

A photograph of a Passiv Autocatalytic Recombiner (NIS-PAR) device. The device is a cylindrical metal component with a chain attached to its side, mounted within a red-painted metal frame. The background shows industrial machinery and a large metal door.

NIS-PAR

Passiv Autocatalytic Recombiner

Optimum hydrogen control under all conditions

Passive Autocatalytic H₂ Recombiners are an economical and effective solution to mitigate the effects of hydrogen release during postulated accidents in nuclear power plants.

The NIS-PAR is also an efficient solution to deplete hydrogen in other facilities where hydrogen comes from radiolysis or another source. As a result, explosions will be securely prevented.



Siempelkamp

NIS Ingenieurgesellschaft

The NIS-PAR works completely passive and is self-starting also at low temperatures and under wet conditions. The catalytic material palladium is applied on the spherical surface of pellets made from aluminum oxide with a diameter of about 4-6 mm. It is filled in cartridges made from slotted stainless steel sheets. Depending on the NIS-PAR type, different numbers of such cartridges are arranged vertically in a stainless steel housing. A hood protects against spray water, chimney elongations boost the depletion rate.

Up to now a large number of international test programs were conducted with the NIS-PAR module, which verify the development results:

- NRC in Sandia National Laboratory /US
- Consolidated Edison in Wyle-Laboratory/US
- EPRI / EDF in the KALI-H2-test facility of the CEA in Cadarache/France
- EDF / IPSN in Cadarache/France
- EU and NIS in MC (Model Containment) by Battelle in Frankfurt/Germany
- Toshiba / Hitachi/Japan
- OECD in the THAI-test facility in Frankfurt/Germany



There are various NIS-PAR module options for the flexible adaption to the local needs and for the needed H2 depletion rates in the NPP. NIS delivers complete solutions from one hand:

- Planning
- Necessary model calculation
- Assistance with approval procedures
- Manufacturing and delivery
- Assembly
- Training of operating staff for conduction of periodic inspections

