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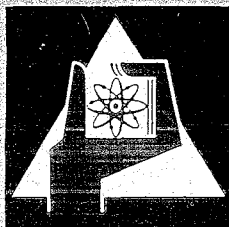
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EANDC(E)-125"U"

Institut für Neutronenphysik und Reaktortechnik

Evaluated Microscopic Neutron Cross Sections and
26 Group Constants for Cd

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^xWork performed within the association in the field of fast reactors between the European Atomic Energy Community and Gesellschaft für Kernforschung mbH., Karlsruhe.



A b s t r a c t

This report briefly documents microscopic cross section data for Cd in the energy range 0.001 eV to 15 MeV recently incorporated in the Karlsruhe KEDAK file. The fast neutron cross sections were almost exclusively taken over from an evaluation by Drake from GGA with slight changes only in KeV capture cross sections. In the thermal and resolved resonance energy ranges the neutron cross sections were recalculated from resonance parameters reevaluated with due account of more recent experimental information. The evaluated microscopic cross sections and resonance parameters have been transferred to and are available from the ENEA/CCDN. From the microscopic cross sections (unshielded) group cross sections in the 26 ABN group structure were calculated using both the neutron spectrum of a fast Na cooled prototype reactor and the neutron spectrum of the ABN group cross section set as weighting spectra.

Z u s a m m e n f a s s u n g

Dieser Bericht stellt eine kurze Dokumentation dar für Wirkungsquerschnittsdaten für Cd im Energiebereich 0.001 eV - 15 MeV, die vor kurzem auf das Karlsruher Kerndatenband KEDAK aufgenommen wurden. Die schnellen Neutronenwirkungsquerschnitte wurden nahezu ausnahmslos von einer Auswertung von Drake (GGA) übernommen mit kleinen Änderungen nur in den keV Einfangquerschnitten. Für thermische Energien und im Gebiet aufgelöster Resonanzen wurden die Resonanzwirkungsquerschnitte neu berechnet. Hierzu wurden neu ausgewertete Resonanzparameter mit Berücksichtigung neuerer experimenteller Informationen verwandt. Die ausgewerteten mikroskopischen Wirkungsquerschnitte und Resonanzparameter wurden an das ENEA/CCDN weitergeleitet und sind von dort erhältlich. Von den mikroskopischen Wirkungsquerschnitten wurden (unabgeschirmte) Gruppenquerschnitte in 26 ABN-Gruppenstruktur berechnet. Hierbei wurden als Wichtungsspektren das Neutronenspektrum eines schnellen Na-gekühlten Prototypreaktors und das Neutronenspektrum des ABN-Gruppenquerschnittsatzes verwandt.



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1. Introduction

This report briefly documents microscopic cross section data for Cd in the energy range 0.001 eV to 15 MeV recently incorporated in the Karlsruhe KEDAK file of evaluated data. The bulk of the fast neutron cross section data above 1 keV has been taken over almost without any change from a recent evaluation by Drake [1]. In the range of resolved resonances below 1 keV more recent resonance parameter information has been considered and incorporated into new sets of resonance parameters for all stable Cd isotopes. Also new cross sections in the thermal and resonance energy ranges have been calculated from these resonance parameters. The evaluated microscopic cross sections and resonance parameters have been transferred to and are available from the ENEA/CCDN.

The microscopic cross sections stored on the KEDAK file were then used to generate (unshielded) group cross sections in the 26 group structure introduced by Abagjan et al. [2] for two different weighting spectra, i.e. the weighting spectrum calculated for the core of a 300 MWe Na cooled fast prototype reactor (Na P-1 spectrum [3]) and the weighting spectrum as used by Abagjan et al. [2].

2. Neutron nuclear data for thermal and resonance energies

(0.001 eV \leq E \leq 1.13 keV)

The most recent and first more comprehensive work on resonances of individual Cd isotopes is due to Adamchuk et al. [4]. These authors performed total and radiative capture cross section and self-indication measurements up to 1.5 keV neutron energy and analysed these in terms of resonance energies and neutron widths up to neutron energies (E_{\max}) as specified in the table below.

| Isotope | E_{\max} (eV) |
|---------|-----------------|
| Cd 110 | 89.6 |
| Cd 111 | 625.0 |
| Cd 112 | 1125 |
| Cd 113 | 858 |
| Cd 114 | 1107 |
| Cd 116 | 29.3 |

In addition for the odd isotopes Cd 111 and Cd 113 quite a number of resonance capture widths and spin values were determined. For most of the resonances the Γ_n and Γ_γ values as obtained by Adamchuk et al. represent the only available information. For the remaining resonances the existing experimental knowledge before Adamchuk's publication is compiled in [5].

The presently recommended resonance parameters are given in table 1. This list comprises only the isotopes Cd 110, 111, 112, 113, 114 and 116; no resonance parameters have so far been measured for the, however, least abundant isotopes Cd 106 (1.215%, [11] and Cd 108 (0.875%, [11]). Where recommended values of resonance energies and neutron widths are given in [5], the average was taken between [5] and Adamchuk, for resonance energies the arithmetic average, for neutron widths the average weighted with the inverse square of the assigned errors. The capture widths are mostly taken from Adamchuk. Average capture widths were determined as arithmetic average of the available experimental data (Cd 111, 113, [4]) or were taken over from references [1] and [5] (Cd 110, 112); they were used for those resonances for which no capture width is known. For Cd 114 and Cd 116 Γ_γ was set equal to Γ_γ of Cd 112. All resonances are assumed to be s-wave. This gives unequivocal J values (1/2) for the resonances of the even isotopes. For the odd isotopes Cd 111 and Cd 113 (I=1/2) in the cases where no resonance spin value had been determined we assumed with Adamchuk a total spin value of 1/2 in order to convert $2g \Gamma_n$ values to Γ_n . The values of E_{\max} given in the table above represent the highest resonance energies for which a full set of resonance parameters is given.

Total, elastic scattering and capture resonance cross sections were calculated from the above resonance parameters for each isotope as a sum of one-level Breit-Wigner terms (many-channel, multi-level random sign approximation as outlined in [6]), however, without the (negligibly small) resonance-resonance interference terms. The potential scattering cross section of Cd was calculated as average weighted with the inverse square of the assigned errors of the rather divergent available experimental information tabulated below. As no isotopic information exists, σ_{pot} was taken the same for all isotopes.

| Reference | Method | $\sigma_{\text{pot}} \text{ (b)}$ |
|-------------------------|--|-----------------------------------|
| Hibdon et al. [7] | transmission measurement | 5.42 ± 0.25 |
| Arnold, Nereson [8] | coherent scattering length measurement | 7.65 ± 0.78 |
| Brockhouse, Stewart [9] | coherent scattering length measurement | 4.83 ± 0.45 |
| Seth et al. [10] | transmission measurement | 5.56 ± 0.47 |

The result is

$$\sigma_{\text{pot}} = 5.47 \pm 0.19 \text{ (b)}$$

from which a "best" value for the nuclear radius

$$R = \sqrt{\frac{\sigma_{\text{pot}}}{4\pi}} = 6.6 \pm 0.1 \text{ (f)}$$

follows.

The isotopic resonance cross sections were multiplied by the natural isotopic abundances and summed up to give the resonance cross sections of natural Cd. The calculations were extended up to 1130 eV, slightly above the highest resonances at 1125 eV in Cd 112 and at 1107 eV in Cd 114. For the other isotopes the highest known resonances are at lower energies. At those energies, for which no resonances are known for an isotope, a statistical theory estimate including only s-waves was made using the well known formulae (see e.g. [6])

$$\langle \sigma_{\gamma} \rangle = 2\pi^2 \lambda^2 \cdot \sum_J \frac{g_J}{D_J} \left\langle \frac{\Gamma_n \Gamma_{\gamma}}{\Gamma} \right\rangle_J$$

$$\langle \sigma_n \rangle = \sigma_{\text{pot}} + 2\pi^2 \lambda^2 \sum_J \frac{g_J}{D_J} \left\langle \frac{\Gamma_n^2}{\Gamma} \right\rangle_J = \sigma_{\text{pot}} + \langle \sigma_n^{\text{res}} \rangle$$

$$\langle \sigma_T \rangle = \langle \sigma_{\gamma} \rangle + \langle \sigma_n \rangle$$

and added to the cross sections of the other isotopes after multiplication with the respective natural isotopic abundance. The energy ranges in which such estimates had to be made and the statistical resonance parameters used for each isotope are given in the table below. Cd 106 and Cd 108 were neglected.

| Isotopes | Natural isotopic abundance [11] | S_0 (10^{-4}) | $\bar{\Gamma}_\gamma$ (meV) | \bar{D}_{obs} (eV) | ΔE (eV) |
|----------|------------------------------------|---------------------|-----------------------------|----------------------|-----------------|
| Cd 110 | 12.39 | 0.45 | 130 | 282 | 380-1130 |
| Cd 111 | 12.75 | 0.46 | 119 | 29.9 | 630-1130 |
| Cd 112 | 24.07 | 0.35 | 115 | 176 | - |
| Cd 113 | 12.26 | 0.50 | 113 | 40.9 | 860-1130 |
| Cd 114 | 28.86 | 0.91 | 115 | 175 | - |
| Cd 116 | 7.58 | 0.91 | 115 | 175 | 35-1130 |

For Cd 111, 112, 113 and 114 the s-wave strength function S_0 was taken from Adamchuk, for Cd 110 it was taken from [1], for Cd 116, for which only one resonance is known, it was arbitrarily set equal to that of Cd 114. The average observed level distances \bar{D}_{obs} were calculated from the resonance positions appearing in table 1 for all isotopes except Cd 116 for which it was arbitrarily set equal to that of Cd 114. The results of these statistical cross-section calculations are plotted in figure 1.

In the thermal energy range, as is well known, the behaviour particularly of the capture cross section, is dominated by the 0.178 eV resonance in Cd 113. Coincidentally the weighted average of the experimental 2200 m/sec capture cross section values given in [5] (2511.5 b) came out almost exactly equal to the value calculated from the resonance parameters of table 1 (2511.9 b). We therefore decided to calculate the cross sections throughout the thermal energy range down to 0.001 eV from the parameters of the positive energy resonances in table 1. It was also not considered necessary and no attempt was made to include possible contributions of "negative" energy resonances.

We would like to emphasize the purely coincidental character of the agreement in σ_γ (2200 m/sec) mentioned above. This comes about mainly by the value of Meadows and Whalen [12] obtained by the pulsed neutron decay technique and by the particularly small error assigned by these authors to their result which gives it a particularly large weight in the averaging. Other authors using the same technique obtained a lower value and assigned a larger error to their measurement (2445 ± 30 b) [13].

Also three independent measurements by Sokolowski et al. [14], Kay and Harris [13] and Jowitt et al. [15] using three different techniques (total cross section with correction for scattering [14], pulsed neutron decay technique [13], pile oscillator [15]) yielded almost exactly the same, but lower values compared to Meadows and Whalen (2445 ± 25 (b) [14], 2445 ± 30 (b) [13], 2444 ± 30 (b) [15]). There is a still lower pile oscillator value available from Sokolowski et al. [14]. All these arguments taken together favour a lower 2200 m/sec value than that adopted here, and the unweighted arithmetic average of 2450 ± 30 (b) recommended in [5] which is about 60 b or 2.5% lower than our value might be more realistic. In a more thorough reevaluation of the Cd cross sections than the present one these facts together with more recent measurements of the thermal capture cross section of Cd should be taken into account.

The resonance cross sections have been calculated as dense in energy as to allow linear interpolation between values at adjacent energies. Because of the very large number of energies covered only a rather small sample of the total amount of resonance cross section values for the energy range 0.001 eV to 20.0 eV is reproduced in this report in table 2. The meaning of the symbols in this table is as outlined in the introduction to reference [16]. The total set of data may be obtained from the ENEA/CCDN.

3. Neutron nuclear data for fast neutron energies ($1.13 \text{ keV} < E \leq 15 \text{ MeV}$)

In the fast neutron energy region the cross sections so far have been taken over almost without change from the evaluation of Drake [1], since most of the data seem still to be valid. For the explanation of the evaluation procedures and documentation of the evaluated data the reader is referred to the mentioned report [1].

A few slight changes need extra mentioning. The first concerns σ_{γ} . Since the deadline of Drake's work new σ_{γ} measurements have been performed by Kompe [17] in the energy range 11.9 keV to 158 keV, using the Karlsruhe Van de Graaff accelerator and a large liquid scintillator. These data originally were normalised to the σ_{γ} (Au) curve recommended by Pönitz

[25] which was obtained by renormalising experimental data in the energy range 1 keV - 1 MeV published by other authors to a "best" value of σ_γ (Au) at 30 keV. Later on Kompe et al. [18] renormalized their σ_γ (Cd) data to the "grey" neutron detector σ_γ (Au) measurements of Pönitz et al. [26] in the energy range 25 to 500 keV which are normalised to a redetermined "best" value of σ_γ (Au) at 30 keV. We used these latter data of Kompe for σ_γ (Cd) [18].

Above 30 keV they are in excellent agreement with the earlier measurements of Gibbons et al. [19], but are slightly lower than these between 20 and 30 keV, and on the average about 15% lower between 10 and 20 keV. This can be seen from figure 2 in which the available σ_γ measurements on Cd in the keV range of neutron energies are plotted. Above 10 keV Drake's recommended σ_γ values correspond to an average curve through the data of Gibbons et al. [19]. We followed Drake's recommendations below 7 and above 30 keV and chose several % lower values between 7 and 30 keV as an average between Gibbons and Kompe. For σ_T kept constant these changes in σ_γ compared to Drake entail slight changes in σ_n and σ_{tr} .

Secondly Drake [1] evaluated Legendre expansion coefficients for elastic scattering f_1^C in the center - of - mass system. We need only the first Legendre expansion coefficient in the laboratory system $f_1^L = \overline{\cos \theta_L} = \overline{\mu_L}$. This was obtained from Drake's f_1^C according to the formula [27]

$$\begin{aligned} \overline{\mu_L} &= \frac{2}{3A} + \left(1 - \frac{3}{5A^2}\right) f_1^C + \left(\frac{4}{7A^3} - \frac{2}{3A}\right) f_2^C + \dots \\ &\cong f_1^C + 0.007742 (1 - f_2^C) \end{aligned}$$

$$\text{for } A(\text{Cd}) = 112.41 \gg 1$$

For isotropic scattering in the center - of - mass system below 100 keV

$$f_l^C = 0 \text{ for } l \geq 1 \text{ and } \overline{\mu_L} = 0.007742$$

Table 2 contains all fast energy cross section data except inelastic excitation cross sections; these are reproduced in table 3.

