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Kozloduy NPP Plc.

Attention to:
Executive Director
Mr. Nasko MIHOV

3321 Kozloduy Bulgaria

Framatome GmbH

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Your letter of Our reference Date	n.a. FRAM-KNPP-FIL-R1 29/04/2022

Subject:

Доставка на аерозолни филтри тип ФРА-95-10М и йодни филтри тип АВФ 1500
Market investigation on aerosol and iodine filters

Dear Mr. Mihov,

During a workshop on site at Kozloduy NPP, July 27th 2021, several topics have been discussed by our teams of KNPP and Framatome. Recently Framatome has recognized the invitation for market consultation No. 48160 requesting information on (1) aerosol filter type ФРА-95-10М and (2) iodine filter type АВФ 1500.

Please find below some market information which is available based on the technical information provided in the market consultation. According to the feedback of various suppliers more detailed information are required to assess the feasibility of the customized design for the aerosol filters and to clarify acceptability of minor deviations of the parameters specified for the iodine filters.

Framatome is available to provide services to Kozloduy NPP to further clarify the exact needs with a potential filter supplier to achieve an adequate solution. Framatome can provide added value with regard to design, qualification, documentation, etc. or simply provide engineering and procurement services.

We regret for not providing price information at this time. To do so, further discussions and a clarification and agreement of detailed design documentation are required.

We hope you are interested to develop this proposal in more details and consider Framatome to support on this. We are available for a meeting to discuss any details at your convenience.

Yours truly,

Мария
Sales Developer

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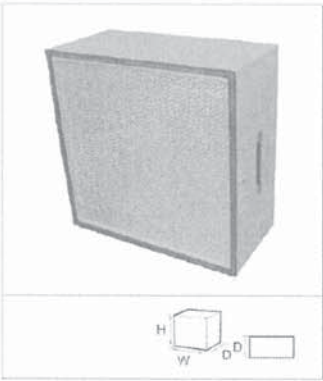

(1) aerosol filter type Φ PA-95-10M

To answer to your request, Framatome has contacted the company Trox for supply of the filter elements. Trox informed that the specific filters are discontinued products (a special machine for spacer manufacturing was moved out of service 6 to 8 years ago). Trox pointed towards Afpro Filters as potential supplier for the specific design. However, the discussions with Afpro Filters did not succeed. Afpro is generally not interested in supplying to nuclear industry and has submitted a formal no-bid information to Framatome for the specific design.

Hence, Framatome has contacted other filter suppliers with the design information provided by Kozloduy NPP.

Standard aerosol filters matching in general the functional requirements are available. The specified dimensions are not in agreement with standard products. Customization is generally possible. Our supplier already indicated that manufacturing of the load bearing eyes is generally possible. However, the provided information in the market investigation are insufficient for a custom design. Especially the details of the specified supporting metal structure are not clear. The general purpose of stiffening the overall filter structure with such a frame is as part of the customization is considered feasible as well.

As reference a standard aerosol filter (single, without stiffening structure) is shown below. Framatome would be pleased to work out a detailed customization to the exact needs of Kozloduy NPP.

Advantages

- High quality glass fibre media
- High efficiency
- High mechanical strength
- Long operating lifetime
- Rigid design
- High dust holding capacity

Application: HEPA Filter for nuclear power plant
Type: HEPA Filter
Frame: Plywood (twelvefold glued)
Gasket: I = Flat gasket; D = DIN gasket
Media: Glass fibre
Separators: Aluminum; tapered
Sealant: Polyurethane (2-K-sealant)
Efficiency acc. EN 1822:2009: H13
MPPS efficiency acc. EN 1822:2009: $\geq 99,95\%$ at MPPS
Recommended final pressure drop: 2x initial pressure drop
Maximum pressure drop: 2500 Pa
Temperature / Humidity: 110°C / 100% RH
Remarks: All filter tested acc. EN 1822:2009.

