



Transports of Irradiated Fuel pins

Bairiot Xavier

Transnubel

Dessel, Belgium

Labergri Fabien

Robatel

Genas, France



Transnubel



BG18 packaging



R72 packaging



Transnubel



BG18 packaging :

- Experience during the 3 last years



R72 packaging :

- Description
- The 2 different canisters
- The allowed contents
- The high burnups fuel pins
- The leaking fuel pins
- The cold tests
- The first use in Avogadro



Transnubel



The BG 18

Approved and used in the last 3 years in :

- Germany
- Switzerland
 - Spain
 - France
 - Sweden
- Denmark

14 transports were successfully executed

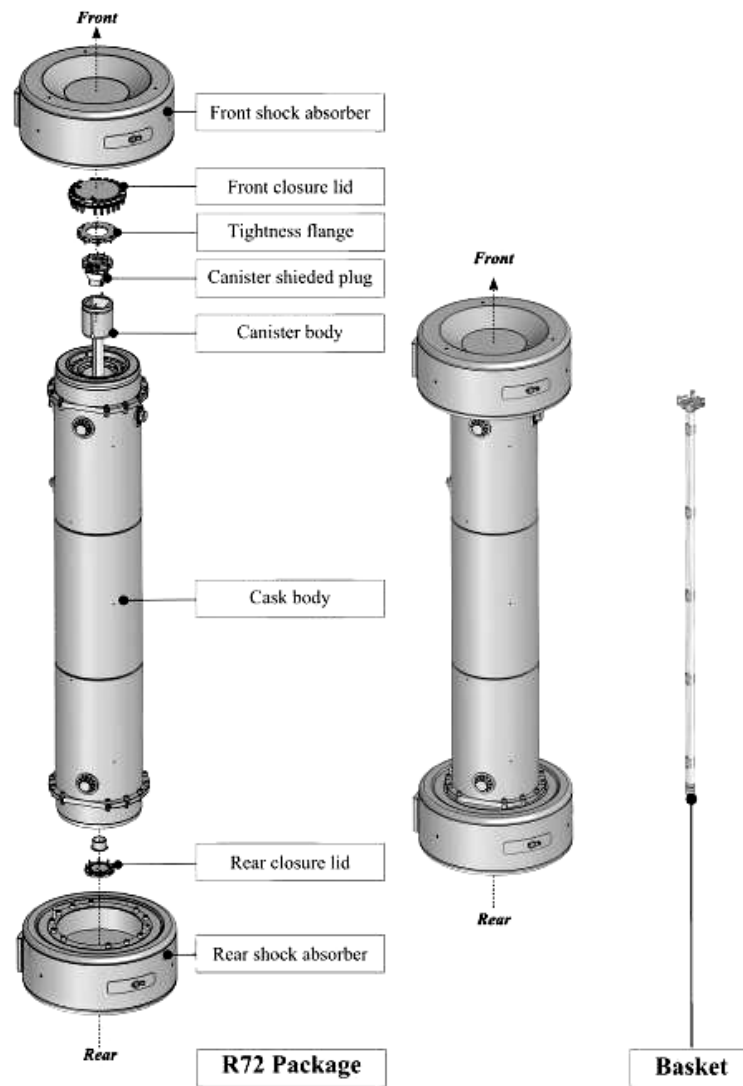
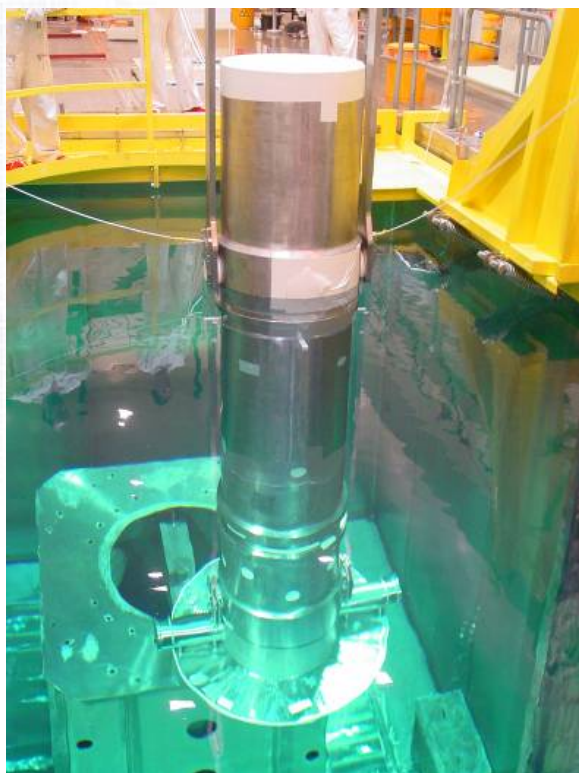