4. 26 group cross sections

From the microscopic cross sections as discussed in sections 2 and 3 unshielded group cross sections were generated using the 26 energy groups structure introduced by Abagjan et al. [2]. As weighting spectra the neutron energy spectrum calculated for the core of a 300 MWe Na cooled fast prototype reactor (Na P-1 spectrum [3]) and the neutron energy spectrum as used by Abagjan et al. [2] (fission spectrum in the ABN groups 1-3, 1/E-spectrum in the ABN-groups 4 - 25) were applied. The results for the NaP-1 spectrum are given in tables 4 (cross sections) and 5 (inelastic scattering matrix), for the ABN spectrum in tables 6 (cross sections) and 7 (inelastic scattering matrix). The meanings of the group cross section symbols used in these tables are

$$\sigma_a = \sigma_\gamma + \sigma_p + \sigma_\alpha = \text{absorption cross section}$$

$$\sigma_n = \text{elastic scattering cross section}$$

$$\sigma_n^i = \text{inelastic scattering cross section}$$

$$\mu_L = \frac{\mu}{L} = \cos \theta_L$$

$$\begin{aligned} \sigma_{er} &= \sigma_n^{ii+1} = \text{elastic removal cross section} \\ &= \text{cross section for elastic scattering from} \\ &\quad \text{group } i \text{ in the next lower group } i + 1 \end{aligned}$$

$$\sigma_{tr} = \text{transport cross section}$$

$$\begin{aligned} \sigma_n^{ii+k} &= \text{cross section for inelastic scattering from group } i \\ &\quad \text{into group } i + k \end{aligned}$$

The cross sections in the 26 th group are in both group sets identical and are the cross section values at 0.0253 eV.

For the calculation of σ_{er} the improved treatment (compared to that proposed by Yiftah et al. [28]) given by Huschke [3] was used. We shall not reproduce the formulae here, but refer for convenience only to the formulae numbers in Huschke's report. Thus formula 3.14 was used for energies above 100 keV (groups 1-8) together with the formulae 3.9 and 3.13, for energies below 100 keV (groups 9-25) together

with the formulae 3.27 and 3.28.

For the generation of the inelastic scattering matrices in the groups 5-7 the excitation cross sections of individual levels as given in table 3 were used, in the groups 1-4 an evaporation model for the inelastic scattering energy spectra [29] with nuclear temperatures as recommended by Swarczbaum et al. [30] was used.

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Table 1

Recommended parameters of resolved resonances for
stable Cd isotopes

| Isotope | E_r (eV) | Γ_n (meV) | Γ_γ (meV) | l | J |
|-----------------|-------------|------------------|-----------------------|-----|-----|
| Cd 110 I=0 | 89.6 [4,5] | 116,7 [4,5] | 130.0 [1,5] | 0 | 0.5 |
| | 372.0 [4] | 991.0 [1] | 130.0 [1,5] | 0 | 0.5 |
| Cd 111 I=1/2 | 27.7 [5] | 7.7 [4,5] | 119.0 [4] | 0 | 1.0 |
| | 69.5 [4] | 0.136 [4] | 119.0 [4] | 0 | 0.5 |
| | 86.3 [4,5] | 5.2 [4,5] | 119.0 [4] | 0 | 0.5 |
| | 99.6 [4,5] | 13.3 [4,5] | 72.0 [4] | 0 | 1.0 |
| | 103.2 [4] | 1.44 [4] | 119.0 [4] | 0 | 0.5 |
| | 115.0 [4] | 0.66 [4] | 119.0 [4] | 0 | 0.5 |
| | 138.3 [4,5] | 13.0 [4,5] | 119.0 [4] | 0 | 1.0 |
| | 164.3 [4,5] | 44.8 [4,5] | 104.0 [4] | 0 | 1.0 |
| | 225.4 [4,5] | 50.0 [4] | 119.0 [4] | 0 | 0.5 |
| | 233.7 [4,5] | 230.0 [4,5] | 160.0 [4] | 0 | 0.0 |
| | 275.8 [4] | 34.0 [4] | 119.0 [4] | 0 | 0.5 |
| | 314.0 [4] | 5.4 [4] | 119.0 [4] | 0 | 0.5 |
| | 332.2 [4] | 12.0 [4] | 119.0 [4] | 0 | 0.5 |
| | 356.5 [4] | 49.0 [4] | 93.0 [4] | 0 | 1.0 |
| | 389.5 [4] | 124.0 [4] | 90.0 [4] | 0 | 0.0 |
| | 439.0 [4] | 24.0 [4] | 119.0 [4] | 0 | 0.5 |
| | 480.0 [4] | 14.0 [4] | 119.0 [4] | 0 | 0.5 |
| | 541.0 [4] | 126.0 [4] | 119.0 [4] | 0 | 0.5 |
| 578.0 [4] | 296.0 [4] | 150.0 [4] | 0 | 0.0 | |
| 606.0 [4] | 90.0 [4] | 119.0 [4] | 0 | 0.5 | |
| 625.0 [4] | 104.0 [4] | 119.0 [4] | 0 | 0.5 | |
| Cd 112 I = 0 | 66.7 [4,5] | 9.6 [4,5] | 90.0 [5] | 0 | 0.5 |
| | 83.3 [4] | 0.76 [4] | 115.0 [1] | 0 | 0.5 |
| | 226.7 [4,5] | 26.3 [4,5] | 115.0 [1] | 0 | 0.5 |
| | 444.3 [4] | 60.0 [4] | 115.0 [1] | 0 | 0.5 |
| | 743.0 [4] | 180.0 [4] | 115.0 [1] | 0 | 0.5 |
| | 935.0 [4] | 220.0 [4] | 115.0 [1] | 0 | 0.5 |
| | 1125.0 [4] | 600.0 [4] | 115.0 [1] | 0 | 0.5 |

| Isotope | E_r (eV) | Γ_n (meV) | Γ_γ (meV) | I | J |
|-------------------|-------------|------------------|-----------------------|-----|-----|
| Cd 113 I = 1/2 | 0.178 [4,5] | 0.65 [4,5] | 113.0 [4,5] | 0 | 1.0 |
| | 18.4 [4,5] | 0.19 [4,5] | 113.0 [4] | 0 | 1.0 |
| | 56.3 [4] | 0.106 [4] | 113.0 [4] | 0 | 0.5 |
| | 63.9 [4,5] | 3.8 [4,5] | 110.0 [4] | 0 | 1.0 |
| | 84.9 [4,5] | 27.0 [4,5] | 121.0 [4] | 0 | 1.0 |
| | 108.5 [4,5] | 15.0 [4,5] | 128.0 [4] | 0 | 1.0 |
| | 143.9 [4,5] | 6.6 [4,5] | 113.0 [4] | 0 | 0.5 |
| | 159.0 [4,5] | 18.0 [4,5] | 113.0 [4] | 0 | 0.5 |
| | 193.3 [4,5] | 224.0 [4,5] | 112.0 [4] | 0 | 0.0 |
| | 215.7 [4,5] | 24.0 [4,5] | 114.0 [4] | 0 | 1.0 |
| | 261.5 [4] | 45.0 [4] | 106.0 [4] | 0 | 1.0 |
| | 270.0 [4] | 64.0 [4] | 124.0 [4] | 0 | 0.0 |
| | 292.2 [4] | 11.4 [4] | 113.0 [4] | 0 | 0.5 |
| | 415.8 [4] | 140.0 [4] | 116.0 [4] | 0 | 1.0 |
| | 433.8 [4] | 36.0 [4] | 110.0 [4] | 0 | 1.0 |
| | 503.0 [4] | 80.0 [4] | 95.0 [4] | 0 | 1.0 |
| | 527.0 [4] | 44.0 [4] | 100.0 [4] | 0 | 1.0 |
| | 552.0 [4] | 137.0 [4] | 110.0 [4] | 0 | 1.0 |
| | 625.0 [4] | 80.0 [4] | 113.0 [4] | 0 | 0.5 |
| | 675.0 [4] | 190.0 [4] | 113.0 [4] | 0 | 0.5 |
| 724.0 [4] | 53.0 [4] | 113.0 [4] | 0 | 1.0 | |
| 858.0 [4] | 660.0 [4] | 113.0 [4] | 0 | 1.0 | |
| Cd 114 I = 0 | 58.7 [1] | 0.077 [1] | 115.0 | 0 | 0.5 |
| | 120.1 [4,5] | 57.0 [4,5] | | | |
| | 226.0 [4] | 1.8 [4] | | | |
| | 394.1 [4] | 760.0 [4] | | | |
| | 673.0 [4] | 220.0 [4] | | | |
| | 756.0 [4] | 140.0 [4] | | | |
| | 1107.0 [4] | 1500.0 [4] | 115.0 | 0 | 0.5 |
| Cd 116 I = 0 | 29.3 [4] | 0.042 [4] | 115.0 | 0 | 0.5 |

