```
======================================================================= Mixer
                                                                        Mixer
     PROGRAM MIXER                                                      Mixer
     =============                                                      Mixer
     VERSION 76-1 (NOVEMBER 1976)                                       Mixer
     VERSION 81-1 (APRIL 1981)  *IBM VERSION                            Mixer
     VERSION 82-1 (AUGUST 1982) *COMPUTER INDEPENDENT VERSION           Mixer
     VERSION 84-1 (JUNE 1984)   *SPECIAL I/O ROUTINES TO GUARANTEE      Mixer
                                 ACCURACY OF ENERGY.                    Mixer
                                *DOUBLE PRECISION TREATMENT OF ENERGY   Mixer
                                 (REQUIRED FOR NARROW RESONANCES).      Mixer
     VERSION 86-1 (JANUARY 1986)*FORTRAN-77/H VERSION                   Mixer
     VERSION 88-1 (JULY 1988)   *OPTION...INTERNALLY DEFINE ALL I/O     Mixer
                                 FILE NAMES (SEE, SUBROUTINE FILIO1     Mixer
                                 AND FILIO2 FOR DETAILS).               Mixer
                                *IMPROVED BASED ON USER COMMENTS.       Mixer
     VERSION 89-1 (JANUARY 1989)*PSYCHOANALYZED BY PROGRAM FREUD TO     Mixer
                                 INSURE PROGRAM WILL NOT DO ANYTHING    Mixer
                                 CRAZY.                                 Mixer
                                *UPDATED TO USE NEW PROGRAM CONVERT     Mixer
                                 KEYWORDS.                              Mixer
                                *ADDED LIVERMORE CIVIC COMPILER         Mixer
                                 CONVENTIONS.                           Mixer
     VERSION 92-1 (JANUARY 1992)*UPDATED BASED ON USER COMMENTS         Mixer
                                *ADDED PHOTON CROSS SECTIONS            Mixer
                                *ADDED FORTRAN SAVE OPTION              Mixer
                                *OUTPUT IN ENDF/B-VI FORMAT             Mixer
                                *COMPLETELY CONSISTENT I/O ROUTINES -   Mixer
                                 TO MINIMIZE COMPUTER DEPENDENCE.       Mixer
                                *NOTE, CHANGE IN INPUT PARAMETER        Mixer
                                 FORMAT.                                Mixer
     VERSION 94-1 (JANUARY 1994)*VARIABLE ENDF/B DATA FILENAMES         Mixer
                                 TO ALLOW ACCESS TO FILE STRUCTURES     Mixer
                                 (WARNING - INPUT PARAMETER FORMAT      Mixer
                                 HAS BEEN CHANGED)                      Mixer
                                *CLOSE ALL FILES BEFORE TERMINATING     Mixer
                                 (SEE, SUBROUTINE ENDIT)                Mixer
                                *INCREASED INCORE PAGE SIZE FROM        Mixer
                                 1002 TO 4008.                          Mixer
     VERSION 96-1 (JANUARY 1996) *COMPLETE RE-WRITE                     Mixer
                                 *IMPROVED COMPUTER INDEPENDENCE        Mixer
                                 *ALL DOUBLE PRECISION                  Mixer
                                 *ON SCREEN OUTPUT                      Mixer
                                 *UNIFORM TREATMENT OF ENDF/B I/O       Mixer
                                 *IMPROVED OUTPUT PRECISION             Mixer
                                 *DEFINED SCRATCH FILE NAMES            Mixer
