



**Statement of Requirement
for
1500 MHz Radio Frequency Filter Kit**

February 10, 2023

Version 1.0

1. Scope

This Statement of Requirement (SOR) details the requirements for 1500 MHz Radio Frequency Filter Kit.

1.1 BACKGROUND

Innovation, Science and Economic Development (ISED) Canada, Spectrum and Telecommunications Sector (STS) is currently modernizing its aging radio frequency test and measurement equipment portfolio under the auspices of the Pulsar program. This equipment is used to monitor, localize and measure technical parameters of radio emissions for radio interference, compliance and enforcement work.

STS Officers are often required to perform radio frequency measurements in the commercial broadcast, aeronautical and land mobile radio VHF, UHF and microwave bands. These measurements and tests often occur in hostile (i.e. high signal and noise levels) RF environments necessitating the use of RF filters to protect equipment from damaging overload and allow accurate measurements to be made. Radio frequency filters currently in use have reached end of life and cannot be repaired when worn out or broken. This necessitates the need for replacement to ensure that this capability is maintained going forward.

1.2 Instructions

The following instructions apply to this specification:

- a) Requirements, which are identified by the word “**must**”, are mandatory. Deviations will not be permitted.
- b) Requirements identified by “should” are considered non-mandatory
- c) Where a technical specification or requirement is identified in the mandatory or rated technical specifications “Proof of Compliance” must be provided with the RFP response-

1.3 Definitions

The following definitions apply to the interpretation of this Statement of Requirement:

“Technical Authority” - The government official responsible for technical content of this requirement.

“Filter Kit” – The entire filter kit including all parts such as the filtering device and a compact/rugged carrying case in a complete manufactured state in accordance with the Statement of Requirement.

“Equivalent” - A standard, means, or component type, which has been deemed to be acceptable by the Technical Authority as meeting the specified requirements for form, fit, function and performance.

“Proof of Compliance” is defined as an unaltered document, such as a product marketing brochure, and/or operating manual and/or service manual, and/or product data sheet and/or a representative sample of a manufacturing final QA test report. The document must provide detailed information on each performance requirement and/or specification. Where a document submitted as Proof of Compliance does not cover all the performance requirements and/or specifications, an attestation (as a separate document) signed by an authorized representative of the Original Equipment Manufacturer (OEM) detailing how the performance requirements and/or specifications are met must be provided.

1.4 Technical Specifications

The Contractor must provide the requested filter kits in accordance with the technical specifications detailed in *Appendix 1: Mandatory Requirements for 1500 MHz Radio Frequency Filter Kit* ., and any optional specifications offered by the Contractor in accordance with *Appendix 2: Rated Requirements for 1500 MHz Radio Frequency Filter*

1.5 Standard Design

- a) The components in the kit must be the manufacturer’s latest in production models.

1.6 Identification

The following information must be permanently marked in a visible and protected location on the kit:

- a) Manufacturer's name, model and serial number.

1.7 Accessibility requirements

Any available documentation should be delivered in an accessible format, in compliance with the Harmonised European Standard, EN 301 549 (2018)

(https://www.etsi.org/deliver/etsi_en/301500_301599/301549/02.01.02_60/en_301549v020102p.pdf) for accessible Information and Communication Technology (ICT), clause 10 for non-web documents.

Any other instructions that are provided with the kits should conform to those standards for web-based documents, electronic documents, and hard copies.

The provision of facilities, tools and services, and all associated costs, to make the components and deliverables of this project accessible must be at the Contractor's expense.

For practical guidance on creating accessible documents, refer to these [Accessible Document Guides](https://a11y.canada.ca/en/) (https://a11y.canada.ca/en/).

1.8 Equipment Lifecycle

Lifecycle of this equipment will be a ten (10) year period from date of delivery and acceptance of goods received as ordered and received undamaged.

1.9 Maintenance Support

1.9.1 The Contractor **must** ensure capability to provide parts and repair for a period of ten (10) years from date of delivery and acceptance of the equipment.

1.10 Warranty

- a) Each unit purchased must include one (1) year standard warranty.
- b) The Contractor must provide a list of all Canadian designated warranty service providers that will honour the warranty for the equipment procured under this contract, including the contact person and phone number at each warranty provider. Where no Canadian designated warranty service providers are available, the Contractor must provide a list of intermediate depots located in Canada that will facilitate the transit of the warranty equipment to outside Canada for servicing. The Contractor must include the contact person and phone number at each depot. The Contractor will be responsible for the cost of handling and shipping the defective part/component to the factory for repair. The Contractor will be responsible for handling, packaging and shipping the replacement equipment to the designated ISED destination.
- c) The warranty must include coverage for material and labor for covered repairs.
- d) The Contractor must provide contact information, name and phone number, for warranty support.

