

Report

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Subject/Title

HTR
Nuclear Waste
Fuel Plant

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Project

HTR FANP
HTR-N (EC-Project)

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Summary^{*)}

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This report serves as an information to the members of WP4 of the HTR-N (EC-Project: FIKI-CT-2000-00020) and is foreseen as an input to the SINTER network. Here in also available to the members of HTR-F.

Abstract:

Dealing with the question of waste today all kinds of waste are taken into consideration developing a new reactor line. So this report gives a brief overview to the amounts of waste fabricating fuel particles. Due to the different waste categories in Europe the data - coming from the experience in Germany in the 70ies and 80ies – has to be handled carefully, e.g. in comparison with LWRs.

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1. Introduction

The data in this report are based on the fabrication of German spherical fuel elements consisting of LEU TRISO coated particles embedded in graphite – manufactured by NUKEM (former HOBEG) and used in the AVR and the proof tests for the HTR Module (Siemens design of the 80ies).

2. Assumptions

- Production capacity about 300000 fuel spheres per year.
- Nuclear waste is defined as material that contains or is contaminated with uranium greater than “allowed” levels. (“allowed” may differ from country to country).
 - Up to a special amount of uranium the waste can be treated as “low and intermediate level waste (short lived)”.
 - Due to processes for recovery of uranium for process optimisation “long lived” waste can be prevented.

3. Waste Quantities (without optimisation)

Solid Waste (per year)

Compactable	low active / short level	32 m ³	Prior to compaction (compaction ratio 5 to 10:1)
Non-compactable	low active / short level	5 m ³	
Silicon rubber moulds	cleared waste	16 t	
Tar from carbonising	cleared waste	12 t	

Liquid Waste

Ammonium nitrate solution	cleared waste	120 m ³
Sodium chloride solution	cleared waste	35 m ³
Low active aqueous effluent	low active	2000 m ³
Industrial waste	industrial	