Table 2

MATERIAL CD

Evaluated microscopic cross sections for Cd

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|------------|----------|------------|------------|-----|-------|-------|------------|
| 1.0000E-3 | 23.0259 | 9712.44100 | 6.83980 | 9712.38800 | 9705.60100 | 0.0 | 0.0 | 0.0 | 9705.60100 |
| 2.0000E-3 | 22.3327 | 6940.58700 | 6.87024 | 6940.53400 | 6933.71700 | 0.0 | 0.0 | 0.0 | 6933.71700 |
| 3.0000E-3 | 21.9272 | 5726.95000 | 6.90122 | 5726.89700 | 5720.04900 | 0.0 | 0.0 | 0.0 | 5720.04900 |
| 4.0000E-3 | 21.6396 | 5012.23600 | 6.93277 | 5012.18200 | 5005.30300 | 0.0 | 0.0 | 0.0 | 5005.30300 |
| 5.0000E-3 | 21.4164 | 4530.69100 | 6.96488 | 4530.63700 | 4523.72600 | 0.0 | 0.0 | 0.0 | 4523.72600 |
| 6.0000E-3 | 21.2341 | 4179.99100 | 6.99758 | 4179.93700 | 4172.99400 | 0.0 | 0.0 | 0.0 | 4172.99400 |
| 7.0000E-3 | 21.0799 | 3911.28100 | 7.03088 | 3911.22700 | 3904.25100 | 0.0 | 0.0 | 0.0 | 3904.25100 |
| 8.0000E-3 | 20.9464 | 3697.91500 | 7.06478 | 3697.86000 | 3690.85000 | 0.0 | 0.0 | 0.0 | 3690.85000 |
| 9.0000E-3 | 20.8286 | 3523.97100 | 7.09931 | 3523.91600 | 3516.87200 | 0.0 | 0.0 | 0.0 | 3516.87200 |
| 10.0000E-3 | 20.7233 | 3379.27700 | 7.13447 | 3379.22100 | 3372.14200 | 0.0 | 0.0 | 0.0 | 3372.14200 |
| 15.0000E-3 | 20.3178 | 2913.57400 | 7.32029 | 2913.51800 | 2906.25400 | 0.0 | 0.0 | 0.0 | 2906.25400 |
| 20.0000E-3 | 20.0301 | 2667.68800 | 7.52423 | 2667.63000 | 2660.16400 | 0.0 | 0.0 | 0.0 | 2660.16400 |
| 25.0000E-3 | 19.7950 | 2519.64300 | 7.76256 | 2519.58300 | 2511.88100 | 0.0 | 0.0 | 0.0 | 2511.88100 |
| 30.0000E-3 | 19.6247 | 2444.44100 | 7.99525 | 2444.37900 | 2436.44600 | 0.0 | 0.0 | 0.0 | 2436.44600 |
| 40.0000E-3 | 19.3370 | 2389.51700 | 8.56833 | 2389.45100 | 2380.94900 | 0.0 | 0.0 | 0.0 | 2380.94900 |
| 50.0000E-3 | 19.1138 | 2427.66400 | 9.27057 | 2427.59200 | 2418.39400 | 0.0 | 0.0 | 0.0 | 2418.39400 |
| 60.0000E-3 | 18.9315 | 2534.41900 | 10.13751 | 2534.34000 | 2524.28100 | 0.0 | 0.0 | 0.0 | 2524.28100 |
| 65.0000E-3 | 18.8515 | 2610.98500 | 10.64681 | 2610.90300 | 2600.33800 | 0.0 | 0.0 | 0.0 | 2600.33800 |
| 70.0000E-3 | 18.7774 | 2702.87300 | 11.21583 | 2702.78600 | 2691.65800 | 0.0 | 0.0 | 0.0 | 2691.65800 |
| 75.0000E-3 | 18.7084 | 2810.48500 | 11.85273 | 2810.39300 | 2798.63300 | 0.0 | 0.0 | 0.0 | 2798.63300 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 1.0000E-3 | 23.0259 | 0.0 | 0.0 | 9705.60100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.0000E-3 | 22.3327 | 0.0 | 0.0 | 6933.71700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.0000E-3 | 21.9272 | 0.0 | 0.0 | 5720.04900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.0000E-3 | 21.6396 | 0.0 | 0.0 | 5005.30300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.0000E-3 | 21.4164 | 0.0 | 0.0 | 4523.72600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.0000E-3 | 21.2341 | 0.0 | 0.0 | 4172.99400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.0000E-3 | 21.0799 | 0.0 | 0.0 | 3904.25100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.0000E-3 | 20.9464 | 0.0 | 0.0 | 3690.85000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9.0000E-3 | 20.8286 | 0.0 | 0.0 | 3516.87200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.0000E-3 | 20.7233 | 0.0 | 0.0 | 3372.14200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.0000E-3 | 20.3178 | 0.0 | 0.0 | 2906.25400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 20.0000E-3 | 20.0301 | 0.0 | 0.0 | 2660.16400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 25.0000E-3 | 19.7950 | 0.0 | 0.0 | 2511.88100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 30.0000E-3 | 19.6247 | 0.0 | 0.0 | 2436.44600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 40.0000E-3 | 19.3370 | 0.0 | 0.0 | 2380.94900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 50.0000E-3 | 19.1138 | 0.0 | 0.0 | 2418.39400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 60.0000E-3 | 18.9315 | 0.0 | 0.0 | 2524.28100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 65.0000E-3 | 18.8515 | 0.0 | 0.0 | 2600.33800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70.0000E-3 | 18.7774 | 0.0 | 0.0 | 2691.65800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75.0000E-3 | 18.7084 | 0.0 | 0.0 | 2798.63300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|---------|------------|----------|------------|------------|-----|-----|-------|------------|
| 80.0000E-3 | 18.6438 | 2934.53500 | 12.56679 | 2934.43800 | 2921.96800 | 0.0 | 0.0 | 0.0 | 2921.96800 |
| 85.0000E-3 | 18.5832 | 3076.00000 | 13.36859 | 3075.89700 | 3062.63200 | 0.0 | 0.0 | 0.0 | 3062.63200 |
| 90.0000E-3 | 18.5260 | 3236.07900 | 14.27007 | 3235.96900 | 3221.80900 | 0.0 | 0.0 | 0.0 | 3221.80900 |
| 95.0000E-3 | 18.4720 | 3416.14600 | 15.28462 | 3416.02700 | 3400.86100 | 0.0 | 0.0 | 0.0 | 3400.86100 |
| 100.0000E-3 | 18.4207 | 3617.68800 | 16.42704 | 3617.56100 | 3601.26100 | 0.0 | 0.0 | 0.0 | 3601.26100 |
| 110.0000E-3 | 18.3254 | 4091.18400 | 19.16058 | 4091.03500 | 4072.02300 | 0.0 | 0.0 | 0.0 | 4072.02300 |
| 120.0000E-3 | 18.2384 | 4666.32900 | 22.60499 | 4666.15400 | 4643.72400 | 0.0 | 0.0 | 0.0 | 4643.72400 |
| 130.0000E-3 | 18.1583 | 5343.12700 | 26.87238 | 5342.91900 | 5316.25500 | 0.0 | 0.0 | 0.0 | 5316.25500 |
| 140.0000E-3 | 18.0842 | 6097.61100 | 31.97489 | 6097.36300 | 6065.63600 | 0.0 | 0.0 | 0.0 | 6065.63600 |
| 150.0000E-3 | 18.0152 | 6861.38000 | 37.68650 | 6861.08800 | 6823.69400 | 0.0 | 0.0 | 0.0 | 6823.69400 |
| 160.0000E-3 | 17.9507 | 7505.76500 | 43.38217 | 7505.42900 | 7462.38300 | 0.0 | 0.0 | 0.0 | 7462.38300 |
| 165.0000E-3 | 17.9199 | 7729.54400 | 45.90749 | 7729.18800 | 7683.63600 | 0.0 | 0.0 | 0.0 | 7683.63600 |
| 170.0000E-3 | 17.8901 | 7859.17700 | 48.01743 | 7858.80600 | 7811.16000 | 0.0 | 0.0 | 0.0 | 7811.16000 |
| 172.0000E-3 | 17.8784 | 7880.92100 | 48.71313 | 7880.54400 | 7832.20800 | 0.0 | 0.0 | 0.0 | 7832.20800 |
| 174.0000E-3 | 17.8668 | 7884.37000 | 49.31238 | 7883.98800 | 7835.05800 | 0.0 | 0.0 | 0.0 | 7835.05800 |
| 176.0000E-3 | 17.8554 | 7869.13700 | 49.80895 | 7868.75100 | 7819.32800 | 0.0 | 0.0 | 0.0 | 7819.32800 |
| 178.0000E-3 | 17.8441 | 7835.10500 | 50.19801 | 7834.71600 | 7784.90700 | 0.0 | 0.0 | 0.0 | 7784.90700 |
| 180.0000E-3 | 17.8329 | 7782.43500 | 50.47625 | 7782.04400 | 7731.95900 | 0.0 | 0.0 | 0.0 | 7731.95900 |
| 182.0000E-3 | 17.8218 | 7711.56600 | 50.64205 | 7711.17300 | 7660.92400 | 0.0 | 0.0 | 0.0 | 7660.92400 |
| 184.0000E-3 | 17.8109 | 7623.20000 | 50.69541 | 7622.80700 | 7572.50400 | 0.0 | 0.0 | 0.0 | 7572.50400 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|-------------|---------|-----|------|------------|---------|-----|-------|-----|------|
| 80.0000E-3 | 18.6438 | 0.0 | 0.0 | 2921.96800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85.0000E-3 | 18.5832 | 0.0 | 0.0 | 3062.63200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90.0000E-3 | 18.5260 | 0.0 | 0.0 | 3221.80900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 95.0000E-3 | 18.4720 | 0.0 | 0.0 | 3400.86100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 100.0000E-3 | 18.4207 | 0.0 | 0.0 | 3601.26100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 110.0000E-3 | 18.3254 | 0.0 | 0.0 | 4072.02300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 120.0000E-3 | 18.2384 | 0.0 | 0.0 | 4643.72400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 130.0000E-3 | 18.1583 | 0.0 | 0.0 | 5316.25500 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 140.0000E-3 | 18.0842 | 0.0 | 0.0 | 6065.63600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 150.0000E-3 | 18.0152 | 0.0 | 0.0 | 6823.69400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 160.0000E-3 | 17.9507 | 0.0 | 0.0 | 7462.38300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 165.0000E-3 | 17.9199 | 0.0 | 0.0 | 7683.63600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 170.0000E-3 | 17.8901 | 0.0 | 0.0 | 7811.16000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 172.0000E-3 | 17.8784 | 0.0 | 0.0 | 7832.20800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 174.0000E-3 | 17.8668 | 0.0 | 0.0 | 7835.05800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 176.0000E-3 | 17.8554 | 0.0 | 0.0 | 7819.32800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 178.0000E-3 | 17.8441 | 0.0 | 0.0 | 7784.90700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180.0000E-3 | 17.8329 | 0.0 | 0.0 | 7731.95900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 182.0000E-3 | 17.8218 | 0.0 | 0.0 | 7660.92400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 184.0000E-3 | 17.8109 | 0.0 | 0.0 | 7572.50400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| | E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|---------|------------|----------|------------|------------|---------|-----|-------|------------|------|
| 186.0000E-3 | 17.8001 | 7518.28100 | 50.63800 | 7517.88900 | 7467.64300 | 0.0 | 0.0 | 0.0 | 7467.64300 | |
| 188.0000E-3 | 17.7894 | 7397.96600 | 50.47303 | 7397.57500 | 7347.49300 | 0.0 | 0.0 | 0.0 | 7347.49300 | |
| 190.0000E-3 | 17.7788 | 7263.58700 | 50.20511 | 7263.19800 | 7213.38200 | 0.0 | 0.0 | 0.0 | 7213.38200 | |
| 195.0000E-3 | 17.7529 | 6875.96200 | 49.12573 | 6875.58100 | 6826.83600 | 0.0 | 0.0 | 0.0 | 6826.83600 | |
| 200.0000E-3 | 17.7275 | 6434.50500 | 47.55662 | 6434.13600 | 6386.94800 | 0.0 | 0.0 | 0.0 | 6386.94800 | |
| 210.0000E-3 | 17.6787 | 5485.11700 | 43.47456 | 5484.78100 | 5441.64300 | 0.0 | 0.0 | 0.0 | 5441.64300 | |
| 220.0000E-3 | 17.6322 | 4567.51500 | 38.91457 | 4567.21400 | 4528.60100 | 0.0 | 0.0 | 0.0 | 4528.60100 | |
| 230.0000E-3 | 17.5878 | 3761.87100 | 34.51662 | 3761.60400 | 3727.35400 | 0.0 | 0.0 | 0.0 | 3727.35400 | |
| 240.0000E-3 | 17.5452 | 3091.36600 | 30.58918 | 3091.13000 | 3060.77700 | 0.0 | 0.0 | 0.0 | 3060.77700 | |
| 250.0000E-3 | 17.5044 | 2548.50700 | 27.22108 | 2548.29700 | 2521.28600 | 0.0 | 0.0 | 0.0 | 2521.28600 | |
| 260.0000E-3 | 17.4652 | 2114.18800 | 24.38944 | 2114.00000 | 2089.79900 | 0.0 | 0.0 | 0.0 | 2089.79900 | |
| 270.0000E-3 | 17.4274 | 1767.60700 | 22.02761 | 1767.43600 | 1745.57900 | 0.0 | 0.0 | 0.0 | 1745.57900 | |
| 280.0000E-3 | 17.3911 | 1490.26900 | 20.05963 | 1490.11400 | 1470.21000 | 0.0 | 0.0 | 0.0 | 1470.21000 | |
| 290.0000E-3 | 17.3560 | 1267.06000 | 18.41505 | 1266.91700 | 1248.64500 | 0.0 | 0.0 | 0.0 | 1248.64500 | |
| 300.0000E-3 | 17.3221 | 1086.09800 | 17.03371 | 1085.96600 | 1069.06400 | 0.0 | 0.0 | 0.0 | 1069.06400 | |
| 310.0000E-3 | 17.2893 | 938.21200 | 15.86627 | 938.08900 | 922.34500 | 0.0 | 0.0 | 0.0 | 922.34500 | |
| 320.0000E-3 | 17.2575 | 816.36500 | 14.87300 | 816.25000 | 801.49200 | 0.0 | 0.0 | 0.0 | 801.49200 | |
| 330.0000E-3 | 17.2268 | 715.16400 | 14.02216 | 715.05600 | 701.14200 | 0.0 | 0.0 | 0.0 | 701.14200 | |
| 340.0000E-3 | 17.1969 | 630.45600 | 13.28845 | 630.35300 | 617.16700 | 0.0 | 0.0 | 0.0 | 617.16700 | |
| 350.0000E-3 | 17.1679 | 559.02600 | 12.65166 | 558.92800 | 546.37400 | 0.0 | 0.0 | 0.0 | 546.37400 | |
