STAUFF®

FILTRATION TECHNOLOGY

2003

STAUFF

Laser Particle Counter - LasPac 1

Quality and Service Worldwide

Australia
Stauff Corporation (Pty.) Ltd.
P.O.Box 227 , 24-26 Doyle Avenue,
Unanderra Wollongong , N.S.W
2526 AUSTRALIA
Tel: +61 2 42 71 18 77
Fax: +61 2 42 71 84 32

Brazil
Stauff Brasil Ltda.
Av. Gupê 10767
Galpão 2 – Bloco A
Barueri – São Paulo – CEP 06422-120, BRAZIL
Tel: +55 (0)11-4789-9020
Fax: +55 (0)11-4789-9021

Canada
Stauff Canada Ltd.
866 Milner Avenue
Scarborough , Ontário M1B 5N7 , CANADA
Tel: +1 416 282 46 08
Fax: +1 416 282 30 39

China
Stauff International Trading (Shangai) Co., Ltd.
Shangdian Mansion, Pudong
331 , Binzhou Road
200126 Shangai, CHINA
Tel: +86 21 58 45 65 60
Fax: +86 21 58 45 66 80

France
Stauff S.A.
Z.I. de Vineuil-Blois Sud
230, Avenue du Grain d'Or
41354 Vineuil-cedex, FRANCE
Tel: +33 2 54 50 55 50
Fax: +33 2 54 42 29 19

India
Stauff India Pvt. Ltd.
Gat. No. 2340,
Pune-Nagar Road, Wagholi, INDIA
IND-Pune - 412027
Tel: +91 20 705 19 90
Fax: +91 20 705 19 89

Italy
Stauff Italia S.R.L.
Via Pola 21/23, I-20034
Birone di Giussano, ITALY
Tel: +39 0362 31 21 13
Fax: +39 0362 33 55 36

New Zealand
Stauff Corporation (NZ) Ltd.
Unit J. 150 Harris Road, P.O. Box 58517
Greenmount Auckland-NEW ZEALAND
Tel: +64 9 271 4812
Fax: +64 9 271 4832

United Kingdom
Stauff UK Ltd.
332, Coleford Road Darnall
Sheffield, S 9 5 P H, ENGLAND
Tel: +44 1142 518 518
Fax: +44 1142 518 519

USA
Stauff Corporation
7 Wm. Demarest Place
Waldwick, NJ – 07463, USA
Tel: +1 201 444 78 00
Fax: +1 201 444 78 52

Distributors and warehouses in all industrial countries.

Walter Stauffenberg GmbH & Co. KG

P. O. Box 17 45 · D-58777 Werdohl
Im Ehrenfeld 4 · D-58791 Werdohl
Tel.: +49 (0) 23 92 9 16-0
Fax: +49 (0) 23 92 25 05
E-mail: sales@stauff.com
Internet: http://www.stauff.com

Stauff Filtration Technology

Stauff Filtration Technology offers a complete range of filtration products and services that will provide the system designer or user with the highest level of contamination control demanded by today's most sophisticated applications. Products include pressure filters, return line filters, elements, spin on filters suction strainers, and filler breathers for various hydraulic, lubrication and fuel oils.

Stauff has the technical expertise to provide superior filter element designs for the Stauff original filter housings and also for the interchange element market. Stauff manufactures more than 10,000 different elements. Many of these are designed to fit into filter housings produced by other companies while maintaining or surpassing the original performance.

The "Stauff Contamination Control Program" includes the diagnostic services including fluid sampling and laser particle counting products needed to monitor the system contamination level.

Stauff, through its global network of wholly owned companies and technically qualified distributors, is ideally placed to assist its customers in the total contamination process providing a well balanced filtration solution.

Laser Particle Counter — Page

Laser Particle Counter - LasPac 1

The ***new*** **STAUFF Laser Particle Counter I** is a microprocessor-controlled 8-channel particle counter designed for monitoring the degree of contamination of mineral based hydraulic fluids. In contrast to other commercially available particle counters, the **LasPaC I** is characterized by a few special features.
The readings from the **LasPaC I** will immediately indicate the condition of the hydraulic system, the data will be documented, and you will be able to intervene at an early stage in order to prevent wear and damage to the components in the hydraulic system. This does not only minimize repair costs, but also reduces overall equipment downtime.

1. Mobile ➢ Light weight and handy
With its comparatively low weight of 8.5 kg *(18.7 lbs)* – only 18 kg *(40 lbs)* with its rugged aluminum case – the device is well suited for use in the field, even in areas that are difficult to access.