Transnubel



The R 72





Transnubel



The R 72

- Dimensions :

 - Length :*

 - inner length of package : **5 330** mm

 - outer length of package : **5 445** mm

 - total length (with shock absorbers) : **6 254** mm

 - Package diameter :*

 - inner diameter : **140** mm (cavity)

 - outer diameter : **950** mm (with neck)

 - outer diameter (with shock absorbers): **1680** mm

- Empty weight :

 - 21** T (shock absorbers included)

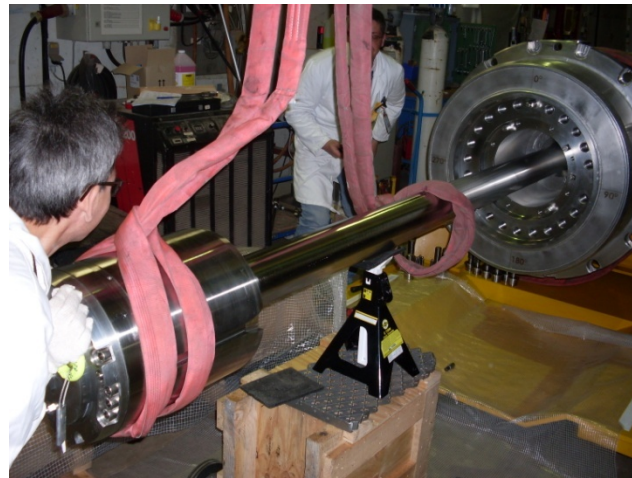
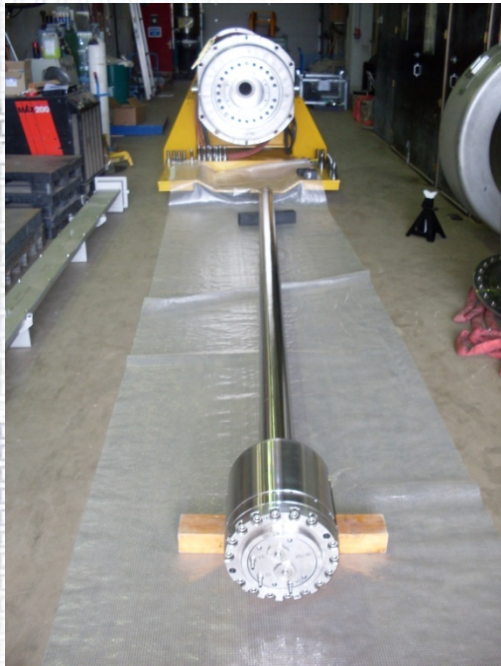
 - 18,5** T (without shock absorbers)