| | E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 186.0000E-3 | 17.8001 | 0.0 | 0.0 | 0.0 | 7467.64300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 188.0000E-3 | 17.7894 | 0.0 | 0.0 | 0.0 | 7347.49300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 190.0000E-3 | 17.7788 | 0.0 | 0.0 | 0.0 | 7213.38200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 195.0000E-3 | 17.7529 | 0.0 | 0.0 | 0.0 | 6826.83600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 200.0000E-3 | 17.7275 | 0.0 | 0.0 | 0.0 | 6386.94800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 210.0000E-3 | 17.6787 | 0.0 | 0.0 | 0.0 | 5441.64300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 220.0000E-3 | 17.6322 | 0.0 | 0.0 | 0.0 | 4528.60100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 230.0000E-3 | 17.5878 | 0.0 | 0.0 | 0.0 | 3727.35400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 240.0000E-3 | 17.5452 | 0.0 | 0.0 | 0.0 | 3060.77700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 250.0000E-3 | 17.5044 | 0.0 | 0.0 | 0.0 | 2521.28600 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 260.0000E-3 | 17.4652 | 0.0 | 0.0 | 0.0 | 2089.79900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 270.0000E-3 | 17.4274 | 0.0 | 0.0 | 0.0 | 1745.57900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 280.0000E-3 | 17.3911 | 0.0 | 0.0 | 0.0 | 1470.21000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 290.0000E-3 | 17.3560 | 0.0 | 0.0 | 0.0 | 1248.64500 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 300.0000E-3 | 17.3221 | 0.0 | 0.0 | 0.0 | 1069.06400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 310.0000E-3 | 17.2893 | 0.0 | 0.0 | 0.0 | 922.34500 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 320.0000E-3 | 17.2575 | 0.0 | 0.0 | 0.0 | 801.49200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 330.0000E-3 | 17.2268 | 0.0 | 0.0 | 0.0 | 701.14200 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 340.0000E-3 | 17.1969 | 0.0 | 0.0 | 0.0 | 617.16700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 350.0000E-3 | 17.1679 | 0.0 | 0.0 | 0.0 | 546.37400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|---------|-----------|----------|-----------|-----------|-----|-----|-------|-----------|
| 360.0000E-3 | 17.1397 | 498.37100 | 12.09559 | 498.27700 | 486.27500 | 0.0 | 0.0 | 0.0 | 486.27500 |
| 370.0000E-3 | 17.1123 | 446.52600 | 11.60717 | 446.43600 | 434.91800 | 0.0 | 0.0 | 0.0 | 434.91800 |
| 380.0000E-3 | 17.0857 | 401.93700 | 11.17582 | 401.85000 | 390.76100 | 0.0 | 0.0 | 0.0 | 390.76100 |
| 390.0000E-3 | 17.0597 | 363.36600 | 10.79291 | 363.28300 | 352.57300 | 0.0 | 0.0 | 0.0 | 352.57300 |
| 400.0000E-3 | 17.0344 | 329.82000 | 10.45137 | 329.73900 | 319.36900 | 0.0 | 0.0 | 0.0 | 319.36900 |
| 410.0000E-3 | 17.0097 | 300.49700 | 10.14533 | 300.41800 | 290.35100 | 0.0 | 0.0 | 0.0 | 290.35100 |
| 414.0000E-3 | 17.0000 | 289.79900 | 10.03174 | 289.72100 | 279.76700 | 0.0 | 0.0 | 0.0 | 279.76700 |
| 420.0000E-3 | 16.9856 | 274.74100 | 9.86995 | 274.66500 | 264.87100 | 0.0 | 0.0 | 0.0 | 264.87100 |
| 430.0000E-3 | 16.9621 | 252.01900 | 9.62117 | 251.94500 | 242.39800 | 0.0 | 0.0 | 0.0 | 242.39800 |
| 440.0000E-3 | 16.9391 | 231.88900 | 9.39559 | 231.81600 | 222.49300 | 0.0 | 0.0 | 0.0 | 222.49300 |
| 450.0000E-3 | 16.9166 | 213.98400 | 9.19031 | 213.91300 | 204.79400 | 0.0 | 0.0 | 0.0 | 204.79400 |
| 460.0000E-3 | 16.8946 | 198.00100 | 9.00291 | 197.93100 | 188.99800 | 0.0 | 0.0 | 0.0 | 188.99800 |
| 470.0000E-3 | 16.8731 | 183.68200 | 8.83128 | 183.61400 | 174.85100 | 0.0 | 0.0 | 0.0 | 174.85100 |
| 475.0000E-3 | 16.8625 | 177.07800 | 8.75082 | 177.01000 | 168.32700 | 0.0 | 0.0 | 0.0 | 168.32700 |
| 480.0000E-3 | 16.8521 | 170.81200 | 8.67366 | 170.74500 | 162.13900 | 0.0 | 0.0 | 0.0 | 162.13900 |
| 490.0000E-3 | 16.8314 | 159.20900 | 8.52849 | 159.14300 | 150.68100 | 0.0 | 0.0 | 0.0 | 150.68100 |
| 500.0000E-3 | 16.8112 | 148.71700 | 8.39444 | 148.65200 | 140.32300 | 0.0 | 0.0 | 0.0 | 140.32300 |
| 532.0000E-3 | 16.7492 | 121.17800 | 8.02770 | 121.11500 | 113.15000 | 0.0 | 0.0 | 0.0 | 113.15000 |
| 550.0000E-3 | 16.7159 | 108.87200 | 7.85537 | 108.81100 | 101.01700 | 0.0 | 0.0 | 0.0 | 101.01700 |
| 575.0000E-3 | 16.6715 | 94.63882 | 7.64777 | 94.57961 | 86.99105 | 0.0 | 0.0 | 0.0 | 86.99105 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|-------------|---------|-----|------|-----------|---------|-----|-------|-----|------|
| 360.0000E-3 | 17.1397 | 0.0 | 0.0 | 486.27500 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 370.0000E-3 | 17.1123 | 0.0 | 0.0 | 434.91800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 380.0000E-3 | 17.0857 | 0.0 | 0.0 | 390.76100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 390.0000E-3 | 17.0597 | 0.0 | 0.0 | 352.57300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 400.0000E-3 | 17.0344 | 0.0 | 0.0 | 319.36900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 410.0000E-3 | 17.0097 | 0.0 | 0.0 | 290.35100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 414.0000E-3 | 17.0000 | 0.0 | 0.0 | 279.76700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 420.0000E-3 | 16.9856 | 0.0 | 0.0 | 264.87100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 430.0000E-3 | 16.9621 | 0.0 | 0.0 | 242.39800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 440.0000E-3 | 16.9391 | 0.0 | 0.0 | 222.49300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 450.0000E-3 | 16.9166 | 0.0 | 0.0 | 204.79400 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 460.0000E-3 | 16.8946 | 0.0 | 0.0 | 188.99800 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 470.0000E-3 | 16.8731 | 0.0 | 0.0 | 174.85100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 475.0000E-3 | 16.8625 | 0.0 | 0.0 | 168.32700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 480.0000E-3 | 16.8521 | 0.0 | 0.0 | 162.13900 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 490.0000E-3 | 16.8314 | 0.0 | 0.0 | 150.68100 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 500.0000E-3 | 16.8112 | 0.0 | 0.0 | 140.32300 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 532.0000E-3 | 16.7492 | 0.0 | 0.0 | 113.15000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 550.0000E-3 | 16.7159 | 0.0 | 0.0 | 101.01700 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 575.0000E-3 | 16.6715 | 0.0 | 0.0 | 86.99105 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|---------|----------|---------|----------|----------|-----|-------|-------|----------|
| 590.0000E-3 | 16.6457 | 87.39357 | 7.53805 | 87.33521 | 79.85552 | 0.0 | 0.0 | 0.0 | 79.85552 |
| 600.0000E-3 | 16.6289 | 83.01651 | 7.47024 | 82.95867 | 75.54627 | 0.0 | 0.0 | 0.0 | 75.54627 |
| 625.0000E-3 | 16.5881 | 73.42008 | 7.31697 | 73.36344 | 66.10312 | 0.0 | 0.0 | 0.0 | 66.10312 |
| 650.0000E-3 | 16.5489 | 65.41690 | 7.18350 | 65.36129 | 58.23341 | 0.0 | 0.0 | 0.0 | 58.23341 |
| 683.0000E-3 | 16.4994 | 56.75258 | 7.03188 | 56.69814 | 49.72070 | 0.0 | 0.0 | 0.0 | 49.72070 |
| 700.0000E-3 | 16.4748 | 52.96798 | 6.96288 | 52.91407 | 46.00510 | 0.0 | 0.0 | 0.0 | 46.00510 |
| 750.0000E-3 | 16.4058 | 43.88050 | 6.78856 | 43.82795 | 37.09195 | 0.0 | 0.0 | 0.0 | 37.09195 |
| 800.0000E-3 | 16.3412 | 37.07009 | 6.64776 | 37.01863 | 30.42233 | 0.0 | 0.0 | 0.0 | 30.42233 |
| 850.0000E-3 | 16.2806 | 31.85121 | 6.53193 | 31.80064 | 25.31928 | 0.0 | 0.0 | 0.0 | 25.31928 |
| 876.0000E-3 | 16.2505 | 29.61073 | 6.47953 | 29.56057 | 23.13121 | 0.0 | 0.0 | 0.0 | 23.13121 |
| 890.0000E-3 | 16.2346 | 28.51484 | 6.45320 | 28.46488 | 22.06164 | 0.0 | 0.0 | 0.0 | 22.06164 |
| 910.0000E-3 | 16.2124 | 27.06803 | 6.41767 | 27.01834 | 20.65036 | 0.0 | 0.0 | 0.0 | 20.65036 |
| 930.0000E-3 | 16.1907 | 25.74684 | 6.38439 | 25.69742 | 19.36245 | 0.0 | 0.0 | 0.0 | 19.36245 |
| 950.0000E-3 | 16.1694 | 24.53754 | 6.35316 | 24.48835 | 18.18438 | 0.0 | 0.0 | 0.0 | 18.18438 |
| 970.0000E-3 | 16.1486 | 23.42819 | 6.32380 | 23.37923 | 17.10439 | 0.0 | 0.0 | 0.0 | 17.10439 |
| 980.0000E-3 | 16.1383 | 22.90769 | 6.30977 | 22.85884 | 16.59792 | 0.0 | 0.0 | 0.0 | 16.59792 |
| 990.0000E-3 | 16.1281 | 22.40837 | 6.29615 | 22.35963 | 16.11222 | 0.0 | 0.0 | 0.0 | 16.11222 |
| 1.0250E00 | 16.0934 | 20.81234 | 6.25146 | 20.76394 | 14.56088 | 0.0 | 0.0 | 0.0 | 14.56088 |
| 1.0500E00 | 16.0693 | 19.80035 | 6.22211 | 19.75218 | 13.57824 | 0.0 | 0.0 | 0.0 | 13.57824 |
| 1.0600E00 | 16.0598 | 19.42207 | 6.21092 | 19.37399 | 13.21115 | 0.0 | 0.0 | 0.0 | 13.21115 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 590.0000E-3 | 16.6457 | 0.0 | 0.0 | 79.85552 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 600.0000E-3 | 16.6289 | 0.0 | 0.0 | 75.54627 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 625.0000E-3 | 16.5881 | 0.0 | 0.0 | 66.10312 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 650.0000E-3 | 16.5489 | 0.0 | 0.0 | 58.23341 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 683.0000E-3 | 16.4994 | 0.0 | 0.0 | 49.72070 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 700.0000E-3 | 16.4748 | 0.0 | 0.0 | 46.00510 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 750.0000E-3 | 16.4058 | 0.0 | 0.0 | 37.09195 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 800.0000E-3 | 16.3412 | 0.0 | 0.0 | 30.42233 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 850.0000E-3 | 16.2806 | 0.0 | 0.0 | 25.31928 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 876.0000E-3 | 16.2505 | 0.0 | 0.0 | 23.13121 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 890.0000E-3 | 16.2346 | 0.0 | 0.0 | 22.06164 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 910.0000E-3 | 16.2124 | 0.0 | 0.0 | 20.65036 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 930.0000E-3 | 16.1907 | 0.0 | 0.0 | 19.36245 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 950.0000E-3 | 16.1694 | 0.0 | 0.0 | 18.18438 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 970.0000E-3 | 16.1486 | 0.0 | 0.0 | 17.10439 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 980.0000E-3 | 16.1383 | 0.0 | 0.0 | 16.59792 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 990.0000E-3 | 16.1281 | 0.0 | 0.0 | 16.11222 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0250E00 | 16.0934 | 0.0 | 0.0 | 14.56088 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0500E00 | 16.0693 | 0.0 | 0.0 | 13.57824 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0600E00 | 16.0598 | 0.0 | 0.0 | 13.21115 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-----------|---------|----------|---------|----------|----------|-----|-----|-------|----------|
| 1.0700E00 | 16.0504 | 19.05786 | 6.20003 | 19.00985 | 12.85783 | 0.0 | 0.0 | 0.0 | 12.85783 |
| 1.0800E00 | 16.0411 | 18.70703 | 6.18942 | 18.65911 | 12.51761 | 0.0 | 0.0 | 0.0 | 12.51761 |
| 1.0900E00 | 16.0319 | 18.36897 | 6.17908 | 18.32113 | 12.18989 | 0.0 | 0.0 | 0.0 | 12.18989 |
| 1.1100E00 | 16.0137 | 17.72881 | 6.15918 | 17.68112 | 11.56962 | 0.0 | 0.0 | 0.0 | 11.56962 |
| 1.1250E00 | 16.0003 | 17.27801 | 6.14490 | 17.23043 | 11.13311 | 0.0 | 0.0 | 0.0 | 11.13311 |
| 1.1300E00 | 15.9959 | 17.13299 | 6.14026 | 17.08545 | 10.99273 | 0.0 | 0.0 | 0.0 | 10.99273 |
| 1.1500E00 | 15.9783 | 16.57764 | 6.12225 | 16.53024 | 10.45539 | 0.0 | 0.0 | 0.0 | 10.45539 |
| 1.2000E00 | 15.9358 | 15.34429 | 6.08079 | 15.29721 | 9.26351 | 0.0 | 0.0 | 0.0 | 9.26351 |
| 1.2500E00 | 15.8950 | 14.29762 | 6.04379 | 14.25083 | 8.25383 | 0.0 | 0.0 | 0.0 | 8.25383 |
| 1.3000E00 | 15.8557 | 13.40263 | 6.01057 | 13.35609 | 7.39205 | 0.0 | 0.0 | 0.0 | 7.39205 |
| 1.3500E00 | 15.8180 | 12.63204 | 5.98061 | 12.58574 | 6.65143 | 0.0 | 0.0 | 0.0 | 6.65143 |
| 1.4400E00 | 15.7535 | 11.49266 | 5.93347 | 11.44673 | 5.55919 | 0.0 | 0.0 | 0.0 | 5.55919 |
| 1.5000E00 | 15.7126 | 10.87256 | 5.90609 | 10.82683 | 4.96647 | 0.0 | 0.0 | 0.0 | 4.96647 |
| 1.6000E00 | 15.6481 | 10.02633 | 5.86623 | 9.98091 | 4.16010 | 0.0 | 0.0 | 0.0 | 4.16010 |
| 1.7000E00 | 15.5875 | 9.35853 | 5.83223 | 9.31337 | 3.52630 | 0.0 | 0.0 | 0.0 | 3.52630 |
| 1.7800E00 | 15.5415 | 8.92139 | 5.80844 | 8.87642 | 3.11295 | 0.0 | 0.0 | 0.0 | 3.11295 |
| 1.8600E00 | 15.4975 | 8.55181 | 5.78716 | 8.50701 | 2.76465 | 0.0 | 0.0 | 0.0 | 2.76465 |
| 1.9000E00 | 15.4762 | 8.38818 | 5.77734 | 8.34346 | 2.61084 | 0.0 | 0.0 | 0.0 | 2.61084 |
| 2.0000E00 | 15.4249 | 8.03029 | 5.75488 | 7.98574 | 2.27542 | 0.0 | 0.0 | 0.0 | 2.27542 |
| 2.1000E00 | 15.3762 | 7.73264 | 5.73498 | 7.68824 | 1.99767 | 0.0 | 0.0 | 0.0 | 1.99767 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|-----------|---------|-----|------|----------|---------|-----|-------|-----|------|
