



WACOMP

Waste Volume Reduction Compactor

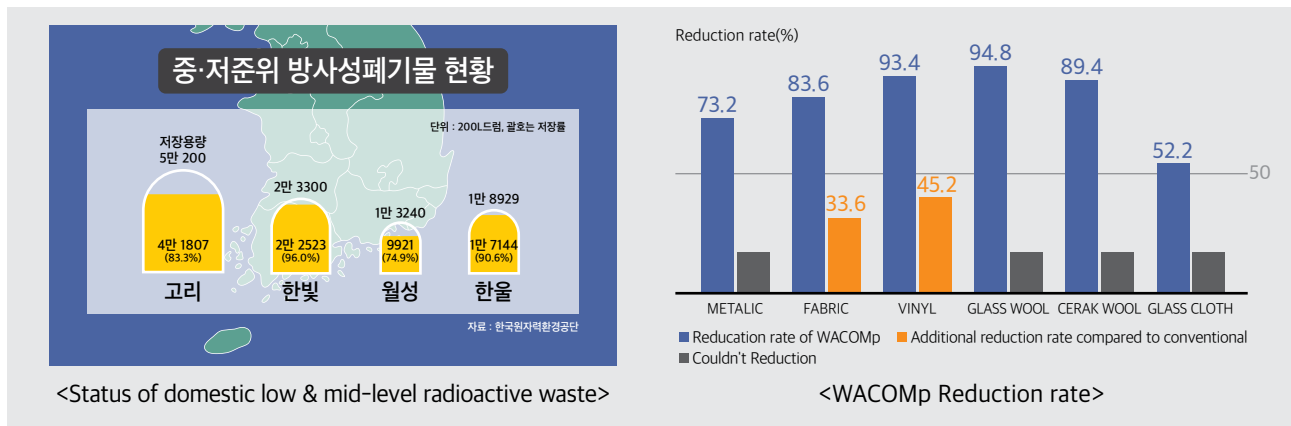
WACOMp is?

WACOMp is an equipment for reduction of radioactive wastes generated during the operation of nuclear power plants and decommissioning process. It is the first equipment based on hydraulic pressure(200ton), which is designed for 200L DAW(Dry Active Waste) drum of radioactive waste disposal.



Needs

The shutdown and decommissioning of old nuclear power plants have generated a large amount of radioactive wastes globally. This has brought to the attention of the necessity of specialized facilities and equipments that can reduce radioactive wastes.



Technology

Conventional radioactive waste compressor operated using 10tons of pressure, even it can deliver up to 30tons of pressure. Metallic wastes could only be disposed by simply cutting it. The conventional radioactive waste compressor could not prevent the swelling of compressible waste. Consequently, waste management was kept with low efficiency.

Innovation

- Compaction of metallic wastes
- Bending function to prevent swelling
- Exclusive Facility for 200L disposal drum
- Once through treatment / disposal facility for metallic and compressible waste
- Independently Separate compression sleeve to proceed waste(Patent No. 10-1561522)

Specifications

- **Usage:** metal, fiber, resin, vinyl, etc.
- **Treatment time:** 5 minutes per cycle
- **Compression performance:** Reduction rate 75%(Metal 70%, Paper 82%, Fibers 86%, Vinyls 84%)
- **Compression capacity:** 120kg once(based on metal)
- **Compression method:** Hydraulic press(220 tons)

Operation(How it works)

- Possibility to process metals, textile / vinyl / paper, instruments and parts

- ① Opening inlet → injection waste in sleeve
- ② Hydraulic compression(220ton) operation in the sleeve
- ③ Cake discharging and re-expansion prevented bending
- ④ Drum charging(no need backfill due to cake standardization)



- Fiber & Metal waste layered loading(No height change for 6 months after loading)

- Ⓐ Fiber cakes 85% loaded
- Ⓑ 2 Fiber cakes, 4 Metal cakes loaded
- Ⓒ 3 Fiber cakes, 3 Metal cakes loaded
- Ⓓ 4 Fiber cakes, 2 metal cakes loaded