                                 *INCREASED INCORE PAGE SIZE FROM       Mixer
                                  4008 TO 12000.                        Mixer
     VERSION 99-1 (MARCH 1999)   *CORRECTED CHARACTER TO FLOATING       Mixer
                                  POINT READ FOR MORE DIGITS            Mixer
                                 *UPDATED TEST FOR ENDF/B FORMAT        Mixer
                                  VERSION BASED ON RECENT FORMAT CHANGE Mixer
                                 *GENERAL IMPROVEMENTS BASED ON         Mixer
                                  USER FEEDBACK                         Mixer
     VERSION 99-2 (JUNE 1999)    *ASSUME ENDF/B-VI, NOT V, IF MISSING   Mixer
                                  MF=1, MT-451.                         Mixer
     VERS. 2000-1 (FEBRUARY 2000)*GENERAL IMPROVEMENTS BASED ON         Mixer
                                  USER FEEDBACK                         Mixer
     VERS. 2002-1 (MAY 2002)     *OPTIONAL INPUT PARAMETERS             Mixer
     VERS. 2004-1 (MARCH 2004)   *ADDED INCLUDE FOR COMMON              Mixer
                                 *INCREASED INCORE PAGE SIZE FROM       Mixer
                                  12000 TO 60000.                       Mixer
     VERS. 2005-1 (OCT. 2005)    *CORRECTED MERGE ERROR                 Mixer
     VERS. 2007-1 (JAN. 2007)    *CHECKED AGAINST ALL ENDF/B-VII        Mixer
                                 *INCREASED INCORE PAGE SIZE FROM       Mixer
                                  60,000 TO 240,000.                    Mixer
     VERS. 2007-2 (DEC. 2007)    *72 CHARACTER FILE NAMES.              Mixer
     VERS. 2008-1 (JUNE 2008)    *ADDED GRAMS OR ATOMS INPUT            Mixer
     VERS. 2010-1 (Apr. 2010)    *General update based on user feedback Mixer
     VERS. 2012-1 (Aug. 2012)    *Added CODENAME                        Mixer
                                 *32 and 64 bit Compatible              Mixer
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                           *Added ERROR stop                        Mixer
VERS. 2015-1 (Jan. 2015)   *Extended OUT9.                          Mixer
                           *Replaced ALL 3 way IF Statements.       Mixer
VERS. 2017-1 (May  2017)   *Increse max. points to 1,200,000        Mixer
                           *updated based on user feedbsck.         Mixer
                           *All floating input parameters changed   Mixer
                            to character input + IN9 conversion.    Mixer
VERS. 2018-1 (Jan. 2018)   *Added on-line output for ALL ENDERROR   Mixer
                                                                    Mixer
OWNED, MAINTAINED AND DISTRIBUTED BY                                Mixer
-----------------------------------                                 Mixer
THE NUCLEAR DATA SECTION                                            Mixer
INTERNATIONAL ATOMIC ENERGY AGENCY                                  Mixer
P.O. BOX 100                                                        Mixer
A-1400, VIENNA, AUSTRIA                                             Mixer
EUROPE                                                              Mixer
                                                                    Mixer
ORIGINALLY WRITTEN BY                                               Mixer
-----------------------------------                                 Mixer
Dermott E. Cullen                                                   Mixer
                                                                    Mixer
PRESENT CONTACT INFORMATION                                         Mixer
