DISCLAIMER

SRC Technical Notes are informal memos intended for internal communication and documentation of work in progress. These notes are not necessarily definitive and have not undergone a pre-publication review. If you rely on this note for purposes other than its intended use, you assume all risk associated with such use.
SECTION 1: GENERAL CONSIDERATIONS

1.a Function. This grating will be used as a low energy grating (LEG) in the High Energy Resolution Monochromator operated at the Synchrotron Radiation Center (SRC).

1.b Scope of Work. The successful bidder shall provide all of the materials, fixtures, and labor required to rule a grating with the variable groove density profile specified in this document onto the blank supplied by SRC as shown on SRC Drawing No. 4577D002C.

SECTION 2: GRATING BLANK

2.a The supplied blank size is 220 x 35 x 30 mm (L x W x H) with a spherical radius of 73000 mm. It has clamping ledges at both ends for holding the grating per SRC Drawing No. 4577D002C.

2.b The ruled area of the grating must be 200 mm x 25 mm centered on the blank.

SECTION 3: RULING DENSITY

3.a The rulings will vary across the surface in a uniform manner with a nominal density of 175 l/mm.

3.b The ruling density will have the functional form:

\[ \rho = \rho_0 + A_1 \cdot (l - \text{lo}) + A_2 \cdot (l - \text{lo})^2 \]

where

3.c \[ \rho_0 = 175 \text{ l/mm } \pm 0.175 \text{ l/mm} \]

3.d \[ A_1 = -0.02782 \pm 0.000028 \text{ l/mm}^2 \]

3.e \[ A_2 = +0.187 \times 10^4 \pm 0.0075 \times 10^4 \text{ l/mm}^3 \]
3.f \( l_0 = 132 \text{ mm} \pm 0.5 \text{ mm} \)

3.g \( l = \) the position along the grating length as specified below

3.h The position where \( l = 0 \) will be the datum end labeled A on the SRC drawing 4577D0002C.

3.i The tolerances given for the coefficients represent allowable variations of the equation that is used to describe the rulings.

3.j The equation implies a specific placement position for each ruling.

3.k The tolerances do not imply that the accuracy of each ruling with respect to the next is relaxed.

3.l The highly accurate placement of each ruling will be necessary to produce focusing of spectrally pure light in the 9.0 to 19.8 nm range in first order, and the 4.5 to 9.9 nm range in second order.

SECTION 4: BLAZE

4.a The ruling will be blazed for \( 0.98 \pm 0.2 \) degrees which corresponds to 12.0 nm (103.3 eV) in a 173 degree constant deviation grazing incidence monochromator.

4.b A detail view is shown in SRC drawing 4577D002C.

4.c The outside orders of diffracted light will be used.

4.d The direction of the blaze of the new rulings will agree with the blaze arrow on the supplied blank.

SECTION 5: FABRICATION

5.a This grating will be used in an Ultrahigh Vacuum Environment and must comply with the applicable sections of SRC Technical Note 99.

5.b The rulings are to be produced by a conventional ruling engine.

5.c If an organic resist material is to be used it must be removed by methods specified in SRC Technical Note 99.

5.d Any testing by the vendor which requires a strippable surface coating must use silver.
5.e No aluminum may be used on the grating surface and all precoating materials must be removed by methods specified in SRC Technical Note 99.

SECTION 6: COATING

6.a The ruled grating surface will be coated with a gold film 50 nm thick for use in the 4.5 - 19.8 nm range.

SECTION 7: SHIPPING

7.a All handling of the grating after final cleaning and coating must be compatible with standard clean room practices.

7.b Talcum powder free clean room gloves must be used when handling the grating.

7.c Oil, finger prints, dust and other contaminants must be kept off of the grating.

7.d Hermetically sealed packaging which will protect the grating from dust and contamination during shipping must be used.

7.e The grating must be held securely in its shipping container such that contaminating particles are not produced by chafing in shipment between the grating and its container.

SECTION 8: SUBMITTALS

8.a Bidders must submit with their quotation the following information:

8.a.1 Examples of work previously done which demonstrates the bidders capability to perform the operations required to produce the grating specified in this document and shown on SRC drawing No. 4577D002C.

8.a.2 Any exceptions or variations to statements in this document or to dimensions and tolerances shown on SRC drawing No. 4-577D002C.

SECTION 9: SPECIAL CONDITIONS

9.a SRC reserves the right to visit the bidders facility before awarding a contract.

9.b SRC reserves the right to inspect the grating during fabrication.
9.c Delivery is required on or before four (4) months after receipt of order (ARO) and blank. Timeliness of delivery may be used in the bid evaluation. Bidders must indicate a firm delivery date on the Request for Bid Form.

9.d A liquidated damages clause is included to insure timeliness of delivery. Liquidated damages will be based on the number of full months the actual delivery exceeds the delivery date quoted by the bidder on the Request for Bid Form. Liquidated damages equal to 5% of the bid price per month will be assessed for the first three months. Starting the fourth month and beyond, the damages will become 10% of the bid price per month. Damages will be subtracted from the invoice at time of payment.

9.e SRC drawing No. 4577D002C and SRC Technical Note 99 are considered to be part of this specification.

"WARNING"

The material in this document and SRC Drawing No. 4577D002C is covered by US Patent No. 4,991,934 issued 2/12/91. Any use of this material must have the prior approval of the patent holder.
BIDDERS LIST

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