| 1.0700E00 | 16.0504 | 0.0 | 0.0 | 12.85783 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0800E00 | 16.0411 | 0.0 | 0.0 | 12.51761 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0900E00 | 16.0319 | 0.0 | 0.0 | 12.18989 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.1100E00 | 16.0137 | 0.0 | 0.0 | 11.56962 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.1250E00 | 16.0003 | 0.0 | 0.0 | 11.13311 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.1300E00 | 15.9959 | 0.0 | 0.0 | 10.99273 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.1500E00 | 15.9783 | 0.0 | 0.0 | 10.45539 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.2000E00 | 15.9358 | 0.0 | 0.0 | 9.26351 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.2500E00 | 15.8950 | 0.0 | 0.0 | 8.25383 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.3000E00 | 15.8557 | 0.0 | 0.0 | 7.39205 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.3500E00 | 15.8180 | 0.0 | 0.0 | 6.65143 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.4400E00 | 15.7535 | 0.0 | 0.0 | 5.55919 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.5000E00 | 15.7126 | 0.0 | 0.0 | 4.96647 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.6000E00 | 15.6481 | 0.0 | 0.0 | 4.16010 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.7000E00 | 15.5875 | 0.0 | 0.0 | 3.52630 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.7800E00 | 15.5415 | 0.0 | 0.0 | 3.11295 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.8600E00 | 15.4975 | 0.0 | 0.0 | 2.76465 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.9000E00 | 15.4762 | 0.0 | 0.0 | 2.61084 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.0000E00 | 15.4249 | 0.0 | 0.0 | 2.27542 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.1000E00 | 15.3762 | 0.0 | 0.0 | 1.99767 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-----------|---------|---------|---------|---------|---------|-----|-------|-------|---------|
| 2.2000E00 | 15.3296 | 7.48267 | 5.71723 | 7.43841 | 1.76544 | 0.0 | 0.0 | 0.0 | 1.76544 |
| 2.2900E00 | 15.2895 | 7.29056 | 5.70282 | 7.24641 | 1.58774 | 0.0 | 0.0 | 0.0 | 1.58774 |
| 2.3300E00 | 15.2722 | 7.21365 | 5.69684 | 7.16954 | 1.51681 | 0.0 | 0.0 | 0.0 | 1.51681 |
| 2.3800E00 | 15.2510 | 7.12398 | 5.68969 | 7.07993 | 1.43429 | 0.0 | 0.0 | 0.0 | 1.43429 |
| 2.4000E00 | 15.2426 | 7.08999 | 5.68693 | 7.04596 | 1.40305 | 0.0 | 0.0 | 0.0 | 1.40305 |
| 2.5000E00 | 15.2018 | 6.93436 | 5.67390 | 6.89044 | 1.26047 | 0.0 | 0.0 | 0.0 | 1.26047 |
| 2.6000E00 | 15.1626 | 6.79958 | 5.66202 | 6.75574 | 1.13756 | 0.0 | 0.0 | 0.0 | 1.13756 |
| 2.7000E00 | 15.1248 | 6.68212 | 5.65116 | 6.63837 | 1.03097 | 0.0 | 0.0 | 0.0 | 1.03097 |
| 2.8000E00 | 15.0885 | 6.57918 | 5.64117 | 6.53551 | 0.93801 | 0.0 | 0.0 | 0.0 | 0.93801 |
| 2.9000E00 | 15.0534 | 6.48850 | 5.63197 | 6.44490 | 0.85653 | 0.0 | 0.0 | 0.0 | 0.85653 |
| 3.0000E00 | 15.0195 | 6.40822 | 5.62346 | 6.36468 | 0.78475 | 0.0 | 0.0 | 0.0 | 0.78475 |
| 3.2000E00 | 14.9549 | 6.27306 | 5.60822 | 6.22965 | 0.66484 | 0.0 | 0.0 | 0.0 | 0.66484 |
| 3.4000E00 | 14.8943 | 6.16446 | 5.59497 | 6.12114 | 0.56949 | 0.0 | 0.0 | 0.0 | 0.56949 |
| 3.6000E00 | 14.8372 | 6.07591 | 5.58332 | 6.03269 | 0.49259 | 0.0 | 0.0 | 0.0 | 0.49259 |
| 3.8000E00 | 14.7831 | 6.00280 | 5.57301 | 5.95966 | 0.42980 | 0.0 | 0.0 | 0.0 | 0.42980 |
| 4.0000E00 | 14.7318 | 5.94175 | 5.56380 | 5.89867 | 0.37795 | 0.0 | 0.0 | 0.0 | 0.37795 |
| 4.2000E00 | 14.6830 | 5.89023 | 5.55553 | 5.84722 | 0.33470 | 0.0 | 0.0 | 0.0 | 0.33470 |
| 4.4000E00 | 14.6365 | 5.84636 | 5.54805 | 5.80341 | 0.29832 | 0.0 | 0.0 | 0.0 | 0.29832 |
| 4.6000E00 | 14.5920 | 5.80870 | 5.54124 | 5.76580 | 0.26746 | 0.0 | 0.0 | 0.0 | 0.26746 |
| 4.8000E00 | 14.5495 | 5.77611 | 5.53503 | 5.73326 | 0.24108 | 0.0 | 0.0 | 0.0 | 0.24108 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 2.2000E00 | 15.3296 | 0.0 | 0.0 | 1.76544 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.2900E00 | 15.2895 | 0.0 | 0.0 | 1.58774 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.3300E00 | 15.2722 | 0.0 | 0.0 | 1.51681 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.3800E00 | 15.2510 | 0.0 | 0.0 | 1.43429 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.4000E00 | 15.2426 | 0.0 | 0.0 | 1.40305 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.5000E00 | 15.2018 | 0.0 | 0.0 | 1.26047 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.6000E00 | 15.1626 | 0.0 | 0.0 | 1.13756 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.7000E00 | 15.1248 | 0.0 | 0.0 | 1.03097 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.8000E00 | 15.0885 | 0.0 | 0.0 | 0.93801 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.9000E00 | 15.0534 | 0.0 | 0.0 | 0.85653 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.0000E00 | 15.0195 | 0.0 | 0.0 | 0.78475 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.2000E00 | 14.9549 | 0.0 | 0.0 | 0.66484 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.4000E00 | 14.8943 | 0.0 | 0.0 | 0.56949 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.6000E00 | 14.8372 | 0.0 | 0.0 | 0.49259 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.8000E00 | 14.7831 | 0.0 | 0.0 | 0.42980 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.0000E00 | 14.7318 | 0.0 | 0.0 | 0.37795 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.2000E00 | 14.6830 | 0.0 | 0.0 | 0.33470 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.4000E00 | 14.6365 | 0.0 | 0.0 | 0.29832 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.6000E00 | 14.5920 | 0.0 | 0.0 | 0.26746 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.8000E00 | 14.5495 | 0.0 | 0.0 | 0.24108 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|---------|---------|---------|---------|-----|-----|-------|---------|
| 5.0000E00 | 14.5087 | 5.74772 | 5.52932 | 5.70491 | 0.21839 | 0.0 | 0.0 | 0.0 | 0.21839 |
| 5.2000E00 | 14.4694 | 5.72282 | 5.52406 | 5.68305 | 0.19876 | 0.0 | 0.0 | 0.0 | 0.19876 |
| 5.4000E00 | 14.4317 | 5.70085 | 5.51919 | 5.65812 | 0.18167 | 0.0 | 0.0 | 0.0 | 0.18167 |
| 5.6000E00 | 14.3953 | 5.68137 | 5.51466 | 5.63868 | 0.16671 | 0.0 | 0.0 | 0.0 | 0.16671 |
| 5.8000E00 | 14.3602 | 5.66401 | 5.51044 | 5.62135 | 0.15357 | 0.0 | 0.0 | 0.0 | 0.15357 |
| 6.0000E00 | 14.3263 | 5.64846 | 5.50650 | 5.60582 | 0.14196 | 0.0 | 0.0 | 0.0 | 0.14196 |
| 6.2000E00 | 14.2935 | 5.63446 | 5.50279 | 5.59186 | 0.13167 | 0.0 | 0.0 | 0.0 | 0.13167 |
| 6.4000E00 | 14.2618 | 5.62182 | 5.49931 | 5.57925 | 0.12251 | 0.0 | 0.0 | 0.0 | 0.12251 |
| 7.0000E00 | 14.1722 | 5.59039 | 5.48996 | 5.54789 | 0.10043 | 0.0 | 0.0 | 0.0 | 0.10043 |
| 7.5000E00 | 14.1032 | 5.56985 | 5.48319 | 5.52740 | 0.08666 | 0.0 | 0.0 | 0.0 | 0.08666 |
| 8.0000E00 | 14.0387 | 5.55304 | 5.47715 | 5.51064 | 0.07589 | 0.0 | 0.0 | 0.0 | 0.07589 |
| 8.4000E00 | 13.9899 | 5.54166 | 5.47275 | 5.49929 | 0.06892 | 0.0 | 0.0 | 0.0 | 0.06892 |
| 9.0000E00 | 13.9209 | 5.52725 | 5.46670 | 5.48493 | 0.06055 | 0.0 | 0.0 | 0.0 | 0.06055 |
| 10.0000E00 | 13.8155 | 5.50680 | 5.45599 | 5.46456 | 0.05081 | 0.0 | 0.0 | 0.0 | 0.05081 |
| 10.4000E00 | 13.7763 | 5.50061 | 5.45271 | 5.45840 | 0.04791 | 0.0 | 0.0 | 0.0 | 0.04791 |
| 11.4000E00 | 13.6845 | 5.48759 | 5.44502 | 5.44543 | 0.04256 | 0.0 | 0.0 | 0.0 | 0.04256 |
| 12.4000E00 | 13.6004 | 5.47722 | 5.43781 | 5.43512 | 0.03940 | 0.0 | 0.0 | 0.0 | 0.03940 |
| 13.4000E00 | 13.5228 | 5.46887 | 5.43078 | 5.42682 | 0.03808 | 0.0 | 0.0 | 0.0 | 0.03808 |
| 13.9000E00 | 13.4862 | 5.46536 | 5.42724 | 5.42335 | 0.03812 | 0.0 | 0.0 | 0.0 | 0.03812 |
| 14.4000E00 | 13.4509 | 5.46234 | 5.42362 | 5.42035 | 0.03871 | 0.0 | 0.0 | 0.0 | 0.03871 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|------------|---------|-----|------|---------|---------|-----|-------|-----|------|
| 5.0000E00 | 14.5087 | 0.0 | 0.0 | 0.21839 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.2000E00 | 14.4694 | 0.0 | 0.0 | 0.19876 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.4000E00 | 14.4317 | 0.0 | 0.0 | 0.18167 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.6000E00 | 14.3953 | 0.0 | 0.0 | 0.16671 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.8000E00 | 14.3602 | 0.0 | 0.0 | 0.15357 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.0000E00 | 14.3263 | 0.0 | 0.0 | 0.14196 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.2000E00 | 14.2935 | 0.0 | 0.0 | 0.13167 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.4000E00 | 14.2618 | 0.0 | 0.0 | 0.12251 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.0000E00 | 14.1722 | 0.0 | 0.0 | 0.10043 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.5000E00 | 14.1032 | 0.0 | 0.0 | 0.08666 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.0000E00 | 14.0387 | 0.0 | 0.0 | 0.07589 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.4000E00 | 13.9899 | 0.0 | 0.0 | 0.06892 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9.0000E00 | 13.9209 | 0.0 | 0.0 | 0.06055 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.0000E00 | 13.8155 | 0.0 | 0.0 | 0.05081 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.4000E00 | 13.7763 | 0.0 | 0.0 | 0.04791 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11.4000E00 | 13.6845 | 0.0 | 0.0 | 0.04256 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12.4000E00 | 13.6004 | 0.0 | 0.0 | 0.03940 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 13.4000E00 | 13.5228 | 0.0 | 0.0 | 0.03808 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 13.9000E00 | 13.4862 | 0.0 | 0.0 | 0.03812 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 14.4000E00 | 13.4509 | 0.0 | 0.0 | 0.03871 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|---------|---------|---------|---------|-----|-----|-------|---------|
| 14.9000E00 | 13.4167 | 5.45988 | 5.41987 | 5.41792 | 0.04001 | 0.0 | 0.0 | 0.0 | 0.04001 |
| 15.4000E00 | 13.3837 | 5.45822 | 5.41589 | 5.41629 | 0.04232 | 0.0 | 0.0 | 0.0 | 0.04232 |
| 15.6500E00 | 13.3676 | 5.45783 | 5.41379 | 5.41592 | 0.04404 | 0.0 | 0.0 | 0.0 | 0.04404 |
| 15.9000E00 | 13.3518 | 5.45788 | 5.41157 | 5.41598 | 0.04631 | 0.0 | 0.0 | 0.0 | 0.04631 |
| 16.1500E00 | 13.3362 | 5.45856 | 5.40920 | 5.41669 | 0.04936 | 0.0 | 0.0 | 0.0 | 0.04936 |
| 16.4000E00 | 13.3208 | 5.46020 | 5.40664 | 5.41835 | 0.05356 | 0.0 | 0.0 | 0.0 | 0.05356 |
| 16.6000E00 | 13.3087 | 5.46258 | 5.40440 | 5.42074 | 0.05818 | 0.0 | 0.0 | 0.0 | 0.05818 |
| 16.8000E00 | 13.2967 | 5.46646 | 5.40194 | 5.42463 | 0.06452 | 0.0 | 0.0 | 0.0 | 0.06452 |
| 17.0000E00 | 13.2849 | 5.47276 | 5.39914 | 5.43096 | 0.07361 | 0.0 | 0.0 | 0.0 | 0.07361 |
| 17.2000E00 | 13.2732 | 5.48327 | 5.39588 | 5.44149 | 0.08739 | 0.0 | 0.0 | 0.0 | 0.08739 |
| 17.4000E00 | 13.2616 | 5.50174 | 5.39187 | 5.46000 | 0.10986 | 0.0 | 0.0 | 0.0 | 0.10986 |
| 17.5000E00 | 13.2559 | 5.51638 | 5.38945 | 5.47465 | 0.12693 | 0.0 | 0.0 | 0.0 | 0.12693 |
| 17.6000E00 | 13.2502 | 5.53722 | 5.38661 | 5.49551 | 0.15061 | 0.0 | 0.0 | 0.0 | 0.15061 |
| 17.7000E00 | 13.2445 | 5.56807 | 5.38318 | 5.52639 | 0.18489 | 0.0 | 0.0 | 0.0 | 0.18489 |
| 17.8000E00 | 13.2389 | 5.61616 | 5.37888 | 5.57451 | 0.23727 | 0.0 | 0.0 | 0.0 | 0.23727 |
| 17.9000E00 | 13.2333 | 5.69652 | 5.37324 | 5.65492 | 0.32328 | 0.0 | 0.0 | 0.0 | 0.32328 |
| 17.9500E00 | 13.2305 | 5.75836 | 5.36965 | 5.71679 | 0.38871 | 0.0 | 0.0 | 0.0 | 0.38871 |
| 18.0000E00 | 13.2277 | 5.84472 | 5.36532 | 5.80318 | 0.47940 | 0.0 | 0.0 | 0.0 | 0.47940 |
| 18.0500E00 | 13.2249 | 5.97015 | 5.35997 | 5.92865 | 0.61017 | 0.0 | 0.0 | 0.0 | 0.61017 |
| 18.1000E00 | 13.2222 | 6.16157 | 5.35317 | 6.12012 | 0.80840 | 0.0 | 0.0 | 0.0 | 0.80840 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|------------|---------|-----|------|---------|---------|-----|-------|-----|------|
