



« Solidify and stabilize your liquid wastes »



Solidification of waste streams with the Nochar's polymers

Nochar products (USA) are engineered polymers allowing via **irreversible** mechanisms to absorb organic and/or aqueous liquids thus generating a **solid and stabilized waste**.

Applications

- Mixed sludge types; oil, oil-water with other solid contaminants such as salt, sand, dirt
- Pump and machine oil, various types of synthetic and standard oil
- All organic liquids including scintillation cocktails, tri-butyl phosphate (TBP)
- Aqueous liquids; water, low pH acid, high pH alkaline solutions
- Resin bed sludge, activated carbon slurry

The Nochar polymers offer an innovative solution to nuclear sites that require a treatment process to deal with complex organic/aqueous waste streams

**Multiphase liquid wastes
Suspended matter
Various composition uncharacterized**



Nochar's product :

- N910** polymer, applied to all organic liquids
Thermoplastic elastomer: styrene block co-polymer
Mechanical and chemical process
- N960** polymer, applied to all aqueous liquids
100% cross linked, co-polymer of acrylamide
Mechanical process
- N935** polymer, applied to light alcohols

IMPLEMENTATION

Quick reaction

Slow speed mixing

Ratios "liquid:polymer" vary depending upon the chemical composition of the waste

- Oil : 1:1 à 3:1
- TBP : 1:1 à 2:1
- Mixed sludge types : 2:1 à 4:1
- Aqueous solutions : 2:1 à 5:1



CEA Saclay - complex multiphase waste



CEA Cadarache - TBP/eau



ADVANTAGES

Stabilized final waste (no degradation), **non-leaching and solid**,

No heat build up, no heat release in the process; **non toxic** and **worker friendly** products

High **Resistance to radiation** - 2.7 MGray

Cobalt 60, gamma source

If apart from **organic** liquids, the liquid contains an **aqueous** phase, a **combination** of various polymer materials is used

Disposal options :

- Incineration: Cyclife (France, Sweden) and Belgoprocess (Belgium)
- Encapsulation in cement
- Direct disposal into carbon steel drums or high integrated (HIC) liner then into drums

REFERENCES

- ◆ France : ORANO, ONET
- ◆ USA : Laboratories DOE : ANL, ALNL, ORNL...
- ◆ Russia : V.G. Khlopin Radium Institute, Siberian Chemical Combine (SCC),
- ◆ China : China Institute of Atomic Energy (CIAE), CNTC, ..
- ◆ UK : Nuclear Decommissioning Authority; Sellafield, Dounreay, Harwell Sites
- ◆ Belgium : SCK- CEN
- ◆ Italy : SOGIN
- ◆ Canada : Canada Nuclear Labs (CNL), Ontario Power Generation
- ◆ Armenia, Australia, Brasil, Norway, Romania, Slovakia, Slovenia, South Africa, Sweden..

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