

FIRST REVIEW MEETING

HEAT4U PROJECT

July 19th 2013
Paris, GDF SUEZ

Gas Absorption Heat Pump solution
for existing residential buildings



Under the EU's Seventh Framework Programme for Research



WP4 – LAB PERFORMANCE VERIFICATION
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The Consortium



Achievement of WP4

TASK	TITLE	STATUS
Task 1	GAHP technology test protocols review and improvement	Completed. Deliverable D4.1 sent. Few aspects to be verified during lab tests.
Task 2	Test facilities preparation	Ongoing. Laboratories are under construction.
Task 3	Test of GAHP Appliance and System performance	Beginning soon.
Task 4	GAHP Safety and environmental assessment	Ongoing. Deliverable D4.2 expected for month 24. All the tests already carried out.

WP4 - Task 4.1

- Revision of the European standard for absorption appliance testing (prEN12309) within the TC299
- Analysis of the prEN12309: critical aspects found, some clarified, other to be further investigated
- Development of a test protocol for the GAHP based on the prEN12309
- Definition of additional test conditions for a complete GAHP characterization (in coordination with WP6)
- Extension of the test protocol to include the DHW production

WP4 - Task 4.2

- Test facilities:
 - at Politecnico di Milano: completed. Beginning of test activities: end of July
 - at Fraunhofer ISE: contract to be awarded soon. Expected beginning of test activities: end 2013
- Technical challenges (w.r.t. new standards at part load):
 - high precision water temperature and flow control (tank + mixing valves)
 - water flow measurements precision (separate circuits for low and high flow)
 - real time control and data analysis (dedicated software on PC)
 - requirement on temperature limits and on stability of test conditions met
- Specific features for gas units:
 - gas circuit with fuel flow measurements of high precision
 - NH₃, CO, CH₄ sensors for safety issues

WP4 - Task 4.2



Climate chamber under construction

WP4 - Task 4.2



System for air and water temperature and flow control and measurement

WP4 - Task 4.3

Test plan

- Full load conditions
- Part load conditions for the average climate and high temperature (55°C) appliance:
 - Continuous operation
 - On-off cycling
- Seasonal performance calculation in heating mode
- Additional (not included in standard) test conditions:
 - characterization / modelling
 - DHW tapping cycles

WP4 - Task 4.4

- Leakage tests were made by ZAG at the Measurement place in Training Centre for Civil Protection and Disaster Relief of the Republic of Slovenia
- Cumulative and instantaneous concentration tests have been made according to standard protocols
- Concentration measurements:
 - Concentration is harmful only in vicinity of GAHP (ammonia is lighter than air)
 - Concentration depends also on type of damage (nozzle in our case): concentration of leakage from small nozzle is lower, but last longer
 - Direction of concentration depends on direction of wind.

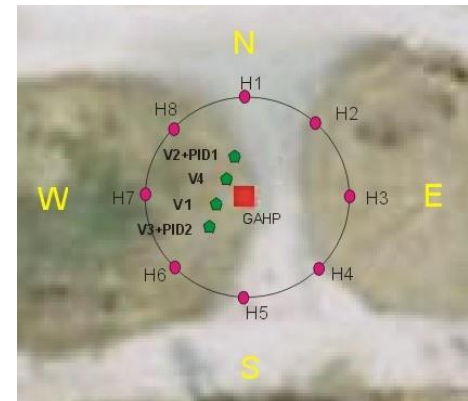
WP4 - Task 4.4



Test set up



Location of probes - Hydriion



Location of PID measurement probes and accumulative probes

WP4 - Task 4.4



Cloud of ammonia during test P4



Concentration on NH₃ on location 17 during test P4



Damage of lamellas during test P4

Future plans

- Task 4.1 – clarification of the last critical issues on prEN12309
- Task 4.2 – completion of the test device at Fraunhofer ISE
- Task 4.3 – GAHP performance assessing:
 - test according to EN12309 and according to additional conditions in the two laboratories;
 - comparison of the results from the two laboratories;
 - Creation of a performance map in cooperation with WP6
- Task 4.4 – complete the report (Deliverable D4.2)