Upper mechanical limit of standard filter -> deviation to the requested 3000 Pa

Standard filter dimension, customized dimensions are possible but have to be agreed

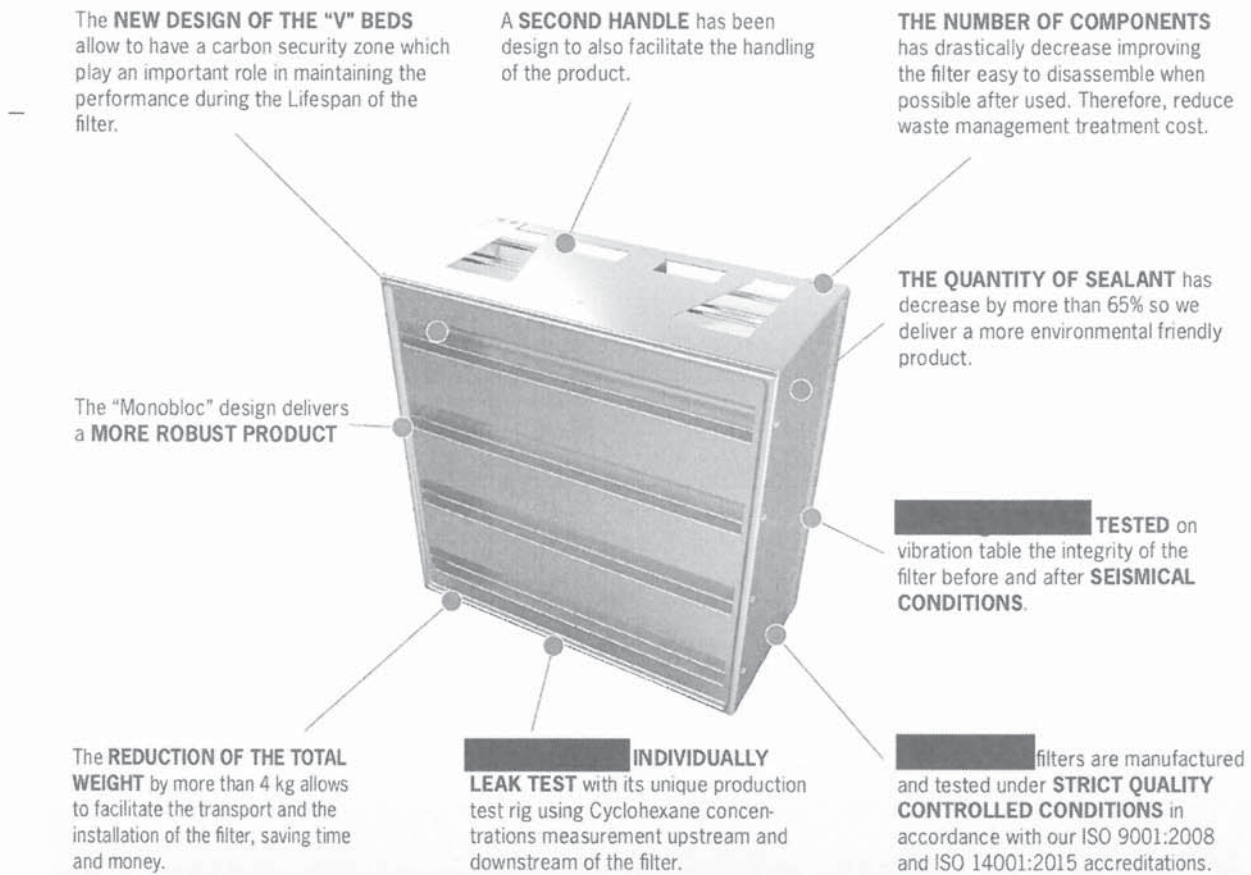
Type	Efficiency	Dimensions WxHxD (mm)	Media surface m ²	Airflow / pressure drop (m ³ /h / Pa)	Freight volume (m ³)	Freight weight (kg)	Art. N°
	H13	305x610x292	15,00	1260 / 250	0,083	-	
	H13	610x610x292	32,70	2780 / 250	0,128	-	
	H13	610x610x292	32,70	2780 / 250	0,128	-	
	H13	762x610x292	41,30	3500 / 250	0,160	-	
	H13	762x610x292	41,30	3500 / 250	0,160	-	

Pressure drop: $\leq 11\%$
 Type - I = gasket placed upstream; Type / G = handle
 D = gasket placed upstream

(2) iodine filter type ABΦ 1500

The information provided information in the market investigation generally match a standard iodine filter equipment available on the market.

As reference a standard iodine filter is shown below. Framatome would be pleased to work out a detailed supply of such filters for Kozloduy NPP.



	Example of gas to trap	Size WxHxD (mm)	Airflow (m ³ ·h ⁻¹)	Pressure drop (Pa)	Impregnation	Carbon volume (l) Weight (kg)	Control(s)
Iodine trap Nuclear	ICH ₂ 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	