Technical Specification for the manufacture and supply of the ISIS MERLIN COLLIMATOR

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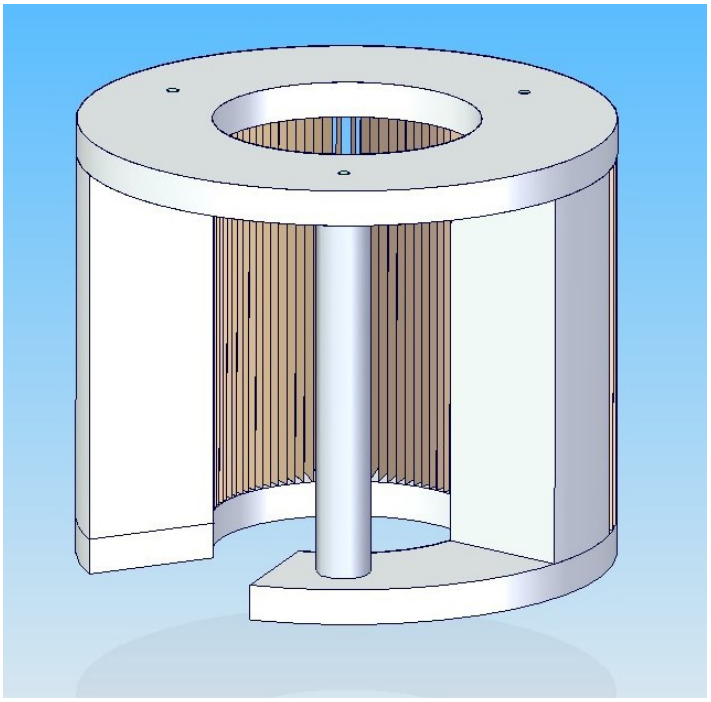
Abstract

This Technical Specification describes the technical and tendering requirements for the provision of a Collimator to be used on the MERLIN instrument at the Rutherford Appleton Laboratory ISIS - Target Station 1

The item is to be manufactured and delivered by the end of March 2017



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1. INTRODUCTION

1.1 Introduction to the MERLIN Instrument and the tender

The MERLIN Instrument is a high intensity, medium energy resolution spectrometer. It has been in operation since 2008. It uses a super-mirror guide to enhance the flux as well as 3m long position-sensitive detectors working in vacuum.

This specification only covers the technical and tendering requirements of the collimator. For the main overview of the collimator, please refer to drawing: SI-2553-914-B. In all cases this specification drawing takes precedence. For additional details refer to the UK SBS Procurement tendering information provided. All contact should be made through the Emptoris e-Sourcing portal via UK SBS.

This drawing provides overall dimensions and details of the collimator's vanes. Final design and detailed manufacturing drawings are to be supplied by the collimator supplier and agreed by STFC before manufacture.

2. SCOPE OF THE TENDER

2.1 The supply shall include the following:

- Pre-manufacture drawings of the proposed collimator;
- Technical details: parameters; materials; etc.
- Details of any other supplied items, finishes, etc;
- Cost breakdown;
- Payment terms;
- Delivery and manufacturing plan;
- Any relevant QA documentation or examples of similar work.

All the contractual and technical documentation shall be provided in English.

3. GENERAL CONDITIONS FOR TENDERING AND CONTRACTING

3.1 Pre-tender Discussions

The Bidder is encouraged to contact UK SBS or any persons designated in the appendix should they require further information, before making an offer. UK SBS wishes to ensure that no doubt exists as to the interpretation of this Technical Specification.

All contact should be made through the Emptoris e-Sourcing portal via UK SBS.

3.2 Deviations from this Technical Specification

All deviations from this Technical Specification, the Tender, or any other subsequent contractual agreement, proposed by the Bidder, shall be submitted to STFC in writing for the latter's consideration.

STFC reserves the right to modify this Technical Specification during execution of the Contract. The consequences of such modifications shall be mutually agreed between STFC and the

Contractor. The Contractor shall not unreasonably withhold their agreement to such modifications which shall take the form of formal amendments to the contract, to be administered by STFC.

4. TECHNICAL REQUIREMENTS

4.1 Location

This collimator will be located inside the MERLIN vacuum tank, centred on the sample position. All trapped volumes are to be suitably vented. Blind holes should be vented or use vented screws. The collimator will be removed through a hole in the top of the vacuum tank. Suitable lifting points are required – see section on lifting below.

4.2 Coverage

The Collimator's array covers 180°, offset at 43° to the incoming beam. A gap is provided at the outlet beam side. The inside diameter is 300mm, the outside 600mm. The minimum active blade height is 420mm. The overall height needs to be specified by the supplier, after allowing for the blade height and the thickness required for the top and bottom rings.

In all cases refer to the over-riding specification drawing: SI-2553-914-B.

4.3 Blades

Each blade is to be made from Mylar. The maximum blade thickness including the coating is to be less than 0.1mm. The blade spacing is 6.0°. Each blade must be tensioned so as to hold each blade flat and straight with no wrinkles, when supported on the required 3 base kinematic fixings. The supplier must specify the blade size and thickness achievable.

4.4 Support pillars

Support pillars are required in 3 places to separate and support the top and bottom rings. The supplier is to specify the details of these.

4.5 Coatings

The blades are to be coated with an emulsion of Gadolinium Oxide (Gd_2O_3). The coating is to be applied evenly, but thick enough, so that a minimum density of 1.5 mg/cm^2 is maintained. The overall thickness shall not exceed 0.1mm.

Other surfaces on the Collimator should also be coated with Gadolinium to prevent further scatter. The upper face of the top ring and the lower face of the bottom ring require coating. Care should be taken here to avoid ingress of Gadolinium into any apertures or screw holes. The inner radius surface of both rings also requires coating. A Gadolinium coating density greater than 75 mg/cm^2 is recommended for these surface coatings.

4.6 Fixings

The base (bottom ring) of the Collimator requires fixing details as shown on drawing SI-2553-914-B. These points allow kinematic feet to be attached and the collimator to sit on the oscillating mechanism inside the MERLIN vacuum tank – or on any flat surface as required. Supporting the collimator on these 3 points must not induce a loss of tension in the blades and thus compromise the blade flatness.

4.7 Environment

The Collimator will be housed in a vacuum environment and stored in air at room temperature when not installed. The nominal temperature range expected will be 15° to 35° C.

4.8 Materials
Due to the proximity of a cryo-magnet, all collimator construction materials and fixings must be non-magnetic.

4.9 Additional items
A detachable lifting frame is not required as this will be supplied by STFC.
External covers that provide protection to the foils during transport must be provided.

4.10 Schedule
The supplier should provide a schedule showing the design, manufacture and delivery. It should show manufacturing and inspection milestones plus expected stage payment dates.

4.11 Delivery date
The collimator is to be delivered to the address shown below no later than 24th March 2017.

5. ADDITIONAL ITEMS

It would be an advantage for the supplier to provide examples of other similar collimators supplied.

6. WARRANTY

The supplier should provide a statement on the warranty that they would provide.

7. DELIVERY

The collimator is to be delivered to STFC.

The address is:

STFC Rutherford Appleton Laboratory
ISIS Department
Harwell Campus
DIDCOT
Oxfordshire
OX11 0QX
United Kingdom