---------------------------                                         Mixer
Dermott E. Cullen                                                   Mixer
1466 Hudson Way                                                     Mixer
Livermore, CA 94550                                                 Mixer
U.S.A.                                                              Mixer
Telephone  925-443-1911                                             Mixer
E. Mail    RedCullen1@Comcast.net                                   Mixer
Website    RedCullen1.net/HOMEPAGE.NEW                              Mixer
                                                                    Mixer
PURPOSE                                                             Mixer
-------                                                             Mixer
THIS PROGRAM IS DESIGNED TO CALCULATE THE ENERGY DEPENDENT CROSS    Mixer
SECTION FOR A COMPOSITE MIXTURE OF UP TO 10 DIFFERENT MATERIALS.    Mixer
                                                                    Mixer
THE PRESENT VERSION WILL ONLY CALCULATE THE CROSS SECTION FOR ONE   Mixer
FINAL REACTION (ENDF/B SECTION), E.G. TOTAL CROSS SECTION, BUT NOT  Mixer
ANY OTHER REACTION.                                                 Mixer
                                                                    Mixer
NOTE, THIS PROGRAM WILL NOT COMBINE ALL REACTIONS FOR A MIXTURE     Mixer
OF MATERIALS DURING A SINGLE RUN - ONLY ONE REACTION WILL BE        Mixer
CREATED PER RUN.                                                    Mixer
                                                                    Mixer
EVALUATED DATA FORMAT                                               Mixer
---------------------                                               Mixer
THE CROSS SECTIONS ARE READ FROM THE ENDF/B FORMAT AND THE          Mixer
COMPOSITE CROSS SECTION IS CONVERTED TO AN EQUIVALENT BARNS/ATOM    Mixer
FORM AND OUTPUT IN THE ENDF/B FORMAT WITH AN EQUIVALENT ATOMIC      Mixer
WEIGHT. THE USER MUST SPECIFY THE COMPOSITION BY GIVING THE ZA,     Mixer
MT AND GRAMS OR ATOMS OF EACH CONSTITUENT. IN ADDITION THE USER     Mixer
IDENTIFY THE COMPOSITE CROSS SECTION BY SPECIFYING THE ZA, MAT      Mixer
AND MT TO BE USED IN THE ENDF/B FORMATTED OUTPUT.                   Mixer
                                                                    Mixer
SINCE ONLY THE CROSS SECTIONS IN FILE 3 AND 23 ARE USED, AND THE    Mixer
FORMAT FOR FILE 3/23 IS THE SAME IN ALL VERSIONS ON ENDF/B, THIS    Mixer
PROGRAM MAY BE USED WITH ANY VERSION OF ENDF/B DATA (I.E.,          Mixer
ENDF/B-I, II, III, IV, V OR VI). DURING A SINGLE RUN IT MAY EVEN    Mixer
BE USED TO READ AND COMBINE EVALUATIONS WHICH ARE IN DIFFERENT      Mixer
VERSIONS OF THE ENDF/B FORMAT.                                      Mixer
                                                                    Mixer
ENDF/B FORMATTED OUTPUT WILL BE IN THE ENDF/B-VI FORMAT REGARDLESS  Mixer
OF THE FORMAT OF THE INPUT ENDF/B DATA. THIS WILL ONLY EFFECT THE   Mixer
HOLLERITH SECTION (MF=1, MT=451). THE FORMAT OF CROSS SECTIONS      Mixer
(MF=3) IS THE SAME IN ALL VERSION OF THE ENDF/B FORMAT.             Mixer
                                                                    Mixer
IN ORDER TO GUARANTEE PROPER OPERATION OF THIS PROGRAM THE DATA     Mixer
MUST BE PROPERLY CODED IN THE ENDF/B FORMAT. NO ERROR CHECKING IS   Mixer
PERFORMED. IT IS PARTICULARLY IMPORTANT THAT THE FOLLOWING DATA     Mixer
BE CORRECT                                                          Mixer
                                                                    Mixer
```

