



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

DENSO WAVE Inc.  
Fluorine (09813A)

**Report No. DE 2006-1161**

DUPLICATE

Statement of  
Qualification

Single product  
Hydrogen Peroxide  
Absorption/Desorption

Customer	DENSO WAVE Inc. 1, Yoshiike, Kusaki, Agui-cho, Chita-gun 470-2297 Aichi Japan
Component tested	
Category:	Materials
Subcategory:	Plastics
Product name:	Fluorine (09813A) (manufacturing date: 4/2020; color: brown; serial number: PLATE_2020-09)

Hydrogen peroxide absorption / desorption

Methodics:	VDI 2083 Part 20 The norms stated generally refer to the version valid at the time of the tests.
Air-conditioned laboratory environment:	Temperature: .....22 °C ± 0.5 °C
Test procedure parameters:	<ul style="list-style-type: none"><li>Emission test cell volume: ..... 16.5 cm<sup>3</sup></li><li>Exposed surface area: ..... 33 cm<sup>2</sup></li><li>H<sub>2</sub>O<sub>2</sub> vapor concentration: ..... 50 ± 20 ppm (V)</li><li>Exposure duration: ..... 60 min</li><li>Air exchange rate during aeration:..... 50 min<sup>-1</sup></li></ul>

Test result / Classification

The hydrogen peroxide absorption/desorption of Fluorine (09813A) was investigated with the stated test parameters. Using the procedure laid down in VDI 2083 Part 20, the following test result was obtained:

Ø k-value [min]	Standard deviation [min]	Classification
0	0	non-absorptive

The k-value represents the required decay time to reduce the hydrogen peroxide vapor concentration measured at the beginning of the aeration phase to one tenth of the original concentration. The material classification is based on three separate measurements. The blank value of the test setup is subtracted from each measurement value. The medium k-value is transferred to the following classification:

- ≤ 5 min: ..... non-absorptive
- > 5 - ≤ 15 min: ..... fast
- > 15 - ≤ 60 min: ..... medium
- > 60 min: ..... slow
- Not determinable: ..... catalytic activity

The k-value can only be used to make a comparative material assessment. Provided the maximum hydrogen peroxide vapor concentration during material exposure is within the defined limit, it does not affect the calculated k-values.

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

Detailed information and parameters of the test environment can be found in the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA	DE 1409-725 Report No. first document	Stuttgart, July 15, 2015 Place, date of first document issued
Department of Ultraclean Technology and Micromanufacturing	DE 2006-1161 Report No. current document	Stuttgart, November 4, 2020 Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA	