Eskom	TD & RM **RECORD COVER SLIP**	Reference No.: KFI-RE-001 Revision: 1 | Page: 1 Associated Procedure: KAA-830

ALLOC. CENTRE	DOCUMENT NUMBER		REV	FOR OFFICE USE ONLY
		1523035	0	

TITLE	COVER SLIP COMPLETED BY
EQUIVALENT: ACTIVATED CARBON FILTER. (REV.0)	C HAUPT
	DOCUMENT TYPE: RECORD | SECURITY CLASS: RESTRICTED
	AUTHOR ORIGINATOR: R KANNEMEYER

TRIGRAMME (STATUS COMMENTS)

1/2 DVC 001 PI;
1 TEG 001 PI,
2 TEG 002 PI

ADDRESSEE

REF. DATE (CCYYMMDD)	KIS / SHELF LOCATION	NO. OF PGS	RETENTION PERIOD
2018/05/31	PT095	33	YEARS 40

REFERENCE NUMBERS

M006/18E
S2018-0313

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C HAUPT - SPEC ENG Z VANDA - MECHANICAL MAINTENANCE C CARELSE - BUYING M MOEKETSI - PLANT ENG E SHAND - TMG M ROGERS - TMG L KIRSTEN - TMG Z NACKERDIEN - TMG XOLELWA BOOI - TMG C MICHILLIES - CONFIG R KANNEMEYER - SPEC ENG	SIGN ..... Haupt DATE 2018/07/11	SCANNED REGISTERED	HARDCOPY (PAPER) ✓ DISC RADIOGRAPH TAPE OTHER

NOTES

Eskom	Equivalency Study	Nuclear Engineering

Title: **Activated Carbon Filter**

Document Identifier:	**M006/18E**
Alternative Reference Number:	**NA**
Area of Applicability:	**U**
Revision:	**0**
Total Pages: (Excluding Attachments)	**21**
Next Review Date:	**March 2021**
Disclosure Classification:	**CONTROLLED DISCLOSURE**

Compiled by	Reviewed by	Authorised by
R Kannemeyer	**SL Swartz**	**AMA Stephanus**
Snr. Technician	**Technologist**	**Manager, Specification Engineering**
Date: 2018-05-31	Date: 2018-05-31	Date: 2018-05-31

ADDITIONAL CLASSIFICATION INFORMATION

Business Level:	**4**
Working Document:	**3**
Importance Classification:	**Applicable to Nuclear Safety**
NNR Approval:	**N/A**
Safety Committee Approval:	**N/A**
ALARA Review:	**N/A**
Functional Control Area:	**Specifications, Programmes & Sciences**
Business Area:	**Nuclear Engineering**
Discipline:	**Specification Engineering**

Content

1. Introduction

The OEM has confirmed that the Acticarb range of fitlers have been supersceded with the Acticarb 2 range of filters. Consequently, the Acticarb 1606.36.00 has been replaced by the Acticarb 1606.40.00.

2. Scope

Original Installed Equipment:	NA
Previous Replacement:	Acticarb 1606.36.00
New Proposed Replacement:	Acticarb 1606.40.00

2.1 Evaluation between:

Acticarb 1606.36.00

AND proposed replacement,

Acticarb 1606.40.00

2.2 Equipment Functional Location:

1/2 DVC 001 PI

1 TEG 001 PI, 2 TEG 00 2 PI

2.3 Function of the Equipment:

The filter performs trapping of radioiodines.

2.4 Reason for change:

Product evolution.

2.5 Classification:

System:	DVC	TEG
Classification Number:	0328/87Q	0319/87Q
Safety:	NSF	NSF
Seismic:	NC	NC
Quality:	Q4	Q4
Environmental:	NEV	NEV
Importance:	AR	SR

3. Applicability

This document applies to Koeberg Operating Unit (KOU).

3.1 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

3.1.1 Normative

[1] Camfil Nuclear, Safety and Protection Catalogue – 2012

[2] ACTICARB 2 brochure

[3] DSG-314-057 – Activated Charcoal Iodine Filters

[4] KBA1217D00012 – Supplier's Instructions Manual – Filtration of Air

3.1.2 Informative

[5] DSE – TEG

[6] DSE – DVC

[7] DSE – DVN

3.2 Definitions

[1] NC (seismic) – No seismic requirement (Not to be confused with ASME Safety Class 2, NC Rating).

3.3 Abbreviations

Abbreviation	Explanation
TEG	Gaseous Waste Treatment System (BNI System)
DVC	Control Room Air Conditioning
NSF	No Safety Function
NEV	Environmental Classification for all Mechanical Components / parts
SR	Safety Related
I&C	Instrumentation and Control
KOU	Koeberg Operating Unit
DSE	System Description Manual
COC	Certificate of Conformance
OE	Operational Experience
TMG	Training Material Group
TTG	Technical Training Group
DDR	Document and Drawing Revision
GA	General Action
SAP	Systems Applications & Products
KI	Potassium iodide
TEDA	Triethylenediamine

4. Equipment Requirements

4.1 Service Conditions

4.1.1 Normal Environment

Temperature (°C):	20 – 40 (Ambient)
Pressure:	Atmospheric
Humidity (%):	40
Radiation (µSv/h):	Background

4.1.2 Process Environment

Temperature (°C):	60 (Max, Accident Conditions)
Pressure:	Atmospheric
Humidity (%):	40
Radiation (µSv/h):	≤ 25
Medium:	Air

4.1.3 Accident Conditions

The equipment has no safety class rating; however, the DVC system is the control room ventilation, therefore the filters are required to filter the iodine from the air before entry to the control room during accident conditions.