(1) ZA, MF, MT - MUST BE CORRECT IN ORDER TO ALLOW PROGRAM TO Mixer
SELECT THE APPROPRIATE SECTIONS TO BE COMBINED. Mixer
(2) AWRE - ATOMIC WEIGHT RATIO MUST BE CORRECT TO ALLOW PROGRAM Mixer
TO CONVERT THE USER SPECIFIED GRAMS INTO ATOMS FOR Mixer
PROPER ATOM RATIO MIXING. Mixer
(3) (ENERGIES, CROSS SECTIONS) - MUST BE CORRECT, LINEARLY Mixer
======== Mixer
INTERPOLABLE, IN ASCENDING ENERGY ORDER OF (E, BARNS). Mixer
============ Mixer
Mixer
TO CONVERT ENDF/B FORMATTED DATA TO THE REQUIRED INPUT FORM Mixer
THE FOLLOWING PROGRAMS MAY BE USED, Mixer
LINEAR - CONVERT TABULATED CROSS SECTIONS TO LINEARLY Mixer
INTERPOLABLE FORM. Mixer
RECENT - RECONSTRUCT RESONANCE CONTRIBUTION, ADD TO BACKGROUND Mixer
CROSS SECTION AND OUTPUT THE COMBINATION IN LINEARLY Mixer
INTERPOLABLE FORM. Mixer
SIGMA1 - DOPPLER BROADEN CROSS SECTIONS TO ANY TEMPERATURE AND Mixer
OUTPUT THE RESULT IN LINEARLY INTERPOLABLE FORM. Mixer
Mixer
DOCUMENTATION Mixer
------------ Mixer
THE FACT THAT THIS PROGRAM HAS COMBINED THE DATA IS DOCUMENTED Mixer
IN THE OUTPUT ENDF/B FORMAT IN THE HOLLERITH SECTION BY FIRST Mixer
IDENTIFYING THE VERSION OF THIS PROGRAM THAT WAS USED, IN THE FORM Mixer
Mixer
**********(PROGRAM MIXER 2018-1) ********** Mixer
Mixer
THIS IS FOLLOWED BY THE TWO LINE IDENTIFICATION INPUT BY THE USER. Mixer
THIS IS FOLLOWED BY COMPOSITION INPUT BY THE USER. Mixer
Mixer
NEUTRON OR PHOTON DATA Mixer
---------- Mixer
THIS PROGRAM WILL ALLOW YOU TO PROCESS EITHER NEUTRON OR PHOTON Mixer
CROSS SECTIONS - BUT YOU CANNOT MIX THE TWO TYPES TOGETHER. BY Mixer
INPUT YOU CAN SPECIFY THE OUTPUT MF = 3 (NEUTRONS) OR 23 (PHOTONS) Mixer
WHATEVER TYPE YOU SPECIFIED FOR OUTPUT IS THE ONLY TYPE OF DATA Mixer
WHICH WILL BE PROCESSED BY THIS PROGRAM. Mixer
Mixer
DEFINING THE COMPOSITION Mixer
---------- Mixer
THE USER MAY SPECIFY UP TO 10 DIFFERENT SECTIONS OF DATA TO BE Mixer
COMBINED, EACH SECTION IDENTIFIED BY ZA AND MT NUMBER. THE Mixer
AMOUNT OF EACH MATERIAL IS SPECIFIED BY DEFINING THE NUMBER OF Mixer
GRAMS OF EACH MATERIAL IN THE COMPOSITE MIXTURE. THIS CAN BE Mixer
DERIVED FROM THE VOLUME FRACTION SIMPLY BY MULTIPLYING THE STP Mixer
DENSITY OF EACH MATERIAL BY ITS VOLUME FRACTION. NOTE, DO NOT Mixer
INPUT ATOM FRACTIONS. Mixer
Mixer
THE LIST OF SECTIONS TO BE COMBINED MAY BE SPECIFIED IN ANY Mixer
ORDER, I.E. THEY NEED NOT BE IN ZA ORDER OR THE ORDER THAT THE Mixer
EVALUATED DATA APPEARS ON THE ENDF/B FORMATTED TAPE. Mixer
Mixer
IF ANY REQUESTED SECTION OF DATA IS NOT FOUND ON THE ORIGINAL Mixer
ENDF/B FORMATTED FILE, THE PROGRAM WILL PRINT A LIST OF THE Mixer
MISSING SECTIONS AND TERMINATE. IF ALL REQUESTED SECTIONS ARE Mixer
FOUND THE PROGRAM WILL PRODUCE A COMPOSITE SECTION USING THE Mixer
UNION OF ALL ENERGIES FOUND IN ANY SECTION. THE COMPOSITE SECTION Mixer
WILL NOT BE THINNED. Mixer
Mixer
PRIOR TO LATER USE IN ANY APPLICATION THE NUMBER OF ENERGY POINTS Mixer
IN THE COMPOSITE CROSS SECTION MAY BE MINIMIZED BY USING PROGRAM Mixer
LINEAR, UCRL-50400, VOL. 17, PART B TO THIN THE DATA. Mixer
Mixer
ONLY LINEARLY INTERPOLABLE DATA Mixer
---------- Mixer
THE CROSS SECTIONS TO BE COMBINED MUST BE IN LINEARLY INTERPOLABLE Mixer
TABULATED FORM (I. E., FILE 3 OR 23, INTERPOLATION LAW 2). Mixer
Mixer
TO CONVERT TABULATED CROSS SECTIONS TO LINEARLY INTERPOLABLE FORM Mixer
SEE, PROGRAM LINEAR, UCRL-50400, VOL. 17, PART A. Mixer

