



## Examination report

Diesel fuel filter

SWK 2000/130

Part A : Differential pressure curves

Part B : Water separation

Reference no. : 3.1.2-46/84  
Order no. : 47 87 85/01

Essen, 08.04.94  
Sci/Dke

## Report

on the examination of diesel fuel filter  
SWK 2000/130

Client ..... Willibrord Lösing  
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Examination object ..... Diesel fuel filter SWK 2000/130  
with a 30 µm filter element

Aims of the examination ..... A. Measurement of the pressure loss  
curve  
  
B. Measurement of the degrees of  
water separation

## **Part A**

### ***Differential pressure curves***

#### **1. Examination object**

The diesel fuel filter SWK 2000/130 to be examined is designed for installation on the suction side. The nominal flow rate is 130 l/min.

Extra light heating oil with a density of 0.845 g/cm<sup>3</sup> (at 15 °C) was used as the test oil.

#### **2. Examination commission**

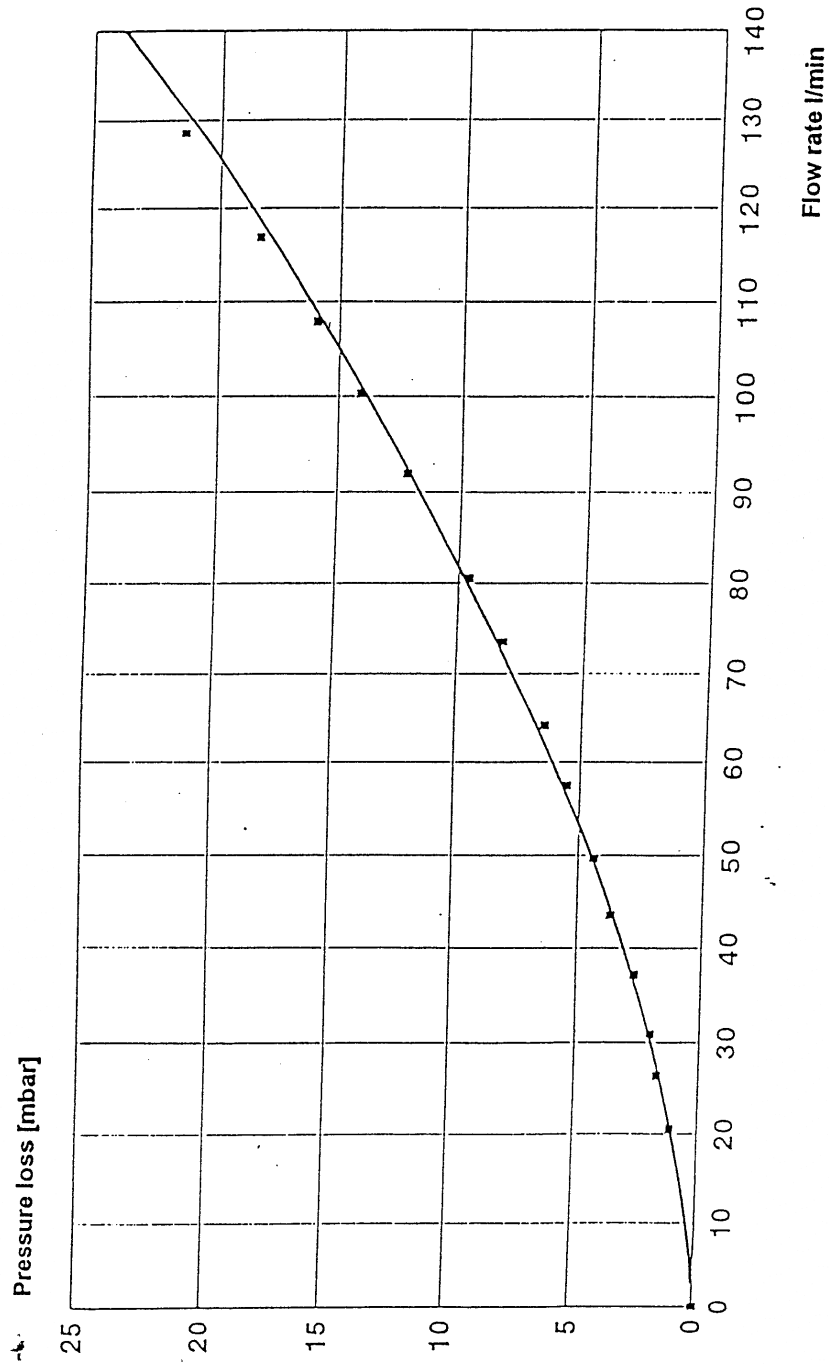
Measurement of the pressure differentials up to the nominal flow rate of 130 l/min. with a 30 µm filter element and the plotting of the differential pressure curve ( $\Delta p = f(V)$ ).

