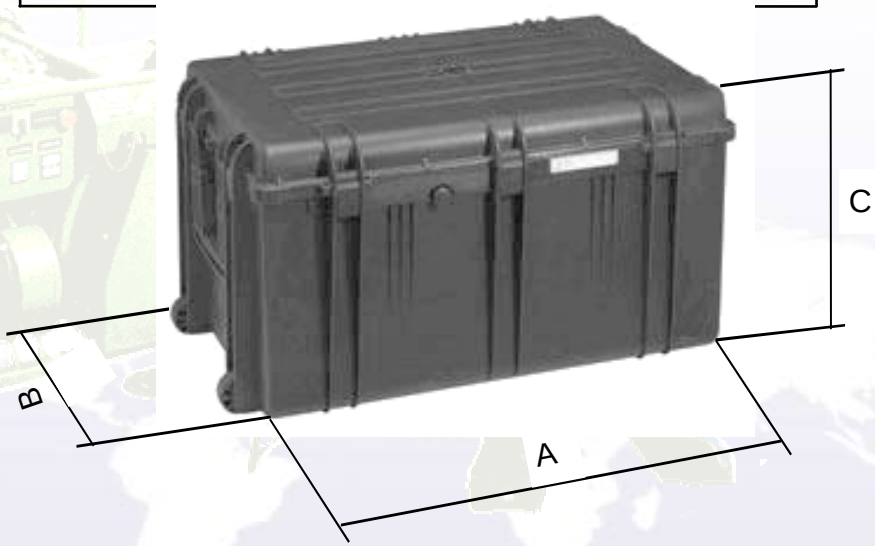
SX 34 System
for
CBRN Sensitive Equipment Decontamination

KIT SX 34 (p/n 958090183) – WEIGHT AND DIMENSIONS

A	B	C
860 mm (33,8 in.)	560 mm (22 in.)	435 mm (17 in.)
Weight- 45 kg. (99,2 lbs.)		



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SX 34 decontamination system for small and large sensitive equipment
p/n 958090183 – Nato Stock Number 6850-15-203-0545

1. N°01 Deco Vacuum (weight 9,5 kg. – 20,9 lbs. - 220÷240V. - 50÷60HZ – 1200W) – p/n 958090185 – Nato Stock Number 7910-15-203-0547;
2. N°01 storage / transportation box, drop shock resistant – p/n 958090189– Nato Stock Number 7910-15-203-0547;
3. N°10 canisters (0,75l capacity each) of SX34 decontaminant –p/n 958090184 (n. 1 canister p/n 240230 – Nato Stock Number 6850-15-203-0546).
4. N°01 HEPA and N°1 ULPA filter – p/n 958090186.
5. N°05 bags for collection of contaminated materials – p/n 958090187.
6. N°06 various accessories for access to those “hard to reach” places – p/n 958090188.
7. N°2 brushes – p/n 958090198.
8. N. 10 nozzles (– Nato Stock Number 4230-15-110-6900) – p/n 958090199.
9. N. 1 decontamination/detoxification system PSDS1,5 MIL – p/n 240425 – resistant to acids as foreseen in STANAG 4360 - Nato Stock Number 6850-15-203-0548.
10. N. 2 containers for correct dosage of the detoxification / decontamination product BX24 – (Nato Stock Number 6810-15-149-4789) - p/n 958090037.
11. N. 1 bottle (1 kg.) of detoxifying /decontaminating product BX 24 (Nato Stock Number 6810-15-149-4789)– p/n 075054036.
12. N°1 Removable decontamination box (p/n 958090242) for Deco Vacuum hose.

SX34 Assessment of Decontamination Efficacy

According to:

NATO Document - STANAG 4653 – AEP 58 Ed. 1 "Decontamination Triptych"

20.09.2005

(Expected Chemical Contamination for Inner Surfaces of military equipment: 0.2 g/m^2)

SX34 was tested to gain a comparison with standard solvent-washing and scrubbing.