TO CONVERT RESONANCE PARAMETERS TO LINEARLY INTERPOLABLE FORM SEE, PROGRAM RECENT, UCRL-50400, VOL. 17, PART C.

TO DOPPLER BROADEN LINEARLY INTERPOLABLE DATA TO ANY TEMPERATURE SEE PROGRAM SIGMA1, UCRL-50400, VOL. 17, PART B.

PAGING SYSTEM

THERE IS NO LIMIT TO THE THE NUMBER OF DATA POINTS IN EACH OF THE SECTIONS TO BE COMBINED, NOR IS THERE A LIMIT TO THE NUMBER OF DATA POINTS IN THE COMPOSITE MIXTURE CROSS SECTION.

ALL REQUIRED SECTIONS OF DATA ARE READ FROM THE ORIGINAL ENDF/B FORMATTED FILE. ANY SECTION OF 60000 OR FEWER POINTS WILL BE TOTALLY CORE RESIDENT. LARGER SECTIONS ARE LOADED INTO A PAGING SYSTEM USING A SCRATCH FILE WITH ONLY 60000 POINTS PER SECTION CORE RESIDENT AT ANY ONE TIME. SIMILARLY THE COMPOSITE SECTION WILL BE TOTALLY CORE RESIDENT IF IT CONTAINS 60000 OR FEWER POINTS AND LARGER COMPOSITE SECTIONS WILL BE LOADED INTO A PAGING SYSTEM WHERE ONLY 60000 POINTS ARE CORE RESIDENT AT ANY TIME. SINC A PAGING SYSTEM MAY BE USED BY ANY SECTION OF DATA THERE IS NO LIMIT TO THE SIZE OF EITHER THE ORIGINAL SECTIONS, NOR TO THE COMPOSITE SECTION, E.G. A SECTION MAY CONTAIN 100,000 ENERGIES AND CROSS SECTIONS TO DESCRIBE A GIVEN REACTION.

PAGE SIZE

THE PAGE SIZE USED IN THIS PROGRAM IS DEFINED BY THE PARAMETER NPAGE AND THE DIMENSIONS OF THE ARRAYS XTAB AND YTAB. IN ORDER TO ADAPT THIS PROGRAM FOR USE ON ANY COMPUTER THE PAGE SIZE MAY BE INCREASED OR DECREASED BUT THE FOLLOWING RULES MUST BE FOLLOWED
====

(1) NPAGE - MUST BE A MULTIPLE OF 3 IN ORDER TO ALLOW THE PROGRAM TO READ FULL CARDS OF ENDF/B DATA (3 POINTS PER LINE). FAILURE TO FOLLOW THIS RULE CAN LEAD TO LOSS OF DATA AND/OR PROGRAM ERRORS DURING EXECUTION.
(3) YTAB - THE DIMENSION OF YTAB MUST BE (NPAGE,11).
(4) XTAB - THE DIMENSION OF XTAB MUST BE (NPAGE,11).

DOPPLER BROADENING

THE COMPOSITE CROSS SECTION OUTPUT FROM THIS PROGRAM SHOULD NOT BE DOPPLER BROADENED USING PROGRAM SIGMA1, OR THE EQUIVALENT. THE ATOMIC WEIGHT USED TO IDENTIFY THE COMPOSITE MIXTURE IS BASED ON THE ATOM FRACTION OF EACH CONSTITUENT AND CANNOT BE USED TO CHARACTERIZE THE BROADENING OF ANY GIVEN RESONANCE IN THE MIXTURE DUE TO THE CONTRIBUTION OF ONE CONSTITUENT. IN ORDER TO CONSIDER DOPPLER BROADENING FIRST USE PROGRAM SIGMA1 TO BROADEN THE CROSS SECTION FOR EACH OF THE CONSTITUENTS AND THEN COMBINE THE BROADENED DATA USING PROGRAM MIXER.

EXAMPLE USE

THE OUTPUT FROM THIS PROGRAM HAS BEEN FOUND TO BE EXTREMELY USEFUL IN THE FOLLOWING APPLICATIONS...

(1) CALCULATE A COMPOSITE TOTAL CROSS SECTON FOR LATER USE AS A WEIGHTING FUNCTION IN SELF-SHIELDING THE CROSS SECTIONS OF EACH CONSTITUENT OF THE MIXTURE SEPARATELY.

    PROGRAM GROUPIE CAN USE THE CALCULATED COMPOSITE TOTAL CROSS SECTION AS THE TOTAL CROSS SECTION FOR EACH CONSTITUENT OF THE MIXTURE IN ORDER TO CALCULATE SELF-SHIELDED CROSS SECTION FOR EACH CONSTITUENT OF THE MIXTURE.