4.2 Functional Requirements

The filter is required for the purposes of trapping/filtering airborne radioiodines.

4.3 Physical Requirements

The proposed filter shall have the matching dimensions to the currently installed filters.

4.4 Verification and Test

The supplied certification shall have the following information:

a. Fabrication number
b. Cell reference
c. Cell number
d. Carbon lot number
e. Nominal flow rate
f. Maximum and minimum pressure drop over cell at rated air flow
g. Actual pressure drop over filter cell
h. Actual cell leakage value
i. Decontamination factor (acceptance criteria ≥ 4000)
j. Mass of carbon

4.5 Quality Assurance

As the quality level is Q3, the item must be procured using specification DSG-314-057.

The following certification is required:

(1) Certified Test Report
(2) Certificate of Conformance (COC)

4.6 Availability

The filters are available through Ragna Industrial.

5. Technical Evaluation / OE

5.1 Technical Evaluation

DESCRIPTION	FUNCTIONAL REQUIREMENTS (3.1.2)	CAMFIL ACTICARB 1606.36.00 (3.1.1)[1]	CAMFIL ACTICARB 2 1606.40.00 (3.1.1)[2]	COMMENTS
FUNCTION				
Valve Type	Activated Carbon Filter	Activated Carbon Filter	Activated Carbon Filter	Same
Decontamination Factor	FR > 4000	FR > 4000	Unknown	Acceptable (See Note 1)
Maximum Leak Rate (m3/h)	2.5×10^{-4}	2.5×10^{-4}	2.5×10^{-4}	Same
Operating Temperature rating (°C)	< 80	< 80	< 80	Same
Relative Humidity Rating (%)	< 40	< 40	< 40	Same
Maximum Airflow (m3/h @ 300 Pa)	1200	1200	1200	Same
Pressure Drop (Pa)	300	300	300	Same
Efficiency (% for Iodine)	97	97	Unknown	Acceptable (See Note 1)
FORM				
Media	KI and TEDA Impregnated Activated Carbon	KI and TEDA Impregnated Activated Carbon	KI and TEDA Impregnated Activated Carbon	Same
Carbon Bed Layer Thickness (mm)	50	50	50	Same
Frame Material	Painted Mild Steel	Painted Mild Steel	Painted Mild Steel	Same
Gasket Material	Neoprene Foam	Neoprene foam	Neoprene foam	Same
FIT				
Dimensions (W x H x D, mm)	610 x 610 x 292	610 x 610 x 292	610 x 610 x 292	Same
Carbon Volume	65	65	65	Same
Approximate Unit Mass (kg)	NA	82	78	Acceptable (See Note 2)
Gasket Size (mm)	Semi-Ring, Ø 15	Semi-Ring, Ø 15	Semi-Ring, Ø 15	Same

NOTE 1: The decontamination factor and efficiency of the proposed filter is not indicated on the associated datasheets; however, the OEM has confirmed that the proposed replacement filter meets or exceeds the performance of previous filter.

NOTE 2: The associated functional locations have no seismic requirements.

5.2 Operating Experience

Devonway was searched for operational experience using the following search terms; "DVC001PI", 1TEG001PI", "2TEG002PI".

The following relevant results were retrieved:

CR	Event Date	Description
GC 81421	2014/04/08	Problem title: I-131 airborne activity inside Unit 2 Control Room during 2 DVC 001 PI filter efficiency test. Initial State: No airborne Problem sequence: The airsample that was taken in Unit 2 Control Room during 2 DVC 001 PI filter efficiency test showed I-131 Airborne activity = 0.14 DAC. A follow-up sample was taken with result I-131 = 0.05 DAC. RP Manager + the OPS Shift Manager informed.
GC 38175	2008/03/04	Problem title: Low levels of I -131 detected on unit 2 control room airsample after 2 DVC 001PI efficiency test. Initial State: Low levels of I-131 on unit#2 control room airsample. Problem sequence: 2 DVC 001 PI/001 FI efficiency test was performed by I&T.The test commenced at 15:00 2008-03.03. Airsampling were performed inside the tent,outside the tent and in unit#2 control room.When the efficiency test was completed,the airsample media for particulates and iodine were changed out and the iodine samples were send to Radiochemistry for Gamma spec.analysis.The particulate samples were below the RP limits. 18:20 - The results for I-131 were received from Radiochemistry and were as follows: Inside the tent - 2.10 DAC (Contained and the tent air are on recirculation through charcoal filters of the PVU)