#### **3. Results of the examination**

The differential pressure curve is shown in Annex 1 of Part A of this examination report.

Annex

### Pressure loss measurement on a diesel fuel filter



Type of filter: Separ SWK 2000/130

Filter element no. 01830

## **Part B**

### **Water separation**

#### **1. Examination object**

The diesel fuel filter SWK 2000/130 to be examined is designed for installation on the suction side. The nominal flow rate is 130 l/min.

Extra light heating oil with a density of 0.840 g/cm<sup>3</sup> (at 15 °C) was used as the test oil.

The water was continuously fed into the filter's suction line and intermittently extracted from the filter casing without interruption of the test run (cf. section 2: Notes).

#### **2. Examination commission**

Determining the degrees of water separation using 10 µm and 30 µm filter elements.

- Feeding water into the test oil stream : 0.2 % by volume
- Test oil flow rates : 80 l/min., 90 l/min., 100 l/min., 110 l/min., 120 l/min. and 130 l/min.
- Test time : 60 mins in each case
- Sampling after 15 mins, 30 mins, 45 mins and 60 mins.

#### **Notes**

1. Determination of the degrees of water separation at 120 l/min. and 130 l/min. test oil flow rates was performed using filter elements which were divided by a central web.

2. At 120 l/min. and 130 l/min. test oil flow rate the test run was interrupted every 10 mins and the water was drained from the casing with the vent open, cf. Annex 2 to part B of this examination report.

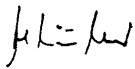
### 3. Results of the examination

The results of the measurements are shown in Annexes 1 and 2 to part B of this examination report.

In the calculation of the degree of separation only the water rate specifically fed into the test oil stream, namely 0.2 % by volume, was taken into account.

#### Annex

For the contents



Dipl.-Ing. R. Schüler

**Water separation**  
 Diesel fuel filter SWK 2000/130

Filter element : 30 µm  
 Test oil flow rate : 80 l/min, 90 l/min, 100 l/min und 110 l/min  
 Feeding water : 0.2 % by volume

Point when sample taken [min]	Sample no. <sup>1)</sup> [-]	Water content in test oil stream [mg/kg]	Water content of the sample [mg/kg]	Degree of water separation [%]
-	<b>1st 0-Probe</b>	0 + 45	45 - 45 = 0	100
15	130-30-80-15	2381 + 45	52 - 45 = 7	99,71
30	130-30-80-30	2381 + 45	48 - 45 = 3	99,87
45	130-30-80-45	2381 + 45	51 - 45 = 6	99,75
60	130-30-80-60	2381 + 45	51 - 45 = 6	99,75
-	<b>2nd 0-Probe</b>	0 + 45	45 - 45 = 0	100
15	130-30-90-15	2381 + 45	48 - 45 = 3	99,87
30	130-30-90-30	2381 + 45	45 - 45 = 0	100
45	130-30-90-45	2381 + 45	46 - 45 = 1	99,96
60	130-30-90-60	2381 + 45	46 - 45 = 1	99,96
-	<b>3rd 0-Probe</b>	0 + 45	45 - 45 = 0	100
15	130-30-100-15	2381 + 45	49 - 45 = 4	99,83
30	130-30-100-30	2381 + 45	49 - 45 = 4	99,83
45	130-30-100-45	2381 + 45	49 - 45 = 4	99,83
60	130-30-100-60	2381 + 45	49 - 45 = 4	99,83
-	<b>4th 0-Probe</b>	0 + 48	48 - 48 = 0	100
15	130-30-110-15	2381 + 48	50 - 48 = 2	99,92
30	130-30-110-30	2381 + 48	50 - 48 = 2	99,92
45	130-30-110-45	2381 + 48	49 - 48 = 1	99,96
60	130-30-110-60	2381 + 48	50 - 48 = 2	99,92