Transnubel



The R 72

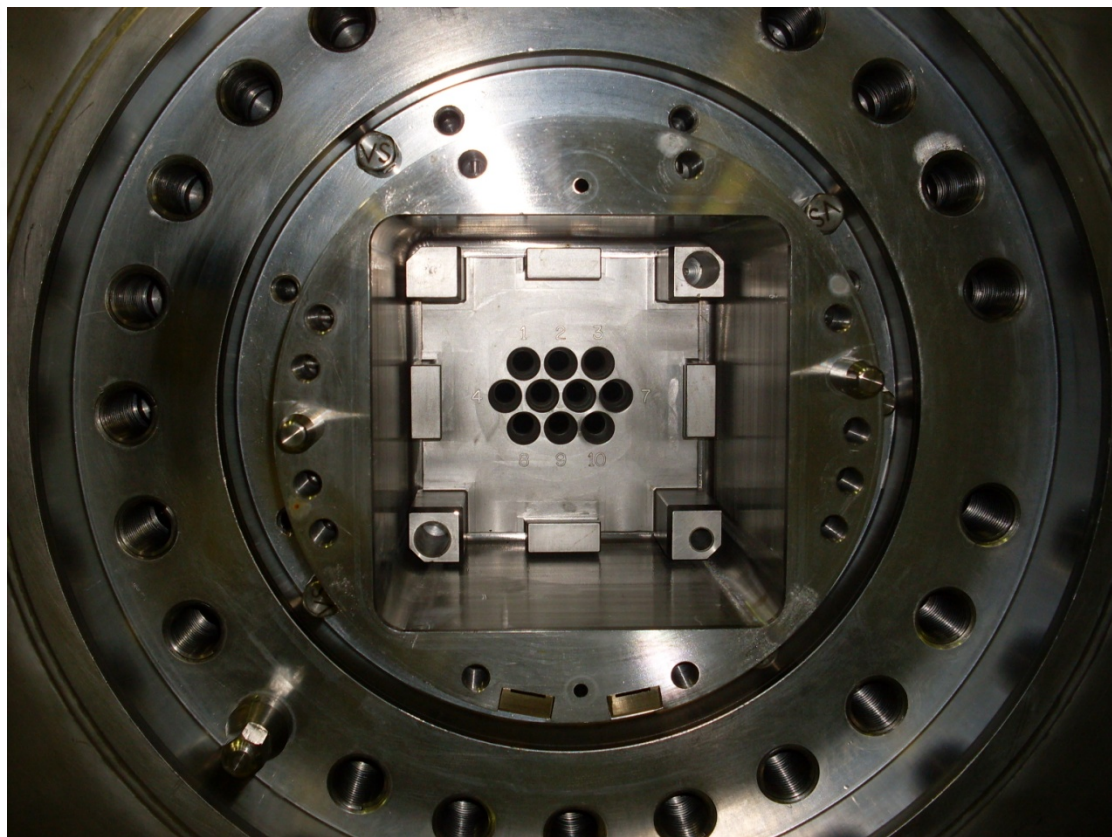




Transnubel



The R 72





1st allowed content

	UOX - A	MOX - A
Maximum irradiation MWd/tmli	85 000	75 000
Enrichment % U235	max 5	max 0,7
% Pu content	-	max 11
Cooling time	min 6 months	min 6 months
Active length	4300 mm	3700 mm
Heavy metal , 10 pins	22,6 kg	19,4 kg



2nd allowed content

	UOX - B	MOX - B
Maximum irradiation MWd/tmli	100 000	100 000
Enrichment % U235	max 10	max 1,5
% Pu content	-	max 15
Cooling time	min 6 months	min 6 months
Active length	4300 mm	3700 mm
Heavy metal , 10 pins	25,6 kg	25,6 kg



allowed content

	UOX - B	MOX - B
Maximum irradiation MWd/tmli	100 000	100 000
Enrichment % U235	max 10	max 1,5
% Pu content	-	max 15
Cooling time	min 6 months	min 6 months
Active length	4300 mm	3700 mm
Heavy metal , 10 pins	25,6 kg	25,6 kg