		Outside the tent - 0.06 DAC(Exceptable) In unit#2 control room - 0.14 DAC (Exceeding the limit of <0.1 DAC) A follow up sample for I-131 was performed immediately and forwarded to Chemistry. The Shift Chemist was requested to recount the initial sample. The Afternoon Operating shift members who were in the control room at the time were requested to go for whole body count. The follow up sample for unit#2 control was below the limit of <0.1 DAC. It was brought to my attention by I&T that there is a requirement to switch of 2 DVC 003/004 ZV prior to the efficiency test and on again as soon as possible after the the test to prevent the KIT system panels from over heating.
GC 30582	2007/01/10	Problem title: 1TEG 001PI Filter efficiency test failed. Initial State: Filter bank inoperable. Problem sequence: 9/1TEG 001PI Failed the efficiency test with a decon factor of 18.06. (The decon factor of the system must be > 65) Suggested Corrective Actions : MMV To replace Filter Bank, Notification Raised to Replace Filters, and a Retest will be done once filters are replaced.

6. Failure Modes and Effects Analysis

The new filter is a product evolution of the previous filter, with new identical construction, therefore, no new failure modes of being introduced with the use of the new proposed filter.

7. Obsolescence

7.1 End of Product

No end of manufacture has been indicated by the OEM.

7.2 End of Support

No end of support has been indicated by the OEM.

8. Conclusion

8.1 Based on the technical evaluation in Section 5.0 of this study, the proposed activated carbon filter meets the fit, form, and functional requirements with no changes to the design base of the plant. SEG therefore considers the proposed item to be a suitable replacement.

8.2 The outcome of the Safety Screening S2018/0313 is that neither a Safety Evaluation nor NNR approval is required.

9. Installation

Installation to be performed in accordance with approved Koeberg Operating Unit Maintenance procedures.

10. Training

10.1 Engineering Training

No new engineering training is required.

10.2 Ops / Maintenance Training

TCR 0437/2018 has been raised to TMG / TTG to assess the impact on OPS and Maintenance Training.

11. Documentation Updates

The following documentation and system (database) have been identified as requiring inclusion or updating:

11.1 DDR 2018/00155 has been raised to update Maintenance Manual 304 Vol. 2 (KBA 12 17 D 00 012)

11.2 Equivalency logged on DevonWay: GA 37255.

12. Commercial Updates

12.1 Purchase order text for SAP number 0049981 to be updated to reflect the following description:

MAKE:	CAMFILL
MODEL:	ACTICARB 2
TYPE:	ACTIVATED CARBON FILTER
PART NUMBER:	1606.40.00
CLASSIFICATION:	0328/87Q \Q3\NSF\NC\NEV
SPECIFICATION:	DSG-314-057
CERTIFICATION:	PERFORMANCE TEST CERTIFICATE IN ACCORDANCE WITH DSG-314-057 CERTIFICATE OF CONFORMANCE (COC)
AIRFLOW:	1200 m3/h
PRESSURE DROP:	300 Pa
EFFICIENCY:	97 % for IODINE
MEDIA:	KI AND TEDA IMPREGNATED ACTIVATED CARBON
MEDIUM:	AIR
GASKET:	SEMI-RING Ø 15mm, IN ONE SINGLE PIECE, NEOPRENE FOAM
DIMEN:	610 mm X 610 mm X 292 mm
FRAME MATERIAL:	PAINTED MILD STEEL
DRAWING:	KBA1217D00012
MM:	304 Vol. 2
ASMT:	4085
S/LIST:	KBY:P4108A43077, ITEM 16

MAKE:	CAMFILL
MODEL:	ACTICARB 2
TYPE:	ACTIVATED CARBON FILTER
FUNC. LOC.	1/2 DVC 001 PI 1 TEG 001 PI, 2 TEG 002 PI

13. Acceptance

NA

14. Revisions

Date	Rev.	Compiler	Remarks
March 2018	0	RWK	Original

15. Development Team

The following people were involved in the development of this document:

NA

16. Attachments

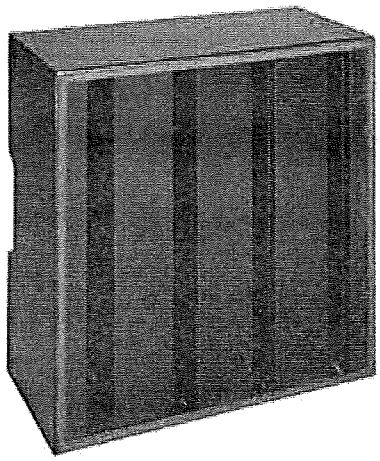
Attachment 1	CAMFIL ACTICARB 1606.36.00
Attachment 2	CAMFIL ACTICARB 1606.40.00
Attachment 3	CAMFIL ACTICARB 2 Brochure
Attachment 4	ACTICARB 1606.40.00 Certification Listing
Attachment 5	CAMFIL Declaration of Same Functionality
Attachment 6	Safety Screening Form S2018/0313
Attachment 7	Equivalency check sheet

Attachment 1

CAMFIL ACTICARB 1606.36.00

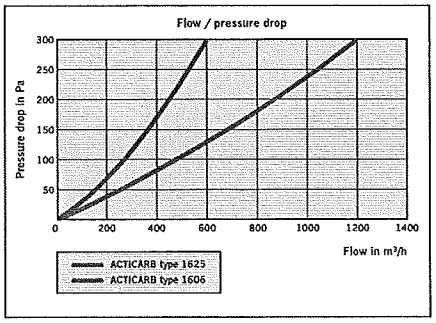
1 Page

ACTICARB 4000



ADVANTAGES

- Individual test certificate provided with each filter
- Installation performance thanks to high efficiency
- Optimal volume of activated carbon for a maximum lifetime
- Proven product, the factory controlled characteristics of which are maintained after handling and transportation



Applications: Radioiodines trapping (elementary iodine and methyl iodide), nuclear energy production industries, radio-isotopic manufacturing industries, radio-isotope users (nuclear medicine), etc.

Type: Activated carbon filter.

Media: KI and TEDA impregnated activated carbon for the trapping of iodine with carbon efficiency control at ICH3 by IRSN (Institute of Radioprotection and Nuclear Safety).

Carbon bed: layer thickness 50mm, vibrated and settled by compression mattress eliminating any risk of leak over time.

Frame: Painted mild steel or X2CrNi 18-9 stainless steel depending on model.

Gasket: Semi-ring Ø 15 mm, in one single piece, made of neoprene foam.

Decontamination factor: FR > 4000 at ICH3 for a contact time of 0.2s at 40% relative humidity.

Maximum leak rate: 2.5 x 10-4.

Control: Leak and pressure drop control at 100%.

Assembly system: Tight lock casings and platforms.

OPTIMAL OPERATING CONDITIONS

Temperature: lower than 80°C.

Relative humidity: < 40%.

Reference	Model	Dimensions (WxHxD) mm	Carbon volume litres	ICH3 filtration coeff.	Carbon impregnation	Max. Airflow / ΔP (±20%) m³/h*/ Pa	Frame	Calorific potential MJ	Approx. unit mass kg	Unit volume m³
1606.36.00	Acticarb 4000	610x610x292	65	> 4000	KI and TEDA	1200 / 300	Painted mild steel	1400	82	0.11
1606.37.00	Acticarb 4000	610x610x292	65	> 4000	KI and TEDA	1200 / 300	Stainless steel	1400	82	0.11
1625.36.00	Acticarb 4000	305x610x292	32.5	> 4000	KI and TEDA	600 / 300	Painted mild steel	700	45	0.05
1625.37.00	Acticarb 4000	305x610x292	32.5	> 4000	KI and TEDA	600 / 300	Stainless steel	700	45	0.05

** to obtain a contact time of 0.2 s.*

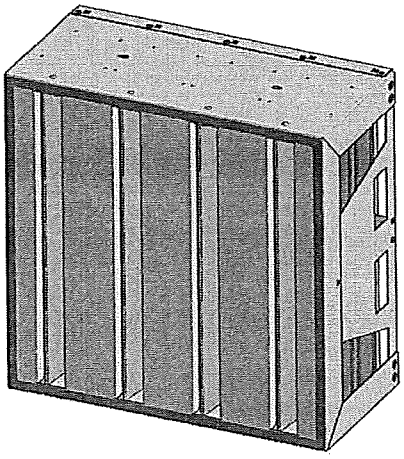
Attachment 2

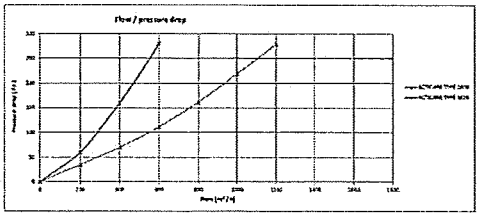
CAMFIL ACTICARB 1606.40.00

1 Page

FPA1341-A

Acticarb - IODINE TRAP FOR NUCLEAR APPLICATION





Advantages

- High efficiency filter for safety and protection uses
- Individual test of the leak rate
- Individual certificate
- Proven product, the factory controlled characteristics of which are maintained after handling and transportation
- Parameters integrated into internal software for customer simulation

Applications: Removal of radio-iodine for nuclear powerplants and radioisotopes manufacturing

Media: 50 mm (2 inch) bed depth of chromium-free impregnated activated carbon; vibrated and tamped to meet leakage requirements

Impregnant: KI (1%) and TEDA

Particle size: 8 x 16 US Mesh per ASTM E11-87 (% mass > 8 mesh (2.36mm): max 5; % mass < 16 mesh (1.18mm): max 2.5)

Frame: Painted steel or stainless steel

Gasket: ½ round 15 mm moulded neoprene foam

Working conditions:

- Relative Humidity: < 40%
- Temperature: 80°C maximum continues

Controls:

- Individual test run for leakages (< 2,5 x 10-4) and pressure drop
- Initial decontamination for ICH3 by IRSN

Article number	Frame	Size (WxHxD) mm	Adsorbent volume (liters)	Optimal airflow* m^3/h	Pressure drop Pa	Total weight kg
1606.40.00	Painted steel	610x610x292	65 liters +/- 35 kg	1200	300	78
1606.50.00	Stainless steel	610x610x292	65 liters +/- 35 kg	1200	300	78
1625.40.00	Painted steel	305x610x292	32,5 liters +/- 17 kg	600	300	43
1625.50.00	Stainless steel	305x610x292	32,5 liters +/- 17 kg	600	300	43

* to obtain a contact time of 0,2 sec.