WACOMp Economic effect analysis

* Disposal cost: 14 mil. Won/drum

Classification		Waste drum units [2years average]	Remarks
Conventional compressor	Number of Waste drum	1,710 drum	Radio active waste
	Disposal cost	23.9 bil. Won	-
WACOMp	Number of Waste drum	1,036 drum	35% additional reduced(average)
	Disposal cost	15.5 bil. won	35% reduced

(Based on data, announced by KHNP in 2017)

- It is possible to reduce minimum of 674drums / year compared to conventional compressor. This could bring at least \$9 million cost reduction in disposal.
- Due to reduction in waste drum units, it is possible to expand temporary storage capacity of storage area.

WACOMP

방사성폐기물 감용 압축기 (Waste Volume Reduction Compactor)

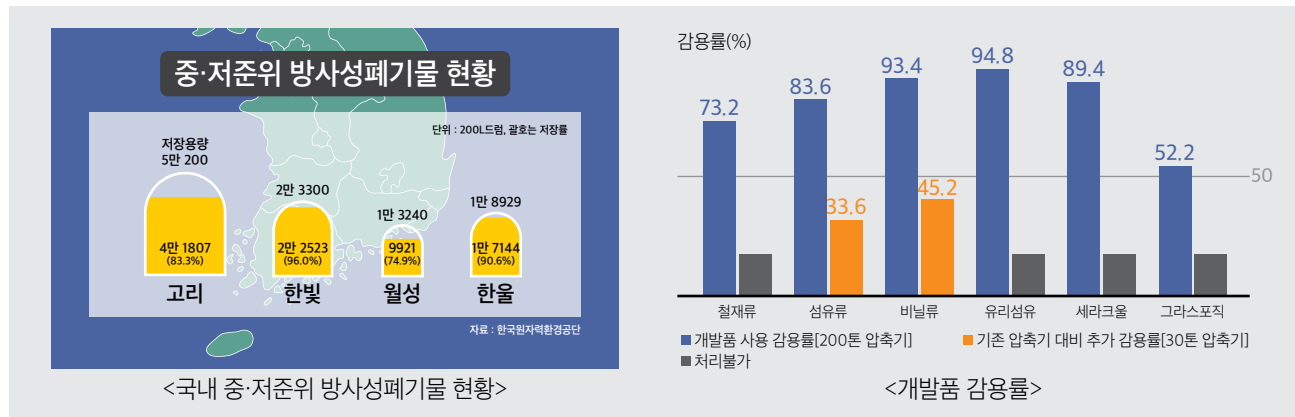
WACOMP란?

WACOMP는 중·저준위방사성폐기물의 부피를 줄이는 유압식 압축기로 상용원전 및 원자력 관련 시설에서 발생하는 운영 및 해체 폐기물의 감용처리를 위한 설비 - 국내 최초 220ton 급의 방사성 압고체처분드럼 전용 압축기



필요성

전 세계적으로 원자력발전소의 운영정지 및 노후원전 해체로 다량의 중·저준위 방사성폐기물이 발생, 원전, 연구 및 산업계에서 발생하는 방사성 폐기물 처분드럼의 처분량을 줄이기 위한 방사성 폐기물전용 감용 설비 필요



사용현황

국내 원전 및 연구 / 산업계에서 사용중인 기존의 압축설비는 30톤 압축기로 폐기물 처리처분 운영상 실제 10톤의 압력을 사용중, 금속성 폐기물은 단순 절단 처리 / 처분, 압축성 폐기물은 재팽창 현상으로 관리 효율성이 떨어짐

WACOMP의 강점

- 현장에서 실시간 금속성 폐기물 압축가능 (금속류, 계기류, 밸브류, 기타 금속구조물)
- 압축성 폐기물 재팽창 현상 방지 밴딩기능 (Spring back 방지, 드럼 내 채움률 만족)
- 200L 방사성폐기물 처분드럼 전용 설비 (320L 및 해체폐기물용으로 다변화 가능)
- 금속 및 압축성 폐기물 처리 / 처분 단일설비 (사용자 운영 용이성 극대화)
- 독립된 별도의 압축 전용 슬리브에서 폐기물 압축 (200L드럼 손상 방지, 특허 10-1561522)