2. Quick results ➢ ease of operation
Operator input is conducted via touch-screen and function keys. The control features of the particle counter have been designed so that measurements can be done quickly and easily. User defined measuring programs can be entered and stored with password protection.

3. Flexible ➢ multi-range calibration (optional) to ISO 11 171 and ISO 4402 (for NAS 1638)
The LasPaC offers several optional calibrations (see Ordering Code): “N” for New calibration ISO 11171, Cleanliness Levels according to ISO 4406 (1999) and SAE AS4059 (2001) “O” for Old calibration ISO 4402, Cleanliness levels according to ISO 4406 (1991) and NAS 1638 (1991) “B” for New and Old Calibration. In this case, the LasPaC is set to the latest calibration per ISO 11 171 by default. However, if users wish, they can switch to the older ISO 4402 calibration for comparision. The device also evaluates readings based upon NAS 1638 classes.

4. For any type of application ➢ various pressure stages
The LasPac I features two integrated pressure ranges for 0 to 6 bar *(0 to 87 PSI)* low pressure and 5 to 420 bar *(73 to 6000 PSI)* high pressure. This allows oil samples to be taken from pressureless systems or reservoirs without any other equipment. Many other products available today require special add-ons or pressure cartridges which need to be recharged. The STAUFF TEST hose which are provided with the device, allow easy connection to common test couplings (16 x 2).

5. Global use ➢ variable voltage supply
The integrated power supply unit provides a voltage range of 110 V ... 240 V.

6. Independent use ➢ storage-type battery

The integrated rechargeable battery makes it possible to perform on-the-spot measurements, even in cases where a direct connection to an external power supply is not possible. The measured data are stored and can be transferred to a computer later on if necessary.

7. "In black and white"➢ built-in printer

The integrated printer supports printouts in the field, thus providing immediate documentation.

8. Making the connection ➢ downloading via a serial interface

The measured data can be downloaded onto any PC or notebook via the device's serial interface, supported by a convenient downloading software. Further processing and storage of the data is done in Microsoft Excel® with the use of specially designed macros. The prepared forms provide for easy transfer of the data. The integrated diagrams represent the data graphically for more clarity. Likewise the data can be assembled to a trend analysis. With Microsoft Excel®, it is possible to edit the data as required, e.g. with the customer's logo.

9. Always up-to-date ➢ an integrated clock

An integrated and rechargeable battery-operated clock provides the exact date and time which are shown on every printout. In addition, every download of measured data is marked with date and time. The precise time of measurement is thus documented on all printouts and for all the data stored.

10. Adaptable ➢ software updates

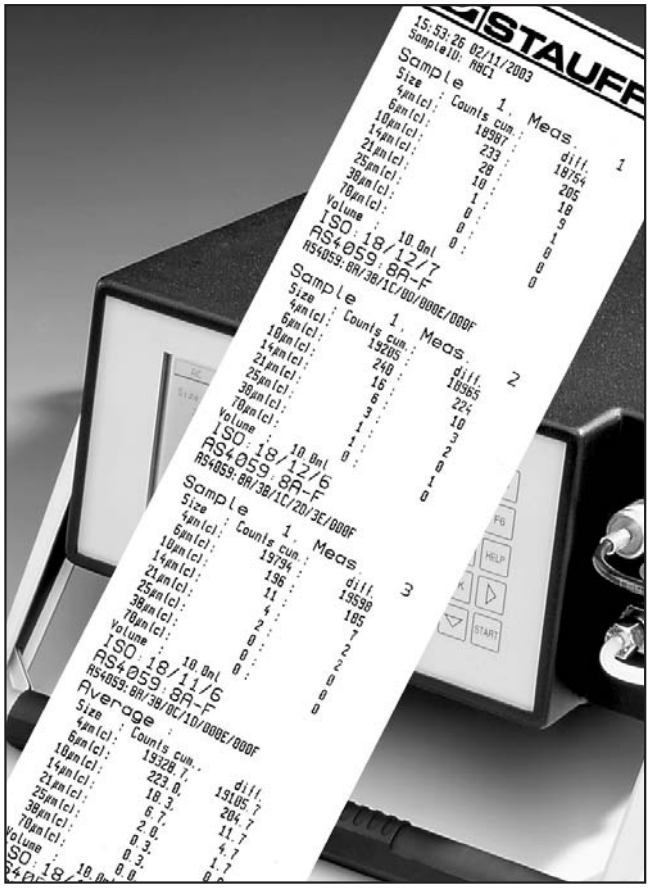
The serial interface ensures flexibility for future developments in terms of calibration, evaluation and output. Moreover, software updates can be installed on the particle counter, without any problems.