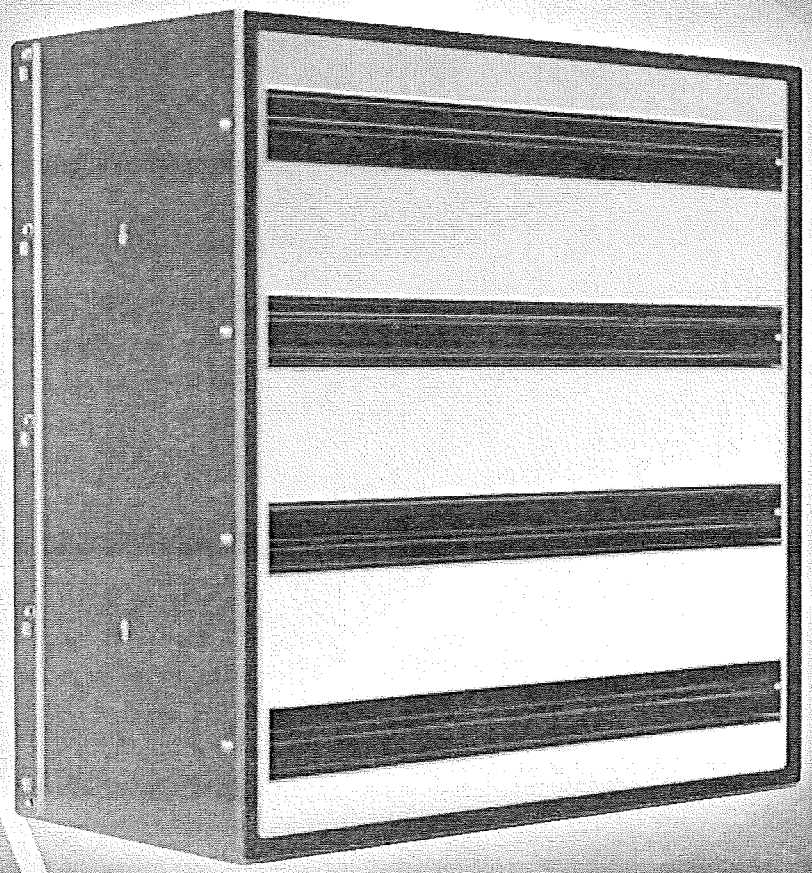
Attachment 3

CAMFIL ACTICARB 2 Brochure

3 Pages

camfil

ACTICARB 2



Clean air solutions

camfil

MOLECULAR CONTAINMENT FILTER

Molecular containment filters are filled with high quality activated carbon or Carnpure media and are used to remove molecular contaminants from supply air, recirculation air and mainly exhaust air ventilation systems. ACTICARB 2 filters eliminate customer problems with different categories of airborne molecules, including; odors, irritants, toxic and corrosives gases.

The molecular filtration media is deployed in 50 mm bed in an V pattern within a rectangular filter. This arrangement ensures even air distribution over the entire filter area and maximizes filter lifetime.

Filters mount onto a platform or into BIBO (Bag-In Bag-Out) housings allowing to change the filter without loss of containment.

For more than 50 years, Camfil has developed the Acticarb to meet the stringent requirements of the of the nuclear authorities within France. By taking advantage of this expertise, Camfil has developed a new range of ACTICARB 2 filters for the Nuclear, Research, Life Science, Healthcare and Defense sector.

MOLECULAR FILTRATION MEDIA

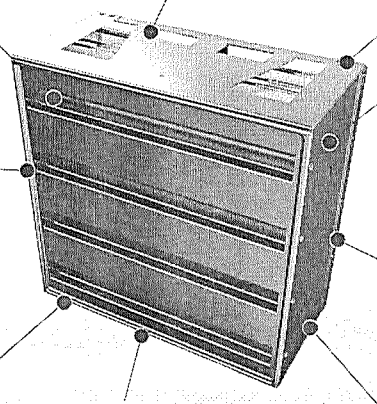
ACTICARB 2 filters may be filled with a range of "Targeted" (chemically impregnated) or "Broad Spectrum" molecular filtration medias. Broad Spectrum activated carbons provide control of VOCs/organic molecules and are especially useful in applications where the precise nature of the contaminant(s) has not been determined.