| 14.9000E00 | 13.4167 | 0.0 | 0.0 | 0.04001 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.4000E00 | 13.3837 | 0.0 | 0.0 | 0.04232 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.6500E00 | 13.3676 | 0.0 | 0.0 | 0.04404 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.9000E00 | 13.3518 | 0.0 | 0.0 | 0.04631 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 16.1500E00 | 13.3362 | 0.0 | 0.0 | 0.04936 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 16.4000E00 | 13.3208 | 0.0 | 0.0 | 0.05356 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 16.6000E00 | 13.3087 | 0.0 | 0.0 | 0.05818 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 16.8000E00 | 13.2967 | 0.0 | 0.0 | 0.06452 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.0000E00 | 13.2849 | 0.0 | 0.0 | 0.07361 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.2000E00 | 13.2732 | 0.0 | 0.0 | 0.08739 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.4000E00 | 13.2616 | 0.0 | 0.0 | 0.10986 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.5000E00 | 13.2559 | 0.0 | 0.0 | 0.12693 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.6000E00 | 13.2502 | 0.0 | 0.0 | 0.15061 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.7000E00 | 13.2445 | 0.0 | 0.0 | 0.18489 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.8000E00 | 13.2389 | 0.0 | 0.0 | 0.23727 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.9000E00 | 13.2333 | 0.0 | 0.0 | 0.32328 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17.9500E00 | 13.2305 | 0.0 | 0.0 | 0.38871 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.0000E00 | 13.2277 | 0.0 | 0.0 | 0.47940 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.0500E00 | 13.2249 | 0.0 | 0.0 | 0.61017 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.1000E00 | 13.2222 | 0.0 | 0.0 | 0.80840 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|----------|---------|----------|----------|-----|-----|-------|----------|
| 18.1500E00 | 13.2194 | 6.47317 | 5.34421 | 6.43179 | 1.12895 | 0.0 | 0.0 | 0.0 | 1.12895 |
| 18.2000E00 | 13.2167 | 7.02617 | 5.33197 | 6.98489 | 1.69420 | 0.0 | 0.0 | 0.0 | 1.69420 |
| 18.2300E00 | 13.2150 | 7.58687 | 5.32235 | 7.54566 | 2.26451 | 0.0 | 0.0 | 0.0 | 2.26451 |
| 18.2600E00 | 13.2134 | 8.47987 | 5.31054 | 8.43876 | 3.16933 | 0.0 | 0.0 | 0.0 | 3.16933 |
| 18.2800E00 | 13.2123 | 9.39301 | 5.30142 | 9.35196 | 4.09159 | 0.0 | 0.0 | 0.0 | 4.09159 |
| 18.3000E00 | 13.2112 | 10.73067 | 5.29178 | 10.68970 | 5.43889 | 0.0 | 0.0 | 0.0 | 5.43889 |
| 18.3200E00 | 13.2101 | 12.74205 | 5.28327 | 12.70114 | 7.45877 | 0.0 | 0.0 | 0.0 | 7.45877 |
| 18.3400E00 | 13.2090 | 15.78709 | 5.28065 | 15.74621 | 10.50645 | 0.0 | 0.0 | 0.0 | 10.50645 |
| 18.3500E00 | 13.2085 | 17.80655 | 5.28476 | 17.76563 | 12.52178 | 0.0 | 0.0 | 0.0 | 12.52178 |
| 18.3600E00 | 13.2079 | 20.15200 | 5.29542 | 20.11100 | 14.85658 | 0.0 | 0.0 | 0.0 | 14.85658 |
| 18.3700E00 | 13.2074 | 22.69497 | 5.31534 | 22.65381 | 17.37962 | 0.0 | 0.0 | 0.0 | 17.37962 |
| 18.3800E00 | 13.2068 | 25.12710 | 5.34661 | 25.08571 | 19.78050 | 0.0 | 0.0 | 0.0 | 19.78050 |
| 18.3900E00 | 13.2063 | 26.95626 | 5.38867 | 26.91454 | 21.56759 | 0.0 | 0.0 | 0.0 | 21.56759 |
| 18.4000E00 | 13.2057 | 27.67035 | 5.43666 | 27.62826 | 22.23369 | 0.0 | 0.0 | 0.0 | 22.23369 |
| 18.4100E00 | 13.2052 | 27.03839 | 5.48240 | 26.99594 | 21.55599 | 0.0 | 0.0 | 0.0 | 21.55599 |
| 18.4200E00 | 13.2047 | 25.27766 | 5.51843 | 25.23494 | 19.75924 | 0.0 | 0.0 | 0.0 | 19.75924 |
| 18.4300E00 | 13.2041 | 22.89326 | 5.54161 | 22.85035 | 17.35165 | 0.0 | 0.0 | 0.0 | 17.35165 |
| 18.4400E00 | 13.2036 | 20.37781 | 5.55304 | 20.33482 | 14.82477 | 0.0 | 0.0 | 0.0 | 14.82477 |
| 18.4500E00 | 13.2030 | 18.04421 | 5.55584 | 18.00120 | 12.48838 | 0.0 | 0.0 | 0.0 | 12.48838 |
| 18.4600E00 | 13.2025 | 16.02610 | 5.55318 | 15.98311 | 10.47293 | 0.0 | 0.0 | 0.0 | 10.47293 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|------------|---------|-----|------|----------|---------|-----|-------|-----|------|
| 18.1500E00 | 13.2194 | 0.0 | 0.0 | 1.12895 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.2000E00 | 13.2167 | 0.0 | 0.0 | 1.69420 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.2300E00 | 13.2150 | 0.0 | 0.0 | 2.26451 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.2600E00 | 13.2134 | 0.0 | 0.0 | 3.16933 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.2800E00 | 13.2123 | 0.0 | 0.0 | 4.09159 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3000E00 | 13.2112 | 0.0 | 0.0 | 5.43889 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3200E00 | 13.2101 | 0.0 | 0.0 | 7.45877 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3400E00 | 13.2090 | 0.0 | 0.0 | 10.50645 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3500E00 | 13.2085 | 0.0 | 0.0 | 12.52178 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3600E00 | 13.2079 | 0.0 | 0.0 | 14.85658 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3700E00 | 13.2074 | 0.0 | 0.0 | 17.37962 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3800E00 | 13.2068 | 0.0 | 0.0 | 19.78050 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.3900E00 | 13.2063 | 0.0 | 0.0 | 21.56759 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4000E00 | 13.2057 | 0.0 | 0.0 | 22.23369 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4100E00 | 13.2052 | 0.0 | 0.0 | 21.55599 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4200E00 | 13.2047 | 0.0 | 0.0 | 19.75924 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4300E00 | 13.2041 | 0.0 | 0.0 | 17.35165 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4400E00 | 13.2036 | 0.0 | 0.0 | 14.82477 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4500E00 | 13.2030 | 0.0 | 0.0 | 12.48838 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.4600E00 | 13.2025 | 0.0 | 0.0 | 10.47293 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|----------|---------|----------|---------|-----|-----|-------|---------|
| 18.4800E00 | 13.2014 | 12.96763 | 5.54030 | 12.92474 | 7.42733 | 0.0 | 0.0 | 0.0 | 7.42733 |
| 18.5000E00 | 13.2003 | 10.93556 | 5.52501 | 10.89278 | 5.41055 | 0.0 | 0.0 | 0.0 | 5.41055 |
| 18.5200E00 | 13.1992 | 9.57720 | 5.51084 | 9.53453 | 4.06636 | 0.0 | 0.0 | 0.0 | 4.06636 |
| 18.5400E00 | 13.1982 | 8.64552 | 5.49861 | 8.60295 | 3.14690 | 0.0 | 0.0 | 0.0 | 3.14690 |
| 18.5700E00 | 13.1965 | 7.72938 | 5.48375 | 7.68692 | 2.24562 | 0.0 | 0.0 | 0.0 | 2.24562 |
| 18.6000E00 | 13.1949 | 7.15037 | 5.47221 | 7.10801 | 1.67816 | 0.0 | 0.0 | 0.0 | 1.67816 |
| 18.6500E00 | 13.1922 | 6.57461 | 5.45805 | 6.53236 | 1.11656 | 0.0 | 0.0 | 0.0 | 1.11656 |
| 18.7000E00 | 13.1896 | 6.24673 | 5.44799 | 6.20455 | 0.79874 | 0.0 | 0.0 | 0.0 | 0.79874 |
| 18.7500E00 | 13.1869 | 6.04314 | 5.44049 | 6.00102 | 0.60265 | 0.0 | 0.0 | 0.0 | 0.60265 |
| 18.8000E00 | 13.1842 | 5.90829 | 5.43466 | 5.86622 | 0.47363 | 0.0 | 0.0 | 0.0 | 0.47363 |
| 18.8500E00 | 13.1816 | 5.81441 | 5.42998 | 5.77237 | 0.38443 | 0.0 | 0.0 | 0.0 | 0.38443 |
| 18.9000E00 | 13.1789 | 5.74642 | 5.42613 | 5.70441 | 0.32029 | 0.0 | 0.0 | 0.0 | 0.32029 |
| 19.0000E00 | 13.1737 | 5.65656 | 5.42008 | 5.61460 | 0.23648 | 0.0 | 0.0 | 0.0 | 0.23648 |
| 19.1000E00 | 13.1684 | 5.60142 | 5.41547 | 5.55949 | 0.18595 | 0.0 | 0.0 | 0.0 | 0.18595 |
| 19.2000E00 | 13.1632 | 5.56508 | 5.41177 | 5.52318 | 0.15331 | 0.0 | 0.0 | 0.0 | 0.15331 |
| 19.3000E00 | 13.1580 | 5.53979 | 5.40867 | 5.49792 | 0.13113 | 0.0 | 0.0 | 0.0 | 0.13113 |
| 19.4000E00 | 13.1528 | 5.52145 | 5.40598 | 5.47960 | 0.11547 | 0.0 | 0.0 | 0.0 | 0.11547 |
| 19.6000E00 | 13.1426 | 5.49708 | 5.40142 | 5.45526 | 0.09566 | 0.0 | 0.0 | 0.0 | 0.09566 |
| 19.8000E00 | 13.1324 | 5.48197 | 5.39753 | 5.44018 | 0.08444 | 0.0 | 0.0 | 0.0 | 0.08444 |
| 20.0000E00 | 13.1224 | 5.47191 | 5.39404 | 5.43015 | 0.07787 | 0.0 | 0.0 | 0.0 | 0.07787 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|------------|---------|-----|------|---------|---------|-----|-------|-----|------|
| 18.4800E00 | 13.2014 | 0.0 | 0.0 | 7.42733 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.5000E00 | 13.2003 | 0.0 | 0.0 | 5.41055 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.5200E00 | 13.1992 | 0.0 | 0.0 | 4.06636 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.5400E00 | 13.1982 | 0.0 | 0.0 | 3.14690 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.5700E00 | 13.1965 | 0.0 | 0.0 | 2.24562 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.6000E00 | 13.1949 | 0.0 | 0.0 | 1.67816 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.6500E00 | 13.1922 | 0.0 | 0.0 | 1.11656 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.7000E00 | 13.1896 | 0.0 | 0.0 | 0.79874 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.7500E00 | 13.1869 | 0.0 | 0.0 | 0.60265 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.8000E00 | 13.1842 | 0.0 | 0.0 | 0.47363 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.8500E00 | 13.1816 | 0.0 | 0.0 | 0.38443 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18.9000E00 | 13.1789 | 0.0 | 0.0 | 0.32029 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.0000E00 | 13.1737 | 0.0 | 0.0 | 0.23648 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.1000E00 | 13.1684 | 0.0 | 0.0 | 0.18595 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.2000E00 | 13.1632 | 0.0 | 0.0 | 0.15331 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.3000E00 | 13.1580 | 0.0 | 0.0 | 0.13113 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.4000E00 | 13.1528 | 0.0 | 0.0 | 0.11547 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.6000E00 | 13.1426 | 0.0 | 0.0 | 0.09566 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19.8000E00 | 13.1324 | 0.0 | 0.0 | 0.08444 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 20.0000E00 | 13.1224 | 0.0 | 0.0 | 0.07787 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|--------|----------|----------|----------|---------|-----|-----|-------|---------|
| 1.1300E 3 | 9.0881 | 17.31569 | 16.07137 | 17.19126 | 1.24431 | 0.0 | 0.0 | 0.0 | 1.24431 |
| 2.0000E 3 | 8.5172 | 6.35000 | 4.75000 | 6.31323 | 1.60000 | 0.0 | 0.0 | 0.0 | 1.60000 |
| 3.0000E 3 | 8.1117 | 6.40000 | 5.00000 | 6.36129 | 1.40000 | 0.0 | 0.0 | 0.0 | 1.40000 |
| 4.0000E 3 | 7.8240 | 6.45000 | 5.15000 | 6.41013 | 1.30000 | 0.0 | 0.0 | 0.0 | 1.30000 |
| 5.0000E 3 | 7.6009 | 6.50000 | 5.30000 | 6.45897 | 1.20000 | 0.0 | 0.0 | 0.0 | 1.20000 |
| 6.0000E 3 | 7.4186 | 6.55000 | 5.45000 | 6.50781 | 1.10000 | 0.0 | 0.0 | 0.0 | 1.10000 |
| 7.0000E 3 | 7.2644 | 6.60000 | 5.58000 | 6.55680 | 1.02000 | 0.0 | 0.0 | 0.0 | 1.02000 |
| 8.0000E 3 | 7.1309 | 6.65000 | 5.71000 | 6.60579 | 0.94000 | 0.0 | 0.0 | 0.0 | 0.94000 |
| 9.0000E 3 | 7.0131 | 6.70000 | 5.84000 | 6.65479 | 0.86000 | 0.0 | 0.0 | 0.0 | 0.86000 |
| 10.0000E 3 | 6.9078 | 6.70000 | 5.91000 | 6.65424 | 0.79000 | 0.0 | 0.0 | 0.0 | 0.79000 |
| 15.0000E 3 | 6.5023 | 6.75000 | 6.19000 | 6.70208 | 0.56000 | 0.0 | 0.0 | 0.0 | 0.56000 |
| 20.0000E 3 | 6.2146 | 6.75000 | 6.31000 | 6.70115 | 0.44000 | 0.0 | 0.0 | 0.0 | 0.44000 |
| 25.0000E 3 | 5.9915 | 6.80000 | 6.44000 | 6.75014 | 0.36000 | 0.0 | 0.0 | 0.0 | 0.36000 |
| 30.0000E 3 | 5.8091 | 6.85000 | 6.52000 | 6.79952 | 0.33000 | 0.0 | 0.0 | 0.0 | 0.33000 |
| 40.0000E 3 | 5.5215 | 6.90000 | 6.64000 | 6.84859 | 0.26000 | 0.0 | 0.0 | 0.0 | 0.26000 |
| 50.0000E 3 | 5.2983 | 6.95000 | 6.72500 | 6.89794 | 0.22500 | 0.0 | 0.0 | 0.0 | 0.22500 |
| 60.0000E 3 | 5.1160 | 7.00000 | 6.80000 | 6.94735 | 0.20000 | 0.0 | 0.0 | 0.0 | 0.20000 |
| 70.0000E 3 | 4.9618 | 7.05000 | 6.87000 | 6.99681 | 0.18000 | 0.0 | 0.0 | 0.0 | 0.18000 |
| 80.0000E 3 | 4.8283 | 7.10000 | 6.93000 | 7.04635 | 0.17000 | 0.0 | 0.0 | 0.0 | 0.17000 |
| 90.0000E 3 | 4.7105 | 7.15000 | 6.99000 | 7.09588 | 0.16000 | 0.0 | 0.0 | 0.0 | 0.16000 |

| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
|------------|--------|-----|------|---------|---------|-----|-------|-----|------|
| 1.1300E 3 | 9.0881 | 0.0 | 0.0 | 1.24431 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.0000E 3 | 8.5172 | 0.0 | 0.0 | 1.60000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.0000E 3 | 8.1117 | 0.0 | 0.0 | 1.40000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.0000E 3 | 7.8240 | 0.0 | 0.0 | 1.30000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.0000E 3 | 7.6009 | 0.0 | 0.0 | 1.20000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.0000E 3 | 7.4186 | 0.0 | 0.0 | 1.10000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.0000E 3 | 7.2644 | 0.0 | 0.0 | 1.02000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.0000E 3 | 7.1309 | 0.0 | 0.0 | 0.94000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9.0000E 3 | 7.0131 | 0.0 | 0.0 | 0.86000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.0000E 3 | 6.9078 | 0.0 | 0.0 | 0.79000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.0000E 3 | 6.5023 | 0.0 | 0.0 | 0.56000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 20.0000E 3 | 6.2146 | 0.0 | 0.0 | 0.44000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 25.0000E 3 | 5.9915 | 0.0 | 0.0 | 0.36000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 30.0000E 3 | 5.8091 | 0.0 | 0.0 | 0.33000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 40.0000E 3 | 5.5215 | 0.0 | 0.0 | 0.26000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 50.0000E 3 | 5.2983 | 0.0 | 0.0 | 0.22500 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 60.0000E 3 | 5.1160 | 0.0 | 0.0 | 0.20000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70.0000E 3 | 4.9618 | 0.0 | 0.0 | 0.18000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80.0000E 3 | 4.8283 | 0.0 | 0.0 | 0.17000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90.0000E 3 | 4.7105 | 0.0 | 0.0 | 0.16000 | 0.00774 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|--------|---------|---------|---------|---------|-----|-------|-------|---------|
| 100.0000E 3 | 4.6052 | 7.20000 | 7.05000 | 7.10130 | 0.15000 | 0.0 | 0.0 | 0.0 | 0.15000 |
| 120.0000E 3 | 4.4228 | 7.22000 | 7.08200 | 6.68177 | 0.13800 | 0.0 | 0.0 | 0.0 | 0.13800 |
| 140.0000E 3 | 4.2687 | 7.23000 | 7.10000 | 6.38510 | 0.13000 | 0.0 | 0.0 | 0.0 | 0.13000 |
| 160.0000E 3 | 4.1352 | 7.24000 | 7.11600 | 6.15125 | 0.12400 | 0.0 | 0.0 | 0.0 | 0.12400 |
| 180.0000E 3 | 4.0174 | 7.25000 | 7.13200 | 5.93771 | 0.11800 | 0.0 | 0.0 | 0.0 | 0.11800 |
| 200.0000E 3 | 3.9120 | 7.26000 | 7.14500 | 5.75241 | 0.11500 | 0.0 | 0.0 | 0.0 | 0.11500 |
| 220.0000E 3 | 3.8167 | 7.27000 | 7.15800 | 5.58787 | 0.11200 | 0.0 | 0.0 | 0.0 | 0.11200 |
| 240.0000E 3 | 3.7297 | 7.28000 | 7.17200 | 5.44397 | 0.10800 | 0.0 | 0.0 | 0.0 | 0.10800 |
| 260.0000E 3 | 3.6497 | 7.27000 | 7.16300 | 5.30734 | 0.10700 | 0.0 | 0.0 | 0.0 | 0.10700 |
| 280.0000E 3 | 3.5756 | 7.26000 | 7.15400 | 5.18534 | 0.10600 | 0.0 | 0.0 | 0.0 | 0.10600 |
| 300.0000E 3 | 3.5066 | 7.25000 | 7.14500 | 5.07792 | 0.10500 | 0.0 | 0.0 | 0.0 | 0.10500 |
| 350.0000E 3 | 3.3524 | 7.25000 | 7.10100 | 4.91377 | 0.10200 | 0.0 | 0.0 | 0.0 | 0.10200 |
| 400.0000E 3 | 3.2189 | 7.25000 | 7.05100 | 4.79625 | 0.10000 | 0.0 | 0.0 | 0.0 | 0.10000 |
| 450.0000E 3 | 3.1011 | 7.25000 | 7.02000 | 4.69472 | 0.09800 | 0.0 | 0.0 | 0.0 | 0.09800 |
| 500.0000E 3 | 2.9957 | 7.20000 | 6.93000 | 4.58739 | 0.09500 | 0.0 | 0.0 | 0.0 | 0.09500 |
| 550.0000E 3 | 2.9004 | 7.05000 | 6.73900 | 4.42853 | 0.09100 | 0.0 | 0.0 | 0.0 | 0.09100 |
| 600.0000E 3 | 2.8134 | 6.95000 | 6.59800 | 4.31080 | 0.08800 | 0.0 | 0.0 | 0.0 | 0.08800 |
| 650.0000E 3 | 2.7334 | 6.85000 | 6.34100 | 4.26287 | 0.08400 | 0.0 | 0.0 | 0.0 | 0.08400 |
| 700.0000E 3 | 2.6593 | 6.80000 | 6.12000 | 4.24184 | 0.08000 | 0.0 | 0.0 | 0.0 | 0.08000 |
| 750.0000E 3 | 2.5903 | 6.75000 | 5.93400 | 4.22212 | 0.07600 | 0.0 | 0.0 | 0.0 | 0.07600 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 100.0000E 3 | 4.6052 | 0.0 | 0.0 | 0.15000 | 0.01400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 120.0000E 3 | 4.4228 | 0.0 | 0.0 | 0.13800 | 0.07600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 140.0000E 3 | 4.2687 | 0.0 | 0.0 | 0.13000 | 0.11900 | 0.0 | 0.0 | 0.0 | 0.0 |
| 160.0000E 3 | 4.1352 | 0.0 | 0.0 | 0.12400 | 0.15300 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180.0000E 3 | 4.0174 | 0.0 | 0.0 | 0.11800 | 0.18400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 200.0000E 3 | 3.9120 | 0.0 | 0.0 | 0.11500 | 0.21100 | 0.0 | 0.0 | 0.0 | 0.0 |
| 220.0000E 3 | 3.8167 | 0.0 | 0.0 | 0.11200 | 0.23500 | 0.0 | 0.0 | 0.0 | 0.0 |
| 240.0000E 3 | 3.7297 | 0.0 | 0.0 | 0.10800 | 0.25600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 260.0000E 3 | 3.6497 | 0.0 | 0.0 | 0.10700 | 0.27400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 280.0000E 3 | 3.5756 | 0.0 | 0.0 | 0.10600 | 0.29000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 300.0000E 3 | 3.5066 | 0.0 | 0.0 | 0.10500 | 0.30400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 350.0000E 3 | 3.3524 | 0.04700 | 0.0 | 0.14900 | 0.32900 | 0.0 | 0.0 | 0.0 | 0.0 |
| 400.0000E 3 | 3.2189 | 0.09900 | 0.0 | 0.19900 | 0.34800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 450.0000E 3 | 3.1011 | 0.13200 | 0.0 | 0.23000 | 0.36400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 500.0000E 3 | 2.9957 | 0.17500 | 0.0 | 0.27000 | 0.37700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 550.0000E 3 | 2.9004 | 0.22000 | 0.0 | 0.31100 | 0.38900 | 0.0 | 0.0 | 0.0 | 0.0 |
| 600.0000E 3 | 2.8134 | 0.26400 | 0.0 | 0.35200 | 0.40000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 650.0000E 3 | 2.7334 | 0.42500 | 0.0 | 0.50900 | 0.40800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 700.0000E 3 | 2.6593 | 0.60000 | 0.0 | 0.68000 | 0.41800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 750.0000E 3 | 2.5903 | 0.74000 | 0.0 | 0.81600 | 0.42600 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|-------------|--------|---------|---------|---------|---------|-----|---------|-------|---------|
| 800.0000E 3 | 2.5257 | 6.70000 | 5.79700 | 4.18990 | 0.07300 | 0.0 | 0.0 | 0.0 | 0.07300 |
| 850.0000E 3 | 2.4651 | 6.65000 | 5.68100 | 4.15036 | 0.06900 | 0.0 | 0.0 | 0.0 | 0.06900 |
| 900.0000E 3 | 2.4079 | 6.60000 | 5.57600 | 4.09638 | 0.06400 | 0.0 | 0.0 | 0.0 | 0.06400 |
| 950.0000E 3 | 2.3539 | 6.55000 | 5.46900 | 4.05614 | 0.06100 | 0.0 | 0.0 | 0.0 | 0.06100 |
| 1.0000E 6 | 2.3026 | 6.50000 | 5.37250 | 4.00716 | 0.05750 | 0.0 | 0.0 | 0.0 | 0.05750 |
| 1.2000E 6 | 2.1203 | 6.09000 | 4.94400 | 3.62789 | 0.04800 | 0.0 | 0.0 | 0.0 | 0.04800 |
| 1.3000E 6 | 2.0402 | 5.95000 | 4.80000 | 3.47320 | 0.04400 | 0.0 | 0.0 | 0.0 | 0.04400 |
| 1.4000E 6 | 1.9661 | 5.80000 | 4.56600 | 3.36176 | 0.04000 | 0.0 | 0.0 | 0.0 | 0.04000 |
| 1.6000E 6 | 1.8326 | 5.78000 | 4.21600 | 3.41061 | 0.03400 | 0.0 | 0.0 | 0.0 | 0.03400 |
| 1.8000E 6 | 1.7148 | 5.55000 | 3.89050 | 3.30907 | 0.02950 | 0.0 | 0.0 | 0.0 | 0.02950 |
| 2.0000E 6 | 1.6094 | 5.35000 | 3.60400 | 3.23806 | 0.02600 | 0.0 | 0.0 | 0.0 | 0.02600 |
| 2.2000E 6 | 1.5141 | 5.30000 | 3.49700 | 3.22978 | 0.02300 | 0.0 | 0.0 | 0.0 | 0.02300 |
| 2.4000E 6 | 1.4271 | 5.00000 | 3.13950 | 3.12886 | 0.02050 | 0.0 | 0.0 | 0.0 | 0.02050 |
| 2.6000E 6 | 1.3471 | 4.77000 | 2.86100 | 3.05912 | 0.01900 | 0.0 | 0.0 | 0.0 | 0.01900 |
| 2.8000E 6 | 1.2730 | 4.63000 | 2.67300 | 3.02353 | 0.01700 | 0.0 | 0.0 | 0.0 | 0.01700 |
| 3.0000E 6 | 1.2040 | 4.48000 | 2.50350 | 2.97039 | 0.01550 | 0.0 | 0.0 | 0.0 | 0.01550 |
| 3.5000E 6 | 1.0498 | 4.22000 | 2.17700 | 2.90292 | 0.01300 | 0.0 | 0.0 | 0.0 | 0.01300 |
| 4.0000E 6 | 0.9163 | 4.08000 | 1.99890 | 2.86667 | 0.01100 | 0.0 | 0.00010 | 0.0 | 0.01110 |
| 4.5000E 6 | 0.7985 | 4.02000 | 1.90040 | 2.86646 | 0.00950 | 0.0 | 0.00010 | 0.0 | 0.00960 |
| 5.0000E 6 | 0.6931 | 4.00000 | 1.87040 | 2.85906 | 0.00840 | 0.0 | 0.00020 | 0.0 | 0.00860 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 800.0000E 3 | 2.5257 | 0.83000 | 0.0 | 0.90300 | 0.43300 | 0.0 | 0.0 | 0.0 | 0.0 |
| 850.0000E 3 | 2.4651 | 0.90000 | 0.0 | 0.96900 | 0.44000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 900.0000E 3 | 2.4079 | 0.96000 | 0.0 | 1.02400 | 0.44900 | 0.0 | 0.0 | 0.0 | 0.0 |
| 950.0000E 3 | 2.3539 | 1.02000 | 0.0 | 1.08100 | 0.45600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.0000E 6 | 2.3026 | 1.07000 | 0.0 | 1.12750 | 0.46400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.2000E 6 | 2.1203 | 1.09800 | 0.0 | 1.14600 | 0.49800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.3000E 6 | 2.0402 | 1.10600 | 0.0 | 1.15000 | 0.51600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.4000E 6 | 1.9661 | 1.19400 | 0.0 | 1.23400 | 0.53400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.6000E 6 | 1.8326 | 1.53000 | 0.0 | 1.56400 | 0.56200 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1.8000E 6 | 1.7148 | 1.63000 | 0.0 | 1.65950 | 0.57600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.0000E 6 | 1.6094 | 1.72000 | 0.0 | 1.74600 | 0.58600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.2000E 6 | 1.5141 | 1.78000 | 0.0 | 1.80300 | 0.59200 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.4000E 6 | 1.4271 | 1.84000 | 0.0 | 1.86050 | 0.59600 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.6000E 6 | 1.3471 | 1.89000 | 0.0 | 1.90900 | 0.59800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2.8000E 6 | 1.2730 | 1.94000 | 0.0 | 1.95700 | 0.60100 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.0000E 6 | 1.2040 | 1.96100 | 0.0 | 1.97650 | 0.60300 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3.5000E 6 | 1.0498 | 2.03000 | 0.0 | 2.04300 | 0.60500 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.0000E 6 | 0.9163 | 2.07000 | 0.0 | 2.08110 | 0.60700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4.5000E 6 | 0.7985 | 2.11000 | 0.0 | 2.11960 | 0.60700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5.0000E 6 | 0.6931 | 2.12100 | 0.0 | 2.12960 | 0.61000 | 0.0 | 0.0 | 0.0 | 0.0 |