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SX34 Assessment of Decontamination Efficacy
- Indepentent labs -

TEST 1. - VOP-026 Šternberk, s.p., Division VTÚO Bruno, CR, NBC Defence Testing Laboratory

- N. 3 agents (Soman (GD), VX , Yperite (HD))
- N. 4 materials
- N. 2 contamination levels (2 and 10 g/m^2)
- N. 1 decon cycle
- Comparison with standard solvent-washing and scrubbing

TEST 2. - NBC JOINT LOGISTIC, TECHNICAL CENTRE, Civitavecchia (ROMA) – ITALY

- N. 1 agent (Sulfur mustard) (HD)
- N. 9 different materials and 1 painted metal (CARC paint)
- Multiple decon cycles
- Comparison with standard solvent-washing and scrubbing

TEST 3. - CEB Test with CWA and BWA (Paris) - FRANCE

TEST 4. – CISAM - ITA JOINT HIGH RESEARCH CENTRE Test against RAD CONTAMINATION

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TEST 2. - NBC JOINT LOGISTIC, TECHNICAL CENTRE, Civitavecchia (ROMA) – ITALY

Materials of the European Fighter Aircraft (Eurofighter) Typhoon

All the EFA materials has been sorted (by the experts of the four country partners) in four lists depending on the level of chemical agents penetration resistance characteristics:

1. **Poor,**
2. **Sufficient,**
3. **Good,**
4. **Excellent**

SX34 Experiment carried out on to ten different materials belonging to the list 2 (list of interest)

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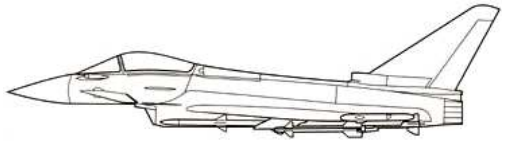
HD Decontamination by SX34 on Avionic Materials

Multiple Treatment Cycles



Contamination level: 2 g/m²

MATERIAL	Decontamination yield (%)* $\eta_{dec}= [(C_0-C_{fin})/C_0]X100$						
	η B	η 1	η 2	η 3	η 4	η 5	η 6
1. Polimethyl metacrylate sheet	99.5	99.3	100				
2. Fluorined rubber sheet type viton 6000	99.0	93.5	98.7	99.8			
3. PVC sheet	98.7	99.9	100				
4. Ultem1668A(29) sheet	98.5	98.6	99.8	99.9			
5. Fluorined rubber sheet type 6000	97.9	98.5	99.2	99.5			
6. Painted metal (CARC paint)	92.2	93.1	98.1	99.4			
7. Chloroprene sheet type 3012	43.9	66.1	78.5	87.1	89.0	93.2	
8. Fuel-resistant sheet type 2026	9.3	32.1	58.9	73.8	77.3	86.4	
9. Super chloroprene sheet type 3015	1.8	44.3	80.7	89.2	90.7	93.2	
10. Oil-resistant sheet type 2001	1.4	31.8	44.8	63.3	73.0	80.0	83.9

LoD (Limit of Detection) = 2.4 ppb
***C_0** = HD initial concentration of (ppm) (Sample A)
C_{fin} = HD concentration (ppm) after one or more decon cycles (1 to 6) or after solvent-washing (Sample B)