11. 100% Coverage

The fluid passes a vitreous measuring cell and is rayed by a laser beam. This laser beam is evaluated at the backside of the cell. Dimensions and the number of particles are calculated from electronic impulses transformed by the shadows. With many other particle counters only a part of the measuring cell is lighted by the laser beam, the particles are only partially registered and the result is projected. In contrast the cell of the LASPAC is completely examined and all particles are registered. Inaccuracies as a result of the projections are avoided.

12. Robust ➢ Ceramic Piston Pump

The integrated piston pump works in both directions: it outputs the fluid in "low pressure" mode and controls the flow in "high pressure" mode. Ceramic pump components are compatible with various fluids, and are resistant to wear caused by abrasive solid contaminants.



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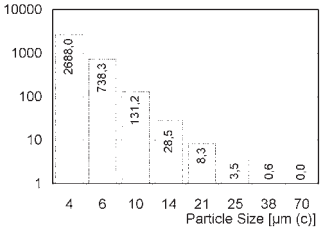
LasPaC I Report

according to ISO 11171

Sample ID / No.	: ABC-1	
Service Hour	: 23.581 h	
Oil Temperature	: 41°C	
Notes	: Control	
Test Date	: **18. Nov 2002 13:40**	
Report Date	: 20. Nov 2002	
Profile Name	: Std. High Press.	
Meas. Volume	: 10 ml	
Analysis Volume	: 1 ml	
ISO 4406	: 19 / 17 / 12	(Calibr. ISO 11 171: 1999)
AS 4059	: 9 A-F (9A/8B/6C/7D/6E/6F)	(Calibr. ISO 11 171: 1999)
ISO 4406	: 19 / 17 / 13	(Calibr. ISO 4402: 1991)
NAS 1638	: 9 (9/8/8/7/8)	(Calibr. ISO 4402: 1991)

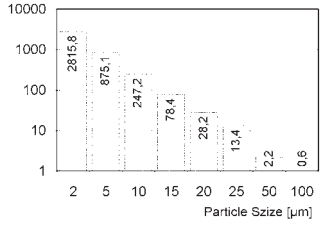
Analysis ISO 11 171

Particle Size	Particle / ml
> 4.0 µm (c)	2688,0
> 6.0 µm (c)	738,3
> 10.0 µm (c)	131,2
> 14.0 µm (c)	28,5
> 21.0 µm (c)	8,3
> 25.0 µm (c)	3,5
> 38.0 µm (c)	0,6
> 70.0 µm (c)	0,0



Analysis ISO 4402

Particle Size	Particle / ml
> 2.0 µm	2815,8
> 5.0 µm	875,1
> 10.0 µm	247,2
> 15.0 µm	78,4
> 20.0 µm	28,2
> 25.0 µm	13,4
> 50.0 µm	2,2
> 100.0 µm	0,6



11. Technical Data

Microprocessor-controlled 8-channel particle counter for contamination monitoring of mineral based hydraulic fluids. The particle counter is equipped with a laser sensor. The orifice of the sensor has a cross-section of 500 x 500 µm. The maximum concentration is 24,000 p/ml at a flow rate of 25 ml/min (ISO 4406 Code 23). The sensor can be calibrated in accordance with the following standards:

Calibration according to ISO 11 171 (1999):
4 ... 70 µm(c) relating to ISO 4406: 1999
and SAE AS4059: 2001

Calibration according to ISO 4402 (1991):
1 ... 100 µm relating to ISO 4406: 1987
and NAS 1638

Channels	1	2	3	4	5	6	7	8
ISO 11171 in µm (c)	4	6	10	14	21	25	38	70
ISO 4402 in µm	2	5	10	15	20	25	50	100

Fluid compatibility
Mineral oils and phosphate esters
(other fluids please call, e.g. Skydrol)

Pressure and viscosity
High pressure 5 bar ... 420 bar *(73 ... 6000 PSI)*
Viscosity up to 300 mm^2/s
Low pressure 0 ... 6 bar *(0 ... 87 PSI)*
Viscosity up to 160 mm^2/s
(Through the integrated pump)

Power supply
Voltage range: 110 V ... 240 V AC
10 V ... 36 V DC
Rechargeable battery operation: 2,5 h
(battery charger is integrated in the counter)

Working conditions
Fluid temperature: 0 ... 90°C *(32 ... 194°F)*
Ambient temperature: 0 ... 40°C *(32 ... 104°F)*
Humidity 20% ... 85%, non-condensing, 95% by storage

Data output:
Cumulative particle counts, as well as cleanliness classes to ISO 4406 / SAE AS4059 and ISO 4406 / NAS 1638 depending on calibration (see ordering code).