(2) CALCULATE COMPOSITE TOTAL AND FISSION CROSS SECTIONS IN ORDER TO CALCULATE THE TRANSMISSION AND SELF-INDICATION THROUGH COMPOSITE MATERIALS. GENERALLY IN THIS CASE THE TOTAL CROSS SECTION WILL BE CALCULATED FOR THE COMPOSITION

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    OF THE SAMPLE AND THE FISSION CROSS SECTION WILL BE            Mixer
    CALCULATED FOR THE COMPOSITION OF THE FISSION CHAMBER          Mixer
    (WHICH GENERALLY WILL HAVE A DIFFERENT COMPOSITION THAN THE    Mixer
    SAMPLE).                                                       Mixer
                                                                   Mixer
    PROGRAM VIRGIN CAN USE THE OUTPUT FROM THIS PROGRAM TO         Mixer
    PERFORM TRANSMISSION AND SELF-INDICATION CALCULATIONS.         Mixer
    PROGRAM VIRGIN WILL ANALYTICALLY CALCULATE THE UNCOLLIDED      Mixer
    (I.E. VIRGIN) FLUX TRANSMITTED AND REACTION RATE DUE TO ANY    Mixer
    TABULATED LINEARLY INTERPOLABLE INCIDENT SPECTRUM. RESULTS     Mixer
    WILL BE PRESENTLY FOR UP TO 10 DIFFERENT SAMPLE THICKNESSES    Mixer
    AND BINNED INTO ENERGY GROUPS IN ORDER TO SIMULATE AN          Mixer
    EXPERIMENTAL MEASUREMENT.                                      Mixer
                                                                   Mixer
(3) THE OUTPUT FROM THIS PROGRAM IS VERY USEFUL TO PLOT IN ORDER   Mixer
    TO SEE THE IMPORTANCE OF SPECIFIC CROSS SECTION FEATURES IN    Mixer
    THE COMPOSITE CROSS SECTION.                                   Mixer
                                                                   Mixer
    PROGRAM COMPLOT CAN BE USED TO PLOT THE OUTPUT FROM THIS       Mixer
    PROGRAM AND IF REQUIRED EXAMINE ANY PARTICULAR ENERGY RANGE    Mixer
    IN DETAIL. IN ORDER TO DO THIS THE (ZA, MT) EQUIVALENCE OPTION Mixer
    OF PROGRAM COMPLOT SHOULD BE USED. TO COMPARE ANY CONSTITUENT  Mixer
    CROSS SECTION TO THE COMPOSITE CROSS SECTION THE INPUT TO      Mixer
    COMPLOT SHOULD EQUATE THE (ZA,MT) OF THE COMPOSITE TO THE      Mixer
    (ZA,MT) OF ONE CONSTITUENT AND THE MULTIPLIER INPUT TO         Mixer
    COMPLOT SHOULD BE THE ATOM FRACTION FOR THE CONSTITUENT (THE   Mixer
    ATOM FRACTIONS ARE DEFINED IN THE OUTPUT LISTING FROM PROGRAM  Mixer
    MIXER).                                                        Mixer
                                                                   Mixer
INPUT FILES                                                        Mixer
-----------                                                        Mixer
UNIT  DESCRIPTION                                                  Mixer
----  -----------                                                  Mixer
  2   INPUT CARDS (BCD - 80 CHARACTERS/RECORD)                     Mixer
 10   ORIGINAL EVALUATED DATA IN ENDF/B FORMAT                     Mixer
                 (BCD - 80 CHARACTERS/RECORD)                      Mixer
                                                                   Mixer
OUTPUT FILES                                                       Mixer
------------                                                       Mixer
UNIT  DESCRIPTION                                                  Mixer
----  -----------                                                  Mixer
  3   OUTPUT LISTING (BCD - 120 CHARACTERS/RECORD)                 Mixer
 11   COMPOSITE EVALUATED DATA IN ENDF/B FORMAT                    Mixer
              (BCD - 80 CHARACTERS/RECORD)                         Mixer
                                                                   Mixer
SCRATCH FILES                                                      Mixer
-------------                                                      Mixer
UNIT  DESCRIPTION                                                  Mixer
----  -----------                                                  Mixer
 12   SCRATCH FILE FOR EACH OF THE 10 SECTIONS WHICH               Mixer
 13   WILL BE ADDED TOGETHER TO DEFINE THE FINAL                   Mixer
  .   SECTION (BINARY - 60000 AND 480000 WORDS/RECORD)            Mixer
  . .                                                              Mixer