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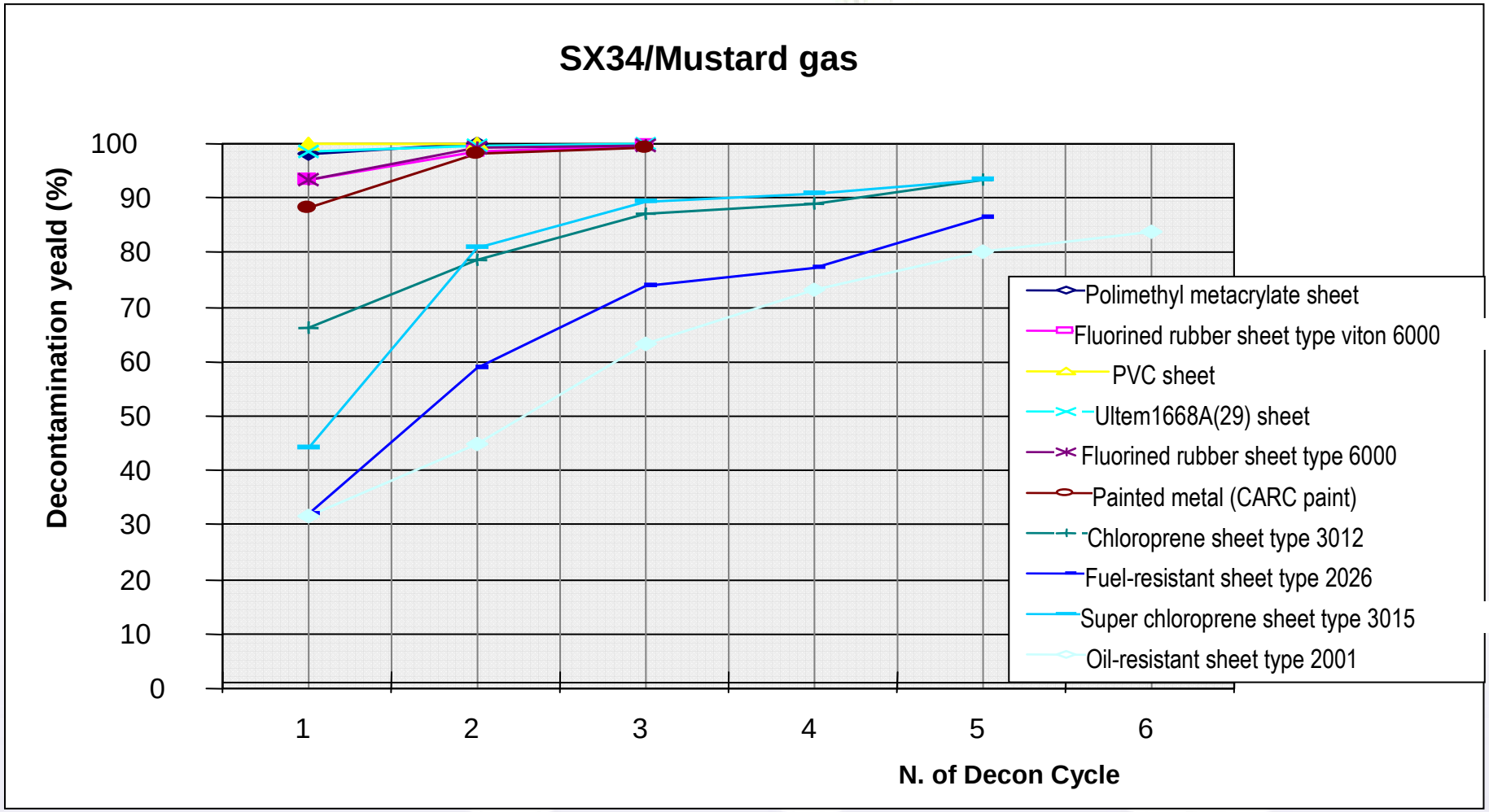
Test 2.

EFA - HD Decontamination by SX34

Multiple Treatment Cycles



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SX 34 DECONTAMINATION SYSTEM FOR SENSITIVE EQUIPMENT AND ITS EFFECTIVENESS IN RADIOLOGICAL CONTAMINATION- RN LAB TEST

1ST DRAFT RESULT DATED 14 JUNE 2010

1st Scenario.

Surface contamination of red brick / sidewalk like material) due to the accidental break of a vial containing Ra-226 at liquid status (electroluminescence bubble for mortar)

First radiometric control has given positive result and in particular a surface activity *beta-gamma* and *alfa.*

INITIAL CONTAMINATION	1st CYCLE	2nd CYCLE	AFTER THE 3rd
40 Bq/cm2	20 Bq/cm2	18 Bq/cm2	15 Bq/cm2

The final waste confined in a secure environment (the special SX 34 bag is ONLY 5l). <u>With the traditional method about 40l.</u>

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LIVE DEMO APPLICATION
SX34 SYSTEM

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SX 34 System
for
CBRN Sensitive Equipment Decontamination

ELECTRICAL INSULATION TEST

Test (n.)	Voltage before the SX 34 application KVac 50 Hz	Voltage after the decontamination with SX 34 KVac 50 Hz
1	3,1	3,1
2	2,2	2,2
3	2,0	2,0
4	3,5	3,5
5	3,1	3,1
6	2,2	2,2

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SX 34 System
Conclusion

SX34 has been designed to be a CBRN decontaminant for removing from sensitive surfaces a wide range of substances with different polarities.

I. SX34 decon tests on different materials, even non-resistant ones, achieve good yields.

II. SX34 decon results, compared with *solvent-washing,* always show better results (demonstrating extraction capability).

III. SX34 acts without any spreading of contamination or carrying of the agents in to gaps unlike liquid products.

IV. No material damages or corrosion observed, even after multiple cycles.

V. Environmentally friendly (no currently banned nor about to be banned substances; no stratospheric ozone depletion).

VI. No electrical insulation influence until 3 kVac.