A limited number of gases are not effectively controlled using Broad Spectrum grades of carbon. In such cases, chemically impregnated grades of carbon are used to provide targeted control of specific contaminants. Examples of gases requiring special consideration include: Molecular iodine, methyl iodide, hydrogen fluoride, hydrogen sulphide, ammonia, hydrogen cyanide, mercury vapor, and formaldehyde.

The **NEW DESIGN OF THE "V" BEDS** allow to have a carbon security zone which play an important role in maintaining the performance during the Lifespan of the filter.

A **SECOND HANDLE** has been design to also facilitate the handling of the product.

THE NUMBER OF COMPONENTS has drastically decrease improving the filter easy to disassemble when possible after used. Therefore, reduce waste management treatment cost.



THE QUANTITY OF SEALANT has decrease by more than 65% so we deliver a more environmental friendly product.

The "Monobloc" design delivers a **MORE ROBUST PRODUCT**

Camfil engineers have **TESTED** on vibration table the integrity of the filter before and after **SEISMICAL CONDITIONS.**

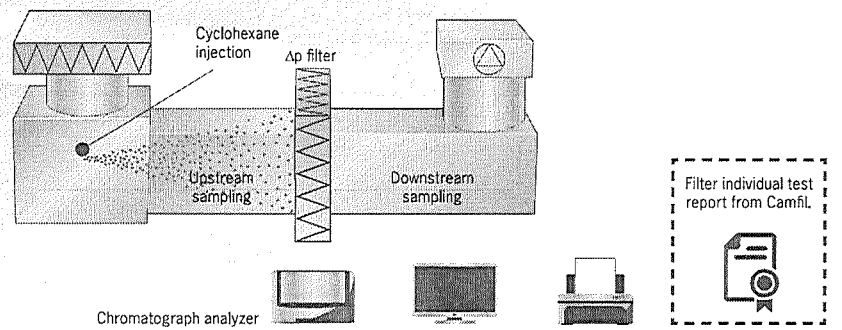
The **REDUCTION OF THE TOTAL WEIGHT** by more than 4 kg allows to facilitate the transport and the installation of the filter, saving time and money.

Camfil perform an **INDIVIDUALLY LEAK TEST** with its unique production test rig using Cyclohexane concentrations measurement upstream and downstream of the filter.

All ACTICARB 2 filters are manufactured and tested under **STRICT QUALITY CONTROLLED CONDITIONS** in accordance with our ISO 9001:2008 and ISO 14001:2015 accreditations.

ACTICARB 2: A UNIQUE TEST RIG FOR PRODUCTION

DIAGRAM OF THE LEAK DETECTION



A COMPLETE CONTAINMENT MOLECULAR FAMILY

ACTICARB 2	Example of gas to trap	Size WxlxD (mm)	Airflow (m^3xh^{-1})	Pressure drop (Pa)	Impregnation	Carbon volume (l) Weight (kg)	Control(s)
Iodine trap Nuclear	ICH_3, I_2	610x610x292	1200	300	KI and TEDA	65 l +/- 32,5 kg	Carbon, leak test, pressure drop
		610x305x292	600	300	KI and TEDA	32,5 l +/- 16 kg	
Iodine trap Medical	ICH_3, I_2	610x610x292	1200	140	KI	65 l +/- 32,5 kg	No
		610x305x292	600	140	KI	32,5 l +/- 16 kg	
Abek - NBC Defense	Removal of war toxic gases (HCN, ClCN, CCl_3NO_2,...) toxic industrial gases (Cl_2, SO_2, H_2S,...)	610x610x292	500	420	Specific	65 l +/- 52 kg	Leak test, pressure drop
		610x305x292	250	420	Specific	32,5 l +/- 26 kg	
Mercury	Mercury	610x610x292	800	100	Iodized and derivatives	65 l +/- 40 kg	Option
		610x305x292	400	100	Iodized and derivatives	32,5 l +/- 20 kg	
Formaldehyde	Removal of formaldehyde, acetaldehyde	610x610x292	1800	150	KMn04	65 l +/- 40 kg	Leak test, pressure drop
Acid gas	Removal of acid gases (HF, HCl, HNO_3, SO_2,...)	610x610x292	1200	200	KOH	65 l +/- 36 kg	Leak test, pressure drop
		610x305x292	600	200	KOH	32,5 l +/- 18 kg	
Basic gas	Removal of basic gases	610x610x292	1200	200	Acid	65 l +/- 36 kg	Leak test, pressure drop
		610x305x292	600	200	Acid	32,5 l +/- 18 kg	
VOC	Removal of VOC gases	610x610x292	1800	300	none	65 l +/- 32,5 kg	Leak test, pressure drop
		610x305x292	900	300	none	32,5 l +/- 16 kg	
VOC (Ex. At. Comp.)	Removal of VOC gases for ATEX zone	610x610x292	1800	300	none	65 l +/- 32,5 kg	Leak test, pressure drop
		610x305x292	900	300	none	32,5 l +/- 16 kg	

The activated carbon grade, impregnation, gasket depends on the gas to be trapped. Please consult our data sheets of each product family to know the performances of our product.

SUITED TO YOUR EXACT NEEDS. For any special request or whenever you need our expertise, you are always welcome to contact us – we are just a phone call or email away.