  . .                                                              Mixer
 20 .                                                              Mixer
 21 .                                                              Mixer
 22   SCRATCH FILE FOR COMBINED SECTION.                           Mixer
      (BINARY - 2004 WORDS/RECORD)                                 Mixer
                                                                   Mixer
STANDARD FILE NAMES (SEE SUBROUTINES FILIO1 AND FILIO2)            Mixer
-------------------------------------------------------------      Mixer
UNIT  FILE NAME                                                    Mixer
----  ----------                                                   Mixer
  2   MIXER.INP                                                    Mixer
  3   MIXER.LST                                                    Mixer
 10   ENDFB.IN                                                     Mixer
 11   ENDFB.OUT                                                    Mixer
12-22 (SCRATCH)                                                    Mixer
                                                                   Mixer
INPUT CARDS                                                        Mixer
-----------                                                        Mixer
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LINE  COLS.  FORMAT  NAME    DESCRIPTION                                Mixer
----  -----  ------  ------- ----------                                 Mixer
 1-2   1-66 16A4,A2  TITLE   TWO LINE TITLE DESCRIBING PROBLEM         Mixer
                             (THIS TITLE IS USED TO IDENTIFY THE       Mixer
                             OUTPUT LISTING AND IS ALSO WRITTEN        Mixer
                             IN MF=1, MT=451 (HOLLERITH SECTION)       Mixer
                             OF THE ENDF/B FORMATTED OUTPUT TO         Mixer
                             IDENTIFY THE COMPOSITE MIXTURE).          Mixer
   3   1-72                  ENDF/B INPUT DATA FILENAME                Mixer
                             (STANDARD OPTION = ENDFB.IN)              Mixer
   4   1-72                  ENDF/B OUTPUT DATA FILENAME               Mixer
                             (STANDARD OPTION = ENDFB.OUT)             Mixer
   5   1-11    I11   IZAOUT  ZA IDENTIFICATION FOR COMBINATION         Mixer
   5  12-17    I6    MATOUT  MAT IDENTIFICATION FOR COMBINATION        Mixer
   5  18-19    I2    MFOUT   MF IDENTIFICATION FOR COMBINATION         Mixer
   5  20-22    I3    MTOUT   MT IDENTIFICATION FOR COMBINATION         Mixer
   5  23-33    I11   DEFINE INPUT DENSITY                              Mixer
                       = 0 = GRAMS = BACKWARDS COMPATIBLE              Mixer
                       > 0 = ATOMS = NEW IN 2008                       Mixer
 6-N   1-11    I11   IZAGET  ZA (1000*Z+A) OF MATERIAL                 Mixer
 6-N  12-22    I11   MTGET   MT OF REACTION                            Mixer
 6-N  23-33  E11.4   DENSE   MATERIAL DENSITY (ATOMS OR GRAMS)         Mixer
                                                                       Mixer
THE SIXTH LINE IS REPEATED FOR EACH SECTION (FROM 2 TO 10).            Mixer
SINCE THE ENDF/B FORMATTED OUTPUT IS IN BARNS/ATOM FORM A MINIMUM      Mixer
OF TWO SECTIONS MUST BE COMBINED (I.E., IF ONLY ONE SECTION IS         Mixer
SPECIFIED THE OUTPUT WOULD BE IDENTICAL TO THE INPUT AND AS SUCH       Mixer
THE PROGRAM WILL CONSIDER THIS TO BE AN ERROR AND NOT PERFORM THE      Mixer
CALCULATION). THE LIST OF SECTIONS IS TERMINATED BY A BLANK LINE.      Mixer
                                                                       Mixer
THE LIST OF SECTIONS TO BE COMBINED MAY BE SPECIFIED IN ANY            Mixer
ORDER, I.E. THEY NEED NOT BE IN ZA ORDER OR THE ORDER THAT THE         Mixer
EVALUATED DATA APPEARS ON THE ENDF/B FORMATTED TAPE.                   Mixer
                                                                       Mixer
EXAMPLE INPUT NO. 1                                                    Mixer
-------------------                                                    Mixer