<sup>1)</sup> Structure of sample no.: type of filter - size of pores [µm] - test oil flow rate [l/min] - point when sample taken [min]

**Water separation**  
**Diesel fuel filter SWK 2000/130**

Filter element : 30 µm 2)  
 Test oil flow rate : 120 l/min  
 Feeding water : 0.2 % by volume

Point when sample taken [min]	Sample no. 1)	Water content in test oil stream [mg/kg]	Water content of the sample [mg/kg]	Degree of water separation [%]
0				
10	<u>1st 0-Probe</u> 130-30-120-10	0 + 32 2355 + 32	32 - 32 = 0 31 - 32 = 0	100 100
10				
20	<u>2nd 0-Probe</u> 130-30-120-10	0 + 29 2348 + 29	29 - 29 = 0 23 - 29 = 0	100 100
20				
30	<u>3rd 0-Probe</u> 130-30-120-10	0 + 30 2391 + 30	30 - 30 = 0 24 - 30 = 0	100 100
30				
40	<u>4th 0-Probe</u> 130-30-120-10	0 + 30 2356 + 30	30 - 30 = 0 23 - 30 = 0	100 100
40				
50	<u>5th 0-Probe</u> 130-30-120-10	0 + 24 2359 + 24	24 - 24 = 0 23 - 24 = 0	100 100
50				
60	<u>6th 0-Probe</u> 130-30-120-10	0 + 26 2364 + 26	26 - 26 = 0 24 - 26 = 0	100 100
60	<u>7th 0-Probe</u>	0 + 29	29 - 29 = 0	100

1) Structure of sample no.: type of filter - size of pores [µm] - test oil flow rate [l/min] - point when sample taken [min]  
 2) Filter element with central web



**Water separation**  
**Diesel fuel filter SWK 2000/130**

Filter element : 30 µm 2)  
 Test oil flow rate : 130 l/min  
 Feeding water : 0.2 % by volume

Point when sample taken [min]	Sample no. 1) [-]	Water content in test oil stream [mg/kg]	Water content of the sample [mg/kg]	Degree of water separation [%]
0				
10	<u>1st 0-Probe</u> 130-30-130-10	0 + 26 2315 + 26	26 - 26 = 0 35 - 26 = 9	100 99,61
10	<u>2nd 0-Probe</u> 130-30-130-10	0 + 28 2381 + 28	28 - 28 = 0 29 - 28 = 1	100 99,96
20	<u>3rd 0-Probe</u> 130-30-130-10	0 + 30 2405 + 30	30 - 30 = 0 33 - 30 = 3	100 99,88
30	<u>4th 0-Probe</u> 130-30-130-10	0 + 27 2358 + 27	27 - 27 = 0 30 - 27 = 3	100 99,87
40	<u>5th 0-Probe</u> 130-30-130-10	0 + 29 2372 + 29	29 - 29 = 0 36 - 29 = 7	100 99,70
50	<u>6th 0-Probe</u> 130-30-130-10	0 + 27 2397 + 27	27 - 27 = 0 35 - 27 = 8	100 99,67
60	<u>7th 0-Probe</u>	0 + 32	32 - 32 = 0	100

1) Structure of sample no.: type of filter - size of pores [µm] - test oil flow rate [l/min] - point when sample taken [min]  
 2) Filter element with central web