UNIQUE LIFETIME SIMULATION SOFTWARE AND LIFETIME TESTING

The lifetime of a ACTICARB 2 installation can be simulated using the unique Camfil Carbon Lifetime Determination (CLD) software for molecular filtration.

This software enables best estimates of the performance of molecular filtration products under selectable conditions that are chosen to mimic real applications.

Predicting the performance of molecular filters in the real world is a complex issue.

This software takes account of the key factors that affect the performance of molecular filters; the gas/vapor to be controlled, concentration, type of adsorbent, amount of adsorbent (contact time), and temperature.

The software has been developed using a combination of; adsorption theory, 50 years application knowledge, field measurements and results of extensive product testing in Camfil's unique molecular filtration test rig.

Attachment 4

ACTICARB 1606.40.00 Certification Listing

1 Page

CERTIFICATION : ACTICARB 16064000

We hereby declare that the products called "ACTICARB 2 16064000" will be provided with certificates detailing the following information :

- Fabrication number
- Cell reference
- Cell number
- Carbon lot number
- Nominal flow rate
- Maximum and minimum pressure drop over cell at rated airflow
- Actual pressure drop over filter cell
- Actual cell leakage value
- Decontamination factor (acceptance criteria ≥ 4000)
- Mass of carbon

Information above comes from the document referenced as DSG-314-057, Rev 4 page 4 of 4.

Done in Saint-Martin-Longueau

01/25/2018

Ludovic TAMPERE

Air Solutions Development Manager

camfil ST-MARTIN-LONGUEAU
Route d'Avrigny - BP 225
60700 SAINT MARTIN LONGUEAU
SASU au capital de 2 476 950 euros - NAF 2825 Z
RCS NANTERRE B 672 030 723 - SIRET 672 030 723 00090

Attachment 5

CAMFIL Declaration of Same Functionality

1 Page

DECLARATION OF SAME FUNCTIONALITY

Our product ranges are constantly evolving to meet the new customer 'needs and to respond to our commitment regarding our process improvement system.

We hereby declare that the products within the range called "ACTICARB_2" have at least same or superior performances to those previously existing within the range called "ACTICARB".

Old product range name	New product range name
ACTICARB	ACTICARB 2

Major upgrades:

- Robustness / Monobloc designed
- Reduction in the number of components
- Reduction in the quantity of sealant
- Weight reduction
- Creation of a carbon security zone

Done in La Garenne Colombes
2016_11_30

Raphaël MARGEZ
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Attachment 6

Safety Screening Form S2018/0313

3 Pages

Eskom	TITLE **SAFETY SCREENING FORM**	Reference No.: KFA-047 Revision: 1 | Page 1 of 3 Associated Procedure: KAA-709

No: S2018-0313 **Rev.** 0

Reason for Revision: *n/a*

CONCLUSION

Safety Evaluation required (in accordance with section 4.0 or 5.0)? YES ☐ NO ☒ Safety Evaluation Number: E -

NNR approval required (in accordance with section 6.0 or 7.0)? YES ☐ NO ☒

PREPARED BY:

NAME: *Avinash Rajkumar* **SIGNATURE:** ARajkumar **DATE:** 2018-05-31

(Preparer to be qualified in accordance with KTA-005.)

INDEPENDENTLY REVIEWED BY:

NAME: *Sheldon Swartz* **SIGNATURE:** [signature] **DATE:** 2018-05-31

(Reviewer to be qualified as a Safety Evaluator.)

APPROVED BY:

NAME: *Aminah Stephanus* **SIGNATURE:** A Stephanus. **DATE:** 2018-05-31

(Approver must not be the reviewer and must be qualified as a Safey Screener or Evaluator.)

1.0 DESCRIPTION

1.1 This screening is for:

☐ Procedure; ☐ Temporary Alteration; ☐ Modification; ☐ Modification (30%Phase); ☐ Test; ☒ Other

Revision/Activity/Condition No.: *M006-18E*

Title:

Activated Carbon Filter

Brief Description of Activity or Plant Condition:

This equivalency study technically evaluate the product evolution of the activated carbon filter used in functional location 1/2 DVC 001 PI, 1 TEG 001 PI & 2 TEG 002 PI.

2.0 EDITORIAL CHANGES YES ☐ NO ☒ (KAA-709, Appendix 2)

RE-REVIEWS YES ☐ NO ☒ (For re-reviews, sections 3-5 may be skipped.)