Transnubel



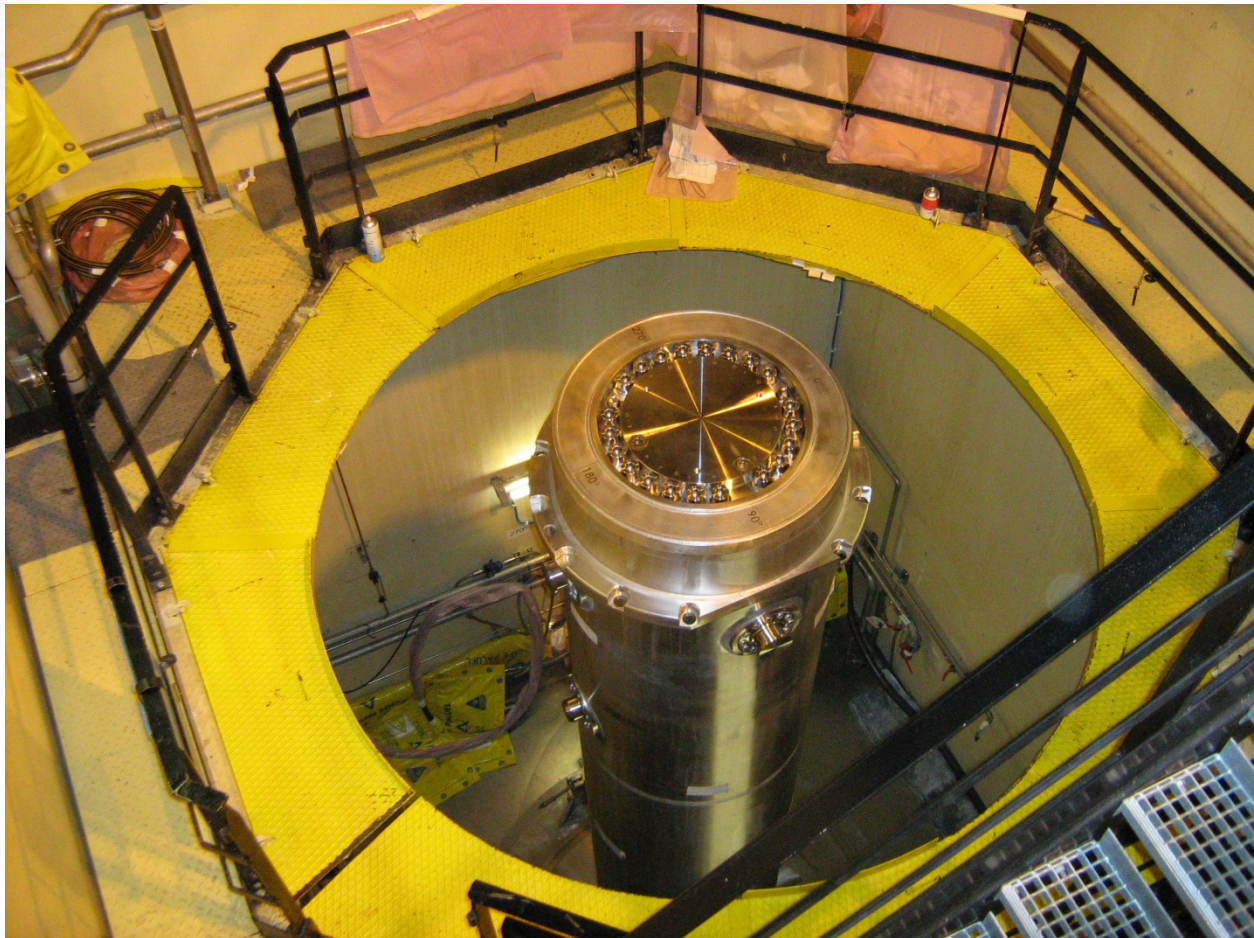
The R 72



Transnubel



The R 72

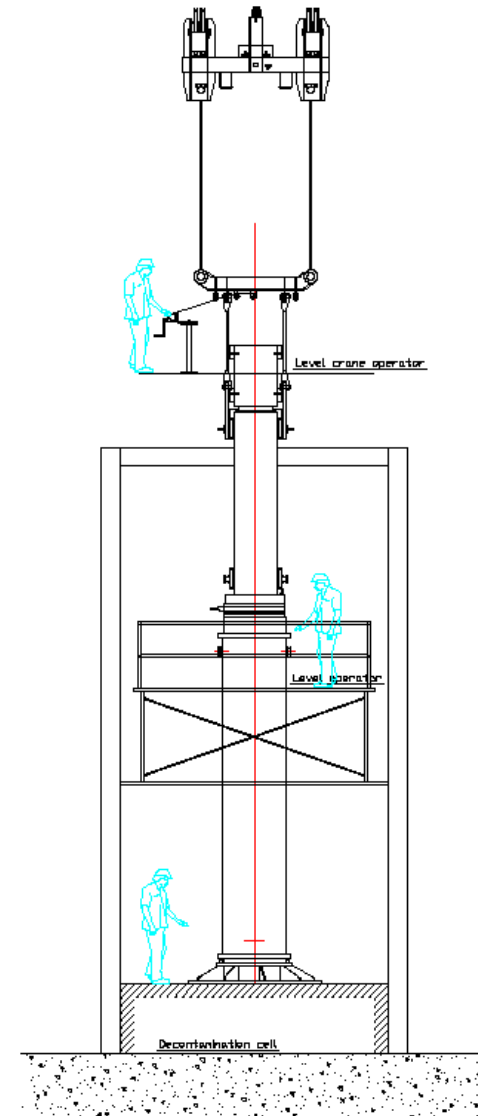




Transnubel



The loading in Avogadro





Transnubel



The loading in Avogadro





Transnubel



- The transport of spent fuel pins is secured in the long term by an approved and recent packaging
- The flexibility for loading and unloading has already been tested during the first months of use of the packaging in 2010
- More contacts will be necessary between the Industry and the Authorities to find a way forward for the high burnup fuel and leaking fuel