1.11 List of Deliverables

1.11.1 Radio Frequency Filter Kits

Description	Quantity
Radio Frequency Filter Kits, as specified in the Statement of Requirements	71 units



Appendix 1: Mandatory Requirements for 1500 MHz Radio Frequency Filter Kit

(Reference: Appendix 3 – Definitions and Glossary Syllabus)

Category	Required Specifications
Storage Case	
Storage Case	The filter must be packaged in a single, compact, hard carrying case that provides soft interior padding for the safe storage of all components, and accessories. The case must meet IEC Ingress Protection IP 64 rating or better IP rating.
Coverage Band 1500 MHz to 3000 MHz	
Filter Type	The filter must be a passive, tunable, bandpass filter.
Physical Form Factor	The filter offered must be in the form factor of an enclosed “brick” shaped unit.
Frequency Coverage	The filter must cover its entire required center frequency operating range without any gaps.
Lowest tunable center frequency	The minimum tuned center frequency of the filter must be less than or equal to 1500 MHz.
Highest tunable center frequency	The maximum tuned center frequency of the filter must be greater than or equal to 3000 MHz.
3 dB Bandwidth	The filter must provide a tuned frequency dependent nominal 3 dB bandwidth not exceeding 1% of the tuned center frequency across the entire required frequency range of the unit (i.e. 3 dB BW of 15.0 MHz @ $F_c = 1500$ MHz increasing to 3 dB BW of 30 MHz @ $F_c = 3000$ MHz).
Passband Ripple	The passband ripple must not exceed +/- 1 dB across the entire required frequency range of the unit.
External Tuning Control	The filter must be user tunable by the means of a single tuning knob/dial to adjust all internal ganged filter poles simultaneously.
Tuning Scale	The filter must provide an integrated, mechanical, readout to indicate the approximate center frequency the filter is tuned to.
Tuning Scale Accuracy	The integrated tuning readout must offer a minimum accuracy of 2 % of the indicated frequency.
Filter Impedance	Nominal filter impedance must be 50 ohms.
Filter Insertion Loss	The filter insertion loss must not exceed 3.0 dB across the entire required frequency range.
Filter VSWR	The maximum allowable VSWR across the entire required frequency range must not exceed 1.5:1.
Power Handling	The filter must be capable of handling a CW input power of 10 watts.
RF Connector Type	The input and output RF connectors must be female N type.
Filter Dimensions	L x W x H must be less than or equal to 20 x 10 x 10 centimeters
Operating Temperature	The filter must be able to function within required specifications at room temperature.
Corrosion Protection	The exterior surfaces of the filter must be protected from corrosion.



Appendix 2: Rated Requirements for 1500 MHz Radio Frequency Filter Kit

(Reference: Appendix 3 – Definitions and Glossary Syllabus)

Category	Required Specifications
Extended Operating Temperature Range	<p>The filter should be able to provide passband filter functionality (ie. capable of being physically tuned and presenting a passband filter transfer function) over extended ambient operating temperature ranges of:</p> <ol style="list-style-type: none"> 1) 0 degrees C to + 25 degrees C 2) -10 degrees C to +30 degrees C 3) -20 degrees C to +35 degrees C 4) -25 degrees C to +40 degrees C 5) -30 degrees C to +50 degrees C

Appendix 3 –Definitions and Glossary Syllabus

Definitions	
Filter Kit	Filter Kit containing the filter, any documentation provided and associated carrying case in a complete manufactured state in accordance with the Statement of Requirement.
Glossary	
BW	Bandwidth
C	Temperature in degrees Celsius
COTS	“commercial off the shelf” product
CW	Continuous Wave
dB	Decibels – logarithmic ratio of powers
Fc	Tuned center frequency
IEC	International Electrotechnical Commission
IP	Ingress Protection rating factor
L x W x H	Length x Width x Height
MHz	Radio frequency in millions of hertz
N	Type N RF connector
OEM	Original Equipment Manufacturer
QA	Quality Acceptance
RF	Radio Frequency
RFP	Request for Proposal
Room temperature	Any temperature within the range of +15 degrees to +25 degrees C
UHF	Ultra-High Frequency
VHF	Very High Frequency
VSWR	Voltage Standing Wave Ratio