2.1 If editorial change is "YES"(in accordance to Appendix 2), provide a short explanation why sections 3-5 may be skipped.

n/a

2.2 If a screening/evaluation has been compiled previously for this change, provide a short explanation why the previous screening remains valid for the additional process, both in terms of impact and applicability. (Reference original screening/evaluation.)

n/a

3.0 KLA-001 CLASSIFICATION

3.1 What parameters or SSCs are affected by this activity/condition? *1/2 DVC 001 PI, 1 TEG 001 PI & 2 TEG 002 PI*

3.2 KLA-001 classification of SSCs identified in 3.1 above: *DVC is AR & TEG is SR*

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4.0 IMPACT ON DESIGN / LICENSING BASIS

4.1	Is the activity/condition a change to or does it affect any of the following:		
4.1.1	Operating Technical Specifications;	YES ☐	NO ☒
4.1.2	Radiation Protection Licencing Requirements;	YES ☐	NO ☒
4.1.3	Emergency Operating Procedures/SAMGs;	YES ☐	NO ☒
4.1.4	Emergency Plan.	YES ☐	NO ☒
4.2	Does the proposed activity/condition involve a change to an SSC that **affects** the **design** as described in the SAR and DSE?	YES ☐	NO ☒
4.3	Does this proposed activity involve a change to a procedure that **affects** how design base (SAR and DSE) described SSC **design functions are performed or controlled**?	YES ☐	NO ☒
4.4	Does this proposed activity involve **revising or replacing** an SAR described **evaluation methodology** that is used in establishing the design bases or used in the safety analysis?	YES ☐	NO ☒
4.5	Does this proposed activity involve a **test or experiment not described in the SAR** where an SSC is utilised or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the SAR?	YES ☐	NO ☒

Conclusion and supporting arguments:

There is no differences between the old and new filters with regard to fit, form and function. The new filters are marginally lighter but that is of no significance.

The change of this filter does not have an impact on the design / licence basis. This change does not impede the plant's capability to come to a safe shutdown state, nor does it adversely affect any equipment required for severe accident mitigation.

5.0 GENERAL

Will/could the activity/condition:

5.1	affect the ability of the operator to assess or control the nuclear safety status of the plant?	YES ☐	NO ☒
5.2	affect the nuclear safety reponse of the plant to normal evolutions, anticipated operational occurrences, or accidents?	YES ☐	NO ☒
5.3	affect the qualification or operational characteristics of installed important to safety components classified?	YES ☐	NO ☒
5.4	increase the potential for the release of radioactive material to the environment, or have an impact on the activity migration model?	YES ☐	NO ☒
5.5	increase the potential for an initiating event (list in Appendix 5)?	YES ☐	NO ☒
5.6	introduce a new common mode failure?	YES ☐	NO ☒

Comments: *None.*

If ANY answer in Section 4.0 or 5.0 is "YES", a Safety Evaluation is required.

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6.0 SAR IMPACT

SAR Sections Reviewed:
II-7.4.2.2 Control Room Air Conditioning System (DVC) &
II-5.1.5 Gaseous Waste Treatment System (TEG)
SAR Update Request raised? YES ☐ NO ☒ No: *n/a*
Note: NNR approval is required for SAR updates

7.0 NNR APPROVAL

Is this activity/condition:

7.1	a change to a NIL-01 Licence Condition, LD, RD, or subsequent LCRs?	YES ☐	NO ☒
7.2	a change to a document which needs NNR approval as listed in Appendix 6?	YES ☐	NO ☒
7.3	a modification that requires approval according to the requirements of LD-1012?	YES ☐	NO ☒

Use the Licence Impact Form to assist in answering the above. Copies of NIL-1, LDs, RDs and LCRs can be found on: g\\userg\nuclear engineering\design engineering\safeval\forms

Attachment 7

Equivalency Check Sheet

2 Pages

Eskom	Equivalency Check Sheet (Activated Carbon Filter)	Template Identifier	331- 412	Rev	1
		Equivalency Number	M008/18E	Rev	0
		Authorisation Date	29/03/2018		

DESCRIPTION	Applicable	Not Applicable	COMMENTS (if not applicable)
SYSTEM DATA			
Atmospheric pressure	☒	☐	
Atmospheric temperature	☒	☐	
Medium temperature	☒	☐	
Medium pressure	☒	☐	
Process medium	☒	☐	*Note: if boric acid, use EPRI guide 1000975 page 9-6)*
Process application (Function of component in support of plant system)	☒	☐	
Process environment (moisture, humidity etc.)	☒	☐	
Seismic	☐	☒	No seismic requirement
Environmental Qualification (Check 331-219: Environmental Qualification Maintenance Manual)	☒	☐	
Radiation	☒	☐	
Hazardous location	☒	☐	
Software	☐	☒	Passive component
Firmware	☐	☒	Passive component
COMPONENT DATA			
Temperature limits	☒	☐	
Weight	☒	☐	
Filtration Medium	☒	☐	
Filter Construction	☒	☐	
Filter Efficiency	☒	☐	
COMPONENT MATERIAL			
Housing and body	☒	☐	
Elastomers	☒	☐	
INSTALLATION DATA			
Overall dimension	☒	☐	
Mounting position	☒	☐	
Method of mounting	☒	☐	
ADDITIONAL DETAILS			
Check SRSM for Cvf criteria requirements (KBA-0022-SRSM-000-00)	☐	☐	
EMI	☐	☐	

COMPILER		REVIEWER	
Name	R. Kannemeyer	Name	pp. A STEPHANUS
Signature		Signature	
Date	2018/03/27	Date	2018-04-26.