Integrated printer

Integrated memory: 500 standard measurements (consisting of 3 single measurements)

Download software
Downloading and storage of the data in ASCII format, as well as the evaluation and the further processing in Microsoft Excel® 2000.

Dimensions (w x h x d) in mm
Particle counter 310mm x 310mm x 145mm
(12.2 in x 12.2 in x 5.7 in)
Case 410mm x 720mm x 200mm
(14.3 in x 18.5 in x 7.1 in)

Weight
Particle counter 8.5 kg *(18.7 lbs)*
Particle counter with case and accessories
18 kg *(40 lbs)*

12. LasPaC I Kit includes:

1 x LasPaC I particle counter
1 x Aluminum trolley (case with wheels)
1 x Power supply connection cable
1 x Serial connection cable for connection to PC or notebook
1 x Software Download and Report
2 x STAUFF TEST hose (l = 1,5 m) for input/output
1 x Suction hose transparent (l = 1,5 m)
1 x Adapter low pressure hose to test coupling
1 x Control pen with plastic pin for the touchscreen
5 x Spare paper roll for built-in printer (order code SPR LasPaC)
1 x Operating instructions, in German and in English

13. Order number code

LasPaC I - N - A

LasPaC I
Standard type

N	New Calibration ISO 11 171
O	Old Calibration ISO 4402
B	Both - New and Old Calibration

Electrical connection cable	
(none)	Standard ”Schuko“ connection plug (German standard)
A	North American connection plug

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Notes

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Notes

THIS IS STAUFF

RESPONSE AND FLEXIBILITY • COMPETENT SERVICE • PROMPT DELIVERY •
ENSURED QUALITY • FRIENDLY SERVICE • PROVEN IN PRACTICE

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Australia
Stauff Corporation (Pty.) Ltd.
P.O.Box 227 , 24-26 Doyle Avenue,
Unanderra Wollongong , N.S.W
2526 AUSTRALIA
Tel: +61 2 42 71 18 77
Fax: +61 2 42 71 84 32

Brazil
Stauff Brasil Ltda.
Av. Gupê 10767
Galpão 2 – Bloco A
Barueri – São Paulo – CEP 06422-120, BRAZIL
Tel: +55 (0)11-4789-9020
Fax: +55 (0)11-4789-9021

Canada
Stauff Canada Ltd.
866 Milner Avenue
Scarborough , Ontário M1B 5N7 , CANADA
Tel: +1 416 282 46 08
Fax: +1 416 282 30 39

China
Stauff International Trading (Shangai) Co., Ltd.
Shangdian Mansion, Pudong
331 , Binzhou Road
200126 Shangai, CHINA
Tel: +86 21 58 45 65 60
Fax: +86 21 58 45 66 80

France
Stauff S.A.
Z.I. de Vineuil-Blois Sud
230, Avenue du Grain d'Or
41354 Vineuil-cedex, FRANCE
Tel: +33 2 54 50 55 50
Fax: +33 2 54 42 29 19

Germany
Walter Stauffenberg GmbH & Co. KG
P.O. Box 1745,
D-58777 Werdohl, GERMANY
Tel: +49 (0) 23 92/916-0
Fax: +49 (0) 23 92 25 05

India
Stauff India Pvt. Ltd.
Gat. No. 2340
Pune-Nagar Road, Wagholi
IND-Pune - 412027
Tel: +91 20 705 19 90
Fax: +91 20 705 19 89

Italy
Stauff Italia S.R.L.
Via Pola 21/23
I-20034 Birone di Giussano
Tel: +39 0362 31 21 13
Fax: +39 0362 33 55 36

New Zealand
Stauff Corporation (NZ) Ltd.
Unit J. 150 Harris Road, P.O. Box 58517
Greenmount Auckland-NEW ZEALAND
Tel: +64 9 271 4812
Fax: +64 9 271 4832

United Kingdom
Stauff UK Ltd.
332, Coleford Road Darnall
Sheffield, S 9 5 P H, ENGLAND
Tel: +44 1142 518 518
Fax: +44 1142 518 519

USA
Stauff Corporation
7 Wm. Demarest Place
Waldwick, NJ – 07463, USA
Tel: +1 201 444 78 00
Fax: +1 201 444 78 52

Globally available through distributors in all industrial countries

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