WACOMp 사양

- 압축방식: 유압프레스 (220ton)
- 압축용량: 1회 120kg (금속기준)
- 압축성능: 금속류 70%, 종이류 82%, 섬유류 86%, 비닐류 84%
- 처리대상: 금속, 섬유, 비닐 등 (잡고체)
- 처리시간: 1회 폐기물 압축 시 (5분)

WACOMp 운영

- 금속류, 섬유 / 비닐 / 종이류, 계기 및 부품류 처리가능

- ① 투입구 개방 → 슬리브 내 폐기물 투입
- ② 슬리브 내 유압 압축(220ton) 운전
- ③ 압축물(Cake) 배출 및 부풀음 방지 밴딩
- ④ 드럼 장입(폐기물 케익 규격화로 뒷채움재 불필요)



- 금속류, 섬유류 이중 교차 적재 (적재후 6개월 동안 적재 높이 변화 없음 확인)

- ㉠ 섬유류 85% 적재
- ㉡ 섬유류 2개 케익, 금속류 4개 케익 적재
- ㉢ 섬유류 3개 케익, 금속류 3개 케익 적재
- ㉣ 섬유류 4개 케익, 금속류 2개 케익 적재



WACOMp 경제적 효과 분석

* 드럼 당 처분비용: 14,000천원 기준

구분		드럼 발생량 [2년 평균 적용]	비고
개발품 사용 전 [30톤 압축기]	폐기물 드럼 수	1,710 드럼	잡고체
	처분비용	239.4억원	-
개발품 사용 전 [200톤 압축기]	폐기물 드럼 수	1,036 드럼	잡고체, 평균 35% 추가 감용
	처분비용	145억원	35% 절감

(한국수력원자력(주) 2017년 방사성폐기물 발생 / 처리량 기준)

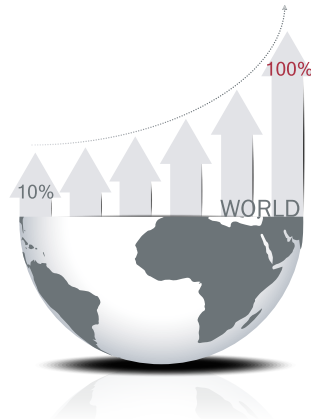
- 기존 압축설비 대비 연간 최소 674드럼 감용 (90억원 이상 처분비용 절감 가능)
- 폐기물 드럼 발생량 감소에 따라 임시 저장고 저장능력의 확대 가능

ORION EnC

Company Information

ORIONEnC is a nuclear engineering and manufacturing company in the service area of on-line radiation monitoring and inspection system, radioactive waste and nuclear spent fuel management technology, industrial ultrasonic testing device and configuration for NPP management technology for nuclear power plant

ORIONEnC was established at April. 2012, having many experts in the field of nuclear industry. OrionEnC continues to make every effort to support continuous R&D programs to acquire top-level source technology in nuclear industry and to develop technologies & goods matching with present/near future domestic & world market and to take offer much better engineering service with top-level technology



Representative *Unjang Lee*

Business area

1. Service of configuration management technology for construction & operation of nuclear power plant and other chemical / refinery plants
2. Direction, inspection and supervision of technical specification and quality control of drawings, documents and goods from engineering and manufacturing companies. (Especially, management for the team of the 3rd party Inspection in nuclear industry)
3. Engineering and treaty service of waste management for low- and intermediate level radioactive waste disposal.
4. Service of radioactivity monitoring for environmental and industrial application of nuclear materials.
5. Engineering technology service for management of spent nuclear fuels and high level radio-wastes
6. Engineering service for decommissioning nuclear power plants and facilities.
7. Engineering, procurement, construction and commissioning services for solar energy system(including solar seawater desalination plants)



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