MATERIAL CD

| E | U | SGT | SGN | SGTR | SGG | SGF | SGP | SGALP | SGA |
|------------|---------|---------|---------|---------|---------|-----|---------|---------|---------|
| 5.5000E 6 | 0.5978 | 4.00000 | 1.87020 | 2.85170 | 0.00750 | 0.0 | 0.00030 | 0.0 | 0.00780 |
| 6.0000E 6 | 0.5108 | 4.01000 | 1.90070 | 2.82396 | 0.00680 | 0.0 | 0.00050 | 0.0 | 0.00730 |
| 6.5000E 6 | 0.4308 | 4.03000 | 1.94000 | 2.79422 | 0.00630 | 0.0 | 0.00070 | 0.0 | 0.00700 |
| 7.0000E 6 | 0.3567 | 4.08000 | 2.00020 | 2.77787 | 0.00570 | 0.0 | 0.00100 | 0.00010 | 0.00680 |
| 7.5000E 6 | 0.2877 | 4.11000 | 2.05030 | 2.74655 | 0.00530 | 0.0 | 0.00130 | 0.00010 | 0.00670 |
| 8.0000E 6 | 0.2231 | 4.18000 | 2.13030 | 2.72501 | 0.00490 | 0.0 | 0.00170 | 0.00010 | 0.00670 |
| 8.5000E 6 | 0.1625 | 4.22000 | 2.18020 | 2.68514 | 0.00450 | 0.0 | 0.00210 | 0.00020 | 0.00680 |
| 9.0000E 6 | 0.1054 | 4.27000 | 2.23980 | 2.65510 | 0.00420 | 0.0 | 0.00280 | 0.00020 | 0.00720 |
| 9.5000E 6 | 0.0513 | 4.32000 | 2.30030 | 2.62238 | 0.00390 | 0.0 | 0.00350 | 0.00030 | 0.00770 |
| 10.0000E 6 | 0.0000 | 4.36000 | 2.34960 | 2.57430 | 0.00360 | 0.0 | 0.00440 | 0.00040 | 0.00840 |
| 10.5000E 6 | -0.0488 | 4.41000 | 2.40480 | 2.53426 | 0.00340 | 0.0 | 0.00530 | 0.00050 | 0.00920 |
| 11.0000E 6 | -0.0953 | 4.47000 | 2.46960 | 2.50173 | 0.00320 | 0.0 | 0.00650 | 0.00070 | 0.01040 |
| 11.5000E 6 | -0.1398 | 4.52000 | 2.52520 | 2.46701 | 0.00300 | 0.0 | 0.00790 | 0.00090 | 0.01180 |
| 12.0000E 6 | -0.1823 | 4.54000 | 2.54950 | 2.42646 | 0.00280 | 0.0 | 0.00950 | 0.00120 | 0.01350 |
| 12.5000E 6 | -0.2231 | 4.56000 | 2.57450 | 2.39742 | 0.00270 | 0.0 | 0.01130 | 0.00150 | 0.01550 |
| 13.0000E 6 | -0.2624 | 4.58000 | 2.60020 | 2.36723 | 0.00250 | 0.0 | 0.01350 | 0.00180 | 0.01780 |
| 13.5000E 6 | -0.3001 | 4.60000 | 2.62450 | 2.33768 | 0.00240 | 0.0 | 0.01590 | 0.00220 | 0.02050 |
| 14.0000E 6 | -0.3365 | 4.62000 | 2.64950 | 2.32023 | 0.00230 | 0.0 | 0.01860 | 0.00260 | 0.02350 |
| 14.5000E 6 | -0.3716 | 4.60000 | 2.63530 | 2.28884 | 0.00220 | 0.0 | 0.02140 | 0.00310 | 0.02670 |
| 15.0000E 6 | -0.4055 | 4.55000 | 2.58950 | 2.25829 | 0.00210 | 0.0 | 0.02480 | 0.00360 | 0.03050 |
| E | U | SGI | SG2N | SGX | MUEL | NUE | ALPHA | ETA | CHIF |
| 5.5000E 6 | 0.5978 | 2.12200 | 0.0 | 2.12980 | 0.61400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.0000E 6 | 0.5108 | 2.10200 | 0.0 | 2.10930 | 0.62400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6.5000E 6 | 0.4308 | 2.08300 | 0.0 | 2.09000 | 0.63700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.0000E 6 | 0.3567 | 2.07300 | 0.0 | 2.07980 | 0.65100 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7.5000E 6 | 0.2877 | 2.05300 | 0.0 | 2.05970 | 0.66500 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.0000E 6 | 0.2231 | 2.03400 | 0.00900 | 2.04970 | 0.68300 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8.5000E 6 | 0.1625 | 1.99800 | 0.03500 | 2.03980 | 0.70400 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9.0000E 6 | 0.1054 | 1.95300 | 0.07000 | 2.03020 | 0.72100 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9.5000E 6 | 0.0513 | 1.87900 | 0.13300 | 2.01970 | 0.73800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.0000E 6 | 0.0000 | 1.71700 | 0.28500 | 2.01040 | 0.76000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10.5000E 6 | -0.0488 | 1.48400 | 0.51200 | 2.00520 | 0.78000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11.0000E 6 | -0.0953 | 1.23900 | 0.75100 | 2.00040 | 0.79700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11.5000E 6 | -0.1398 | 0.99600 | 0.98700 | 1.99480 | 0.81300 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12.0000E 6 | -0.1823 | 0.79500 | 1.18200 | 1.99050 | 0.82900 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12.5000E 6 | -0.2231 | 0.63400 | 1.33600 | 1.98550 | 0.84000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 13.0000E 6 | -0.2624 | 0.51500 | 1.44700 | 1.97980 | 0.85100 | 0.0 | 0.0 | 0.0 | 0.0 |
| 13.5000E 6 | -0.3001 | 0.42300 | 1.53200 | 1.97550 | 0.86200 | 0.0 | 0.0 | 0.0 | 0.0 |
| 14.0000E 6 | -0.3365 | 0.36600 | 1.58100 | 1.97050 | 0.86800 | 0.0 | 0.0 | 0.0 | 0.0 |
| 14.5000E 6 | -0.3716 | 0.32500 | 1.61300 | 1.96470 | 0.87700 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15.0000E 6 | -0.4055 | 0.29700 | 1.63300 | 1.96050 | 0.88500 | 0.0 | 0.0 | 0.0 | 0.0 |

Table 3

Inelastic excitation cross sections for Cd

| E (MeV) | $\sigma_{n'}^{0.3}(b)$ | $\sigma_{n'}^{0.6}(b)$ | $\sigma_{n'}^{1.2}(b)$ | $\sigma_{n'}^{1.3}(b)$ |
|---------|------------------------|------------------------|------------------------|------------------------|
| 0.30 | 0.0 | | | |
| 0.35 | 0.047 | | | |
| 0.40 | 0.099 | | | |
| 0.45 | 0.132 | | | |
| 0.50 | 0.175 | | | |
| 0.55 | 0.220 | | | |
| 0.60 | 0.264 | 0.0 | | |
| 0.65 | 0.296 | 0.129 | | |
| 0.70 | 0.310 | 0.290 | | |
| 0.75 | 0.312 | 0.428 | | |
| 0.80 | 0.297 | 0.533 | | |
| 0.85 | 0.273 | 0.627 | | |
| 0.90 | 0.246 | 0.714 | | |
| 0.95 | 0.224 | 0.796 | | |
| 1.00 | 0.200 | 0.870 | | |
| 1.20 | 0.158 | 0.940 | 0.0 | |
| 1.30 | 0.146 | 0.868 | 0.092 | 0.0 |
| 1.40 | 0.135 | 0.760 | 0.173 | 0.126 |

Table 4

26 group cross sections for Cd (Na P1 - weighting spectrum)

| Energy group | ΔE | σ_a (b) | σ_n (b) | $\sigma_{n'}$ (b) | $\bar{\mu}_L$ | σ_{er} (b) | σ_{tr} (b) |
|--------------|--------------|----------------|----------------|-------------------|---------------|-------------------|-------------------|
| 1 | 6.5-10.5MeV | 0.007 | 2.090 | 2.014 | 0.7038 | 0.052 | 2.729 |
| 2 | 4.0- 6.5 | 0.009 | 1.913 | 2.103 | 0.6154 | 0.049 | 2.856 |
| 3 | 2.5- 4.0 | 0.015 | 2.481 | 1.970 | 0.6034 | 0.058 | 2.972 |
| 4 | 1.4- 2.5 | 0.030 | 3.892 | 1.595 | 0.5780 | 0.082 | 3.300 |
| 5 | 0.8- 1.4 | 0.057 | 5.276 | 1.032 | 0.4818 | 0.125 | 3.880 |
| 6 | 0.4- 0.8 | 0.090 | 6.644 | 0.307 | 0.3966 | 0.142 | 4.470 |
| 7 | 0.2- 0.4 | 0.107 | 7.138 | 0.016 | 0.2950 | 0.162 | 5.239 |
| 8 | 0.1- 0.2MeV | 0.131 | 7.100 | 0 | 0.1289 | 0.173 | 6.397 |
| 9 | 46.5-100 keV | 0.187 | 6.865 | | 0.00833 | 0.146 | 6.996 |
| 10 | 21.5-46.5 | 0.314 | 6.541 | | 0.00774 | 0.122 | 6.805 |
| 11 | 10.0-21.5 | 0.590 | 6.147 | | | 0.123 | 6.689 |
| 12 | 4.65-10.0 | 0.999 | 5.612 | | | 0.073 | 6.568 |
| 13 | 2.15-4.65 | 1.376 | 5.044 | | | 0.080 | 6.381 |
| 14 | 1.0-2.15keV | 1.542 | 11.714 | | | 0.129 | 13.165 |
| 15 | 465 -1000 eV | 2.038 | 9.786 | | | 0.106 | 11.755 |
| 16 | 215 -465 | 4.638 | 22.410 | | | 0.070 | 26.884 |
| 17 | 100 -215 | 5.026 | 9.913 | | | 0.077 | 14.862 |
| 18 | 46.5-100 | 16.646 | 16.528 | | | 0.057 | 33.045 |
| 19 | 21.5-46.5 | 3.822 | 7.329 | | | 0.030 | 11.095 |
| 20 | 10.0-21.5 | 0.513 | 5.405 | | | 0.020 | 5.877 |
| 21 | 4.65-10.0 | 0.093 | 5.481 | | | 0.052 | 5.531 |
| 22 | 2.15-4.65 | 0.577 | 5.590 | | | 0.029 | 6.123 |
| 23 | 1.0-2.15 | 4.434 | 5.861 | | | 0.050 | 10.249 |
| 24 | 0.465- 1.0 | 39.699 | 6.784 | | | 0.034 | 46.431 |
| 25 | 0.215-0.465 | 509.856 | 11.957 | | | 0.205 | 521.720 |
| 26 | 0.025 eV | 2511.881 | 7.763 | 0 | 0.00774 | 0 | 2519.583 |

Table 5

26 group inelastic scattering matrix for Cd, $\sigma_n^{i, i+k}$ (Na P1 - weighting spectrum)

| $i \backslash k$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 0.001 | 0.029 | 0.177 | 0.527 | 0.575 | 0.447 | 0.179 | 0.057 | 0.017 | 0.004 | 0.001 |
| 2 | 0.008 | 0.089 | 0.422 | 0.621 | 0.581 | 0.260 | 0.088 | 0.027 | 0.006 | 0.001 | |
| 3 | 0.032 | 0.261 | 0.544 | 0.638 | 0.328 | 0.119 | 0.037 | 0.009 | 0.002 | | |
| 4 | 0.101 | 0.349 | 0.572 | 0.362 | 0.146 | 0.049 | 0.012 | 0.003 | 0.001 | | |
| 5 | 0.055 | 0.593 | 0.291 | 0.082 | 0.009 | 0.002 | | | | | |
| 6 | 0.046 | 0.110 | 0.106 | 0.040 | 0.004 | 0.001 | | | | | |
| 7 | 0.000 | 0.000 | 0.012 | 0.003 | 0.001 | | | | | | |

Table 6

26 group cross sections for Cd (ABN weighting spectrum)

| Energy group | ΔE | σ_a (b) | σ_n (b) | σ_{n^*} (b) | \overline{M}_L | σ_{er} (b) | σ_{tr} (b) |
|--------------|----------------|----------------|----------------|--------------------|------------------|-------------------|-------------------|
| 1 | 6.5 - 10.5 MeV | 0.007 | 2.068 | 2.031 | 0.7038 | 0.064 | 2.740 |
| 2 | 4.0 - 6.5 | 0.009 | 1.911 | 2.104 | 0.6154 | 0.046 | 2.856 |
| 3 | 2.5 - 4.0 | 0.015 | 2.467 | 1.973 | 0.6034 | 0.053 | 2.969 |
| 4 | 1.4 - 2.5 | 0.029 | 3.821 | 1.625 | 0.5780 | 0.064 | 3.286 |
| 5 | 0.8 - 1.4 | 0.055 | 5.232 | 1.042 | 0.4818 | 0.104 | 3.847 |
| 6 | 0.4 - 0.8 | 0.089 | 6.595 | 0.333 | 0.3966 | 0.118 | 4.445 |
| 7 | 0.2 - 0.4 | 0.106 | 7.135 | 0.018 | 0.2950 | 0.145 | 5.214 |
| 8 | 0.1 - 0.2 MeV | 0.131 | 7.100 | 0 | 0.1289 | 0.179 | 6.400 |
| 9 | 46.5 - 100 keV | 0.189 | 6.860 | | 0.00833 | 0.156 | 6.992 |
| 10 | 21.5 - 46.5 | 0.319 | 6.532 | | 0.00774 | 0.147 | 6.800 |
| 11 | 10.0 - 21.5 | 0.602 | 6.132 | | | 0.138 | 6.687 |
| 12 | 4.65 - 10.0 | 1.028 | 5.567 | | | 0.122 | 6.552 |
| 13 | 2.15 - 4.65 | 1.402 | 5.008 | | | 0.111 | 6.371 |
| 14 | 1.0 - 2.15 keV | 1.531 | 12.743 | | | 0.177 | 14.175 |
| 15 | 465 - 100 eV | 2.035 | 9.674 | | | 0.197 | 11.641 |
| 16 | 215 - 465 | 4.562 | 18.978 | | | 0.145 | 23.401 |
| 17 | 100 - 215 | 7.010 | 10.509 | | | 0.228 | 17.438 |
| 18 | 46.5 - 100 | 11.847 | 12.821 | | | 0.186 | 24.568 |
| 19 | 21.5 - 46.5 | 5.526 | 6.731 | | | 0.124 | 12.205 |
| 20 | 10.0 - 21.5 | 0.321 | 5.421 | | | 0.127 | 5.699 |
| 21 | 4.65 - 10.0 | 0.123 | 5.495 | | | 0.129 | 5.575 |
| 22 | 2.15 - 4.65 | 0.810 | 5.618 | | | 0.133 | 6.385 |
| 23 | 1.0 - 2.12 | 6.406 | 5.949 | | | 0.147 | 12.309 |
| 24 | 0.465 - 1.0 | 65.206 | 7.217 | | | 0.208 | 72.368 |
| 25 | 0.215 - 0.465 | 1392.145 | 18.531 | | | 0.954 | 1410.532 |
| 26 | 0.025 eV | 2511.881 | 7.763 | 0 | 0.00774 | 0 | 2519.583 |

Table 7

26 group inelastic scattering matrix for Cd, $\sigma_n^{i,i+k}$ (ABN weighting spectrum)

| i \ k | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 0.003 | 0.056 | 0.246 | 0.582 | 0.548 | 0.388 | 0.146 | 0.045 | 0.013 | 0.003 | 0.001 |
| 2 | 0.019 | 0.146 | 0.509 | 0.614 | 0.509 | 0.213 | 0.068 | 0.020 | 0.005 | 0.001 | |
| 3 | 0.056 | 0.337 | 0.573 | 0.591 | 0.280 | 0.097 | 0.030 | 0.007 | 0.002 | | |
| 4 | 0.164 | 0.418 | 0.561 | 0.314 | 0.118 | 0.038 | 0.009 | 0.003 | | | |
| 5 | 0.063 | 0.626 | 0.264 | 0.075 | 0.011 | 0.002 | 0.001 | | | | |
| 6 | 0.056 | 0.115 | 0.116 | 0.040 | 0.005 | 0.001 | | | | | |
| 7 | 0.000 | 0.000 | 0.014 | 0.003 | 0.001 | | | | | | |