CREATE THE TOTAL CROSS SECTION (MT=1) FOR STAINLESS STEEL AND          Mixer
IDENTIFY THE COMBINED MATERIAL WITH ZA=26800 AND MAT=4000,             Mixer
THE COMPOSITION BY VOLUME OF THE STEEL WILL BE...                      Mixer
                                                                       Mixer
THE DATA FROM \ENDFB6\K300\LIBRARY.DAT AND WRITE DATA TO               Mixer
\MIXER\STEEL.DAT                                                       Mixer
                                                                       Mixer
IRON      - 74.8 PER-CENT                                              Mixer
CHROMIUM  - 16.0                                                       Mixer
NICKEL    -  6.0                                                       Mixer
MANGANESE -  2.0                                                       Mixer
SILICON   -  1.0                                                       Mixer
CARBON    -  0.2                                                       Mixer
                                                                       Mixer
THE INPUT MUST SPECIFY THE COMPOSITION BY GRAMS OR ATOMS. THIS IS      Mixer
DEFINED AS THE PRODUCT OF THE STANDARD DENSITY (GRAMS)                 Mixer
TIMES THE VOLUME FRACTION. FOR THIS EXAMPLE THE FOLLOWING 12           Mixer
INPUT CARDS ARE REQUIRED....                                           Mixer
                                                                       Mixer
STAINLESS STEEL. COMPOSITION BY PER-CENT VOLUME IS 74.8-IRON,          Mixer
16-CHROME, 6-NICKEL, 2-MANGANESE, 1-SILICON, 0.2-CARBON                Mixer
\ENDFB6\K300\LIBRARY.DAT                                               Mixer
\MIXER\STEEL.DAT                                                       Mixer
     26800  4000 3  1          0                                      Mixer
     26000          1 5.88676    (NOTE, GRAMS INPUT FOR EACH          Mixer
     24000          1 1.150448    CONSTITUENT, E.G. FOR IRON THE      Mixer
     28000          1 0.533928    STP DENSITY IS 7.87 GRAMS.          Mixer
     25055          1 0.1486      THE INPUT VALUE OF 5.88676 IS       Mixer
     14000          1 0.0233      0.748 X 7.87,I.E.  VOLUME           Mixer
      6012          1 0.0044958   FRACTION TIMES STP DENSITY).        Mixer
                                (BLANK LINE TERMINATES INPUT LIST)     Mixer
                                                                       Mixer
EXAMPLE INPUT NO. 2                                                    Mixer
-------------------                                                    Mixer
THE SAME EXAMPLE AS THE ABOVE PROBLEM, ONLY USE THE STANDARD           Mixer
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     ENDF/B DATA FILENAMES - ENDFB.IN AND ENDFB.OUT (THIS CAN BE        Mixer
     DONE BY LEAVING THE THIRD AND FOURTH INPUT LINES BLANK).           Mixer
     FOR THIS EXAMPLE THE FOLLOWING 12 INPUT CARDS ARE REQUIRED....     Mixer
                                                                        Mixer
     STAINLESS STEEL. COMPOSITION BY PER-CENT VOLUME IS 74.8-IRON,      Mixer
     16-CHROME, 6-NICKEL, 2-MANGANESE, 1-SILICON, 0.2-CARBON            Mixer
     (NOTE - THIS LINE IS REALLY BLANK)                                 Mixer
     (NOTE - THIS LINE IS REALLY BLANK)                                 Mixer
          26800  4000 3  1                                             Mixer
          26000          1 5.88676    (NOTE, GRAMS INPUT FOR EACH       Mixer
          24000          1 1.150448    CONSTITUENT, E.G. FOR IRON THE   Mixer
          28000          1 0.533928    STP DENSITY IS 7.87 GRAMS.       Mixer
          25055          1 0.1486      THE INPUT VALUE OF 5.88676 IS    Mixer
          14000          1 0.0233      0.748 X 7.87,I.E.  VOLUME        Mixer
           6012          1 0.0044958   FRACTION TIMES STP DENSITY).     Mixer
                                     (BLANK LINE TERMINATES INPUT LIST) Mixer
                                                                        Mixer
=======================================================================Mixer
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