

A Compact ENDF (ACE) Format Specification

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1 Introduction

The ACE format consists of two *types* and nine *classes* of data. The data are kept in an ACE Table. The term ACE Table and ACE file are often used interchangeably.

1.1 Types of ACE-Formatted Data

There are two types of ACE-formatted data; simply called Type 1 and Type 2.

Type 1 Standard formatted tables. These tables contain ASCII text and are machine independent; they are readable on every machine.

Type 2 Standard unformatted tables. These tables are binary and can be generated from the Type 1 files. They are more compact and faster to read than the Type 1 ACE Tables but are machine/platform dependent; they are not readable on every machine.

Traditionally Type 2 ACE files were more commonly used because they were smaller in size and faster to read. However due to the fact that they are not portable across machines and platforms they have fallen out of fashion.

1.2 Classes of ACE-Formatted Data

There are nine classes of ACE-formatted data:

1. continuous-energy neutron (see Section 3),
2. discrete-reaction neutron,
3. continuous-energy photoatomic interaction,
4. continuous-energy electron interaction,
5. continuous-energy photonuclear interaction,
6. neutron dosimetry,
7. $S(\alpha, \beta)$ thermal,
8. neutron multigroup, and
9. photoatomic multigroup.

Each of these classes of data are described later in this document.

An ACE Table is an entity that contains evaluation-dependent data about one of the nine classes of data for a specific material—an target isotope, isomer, or element. For a given ZAID, the data contained on a Type 1 and Type 2 tables are identical. Simulations run with one type of data should produce identical results as those run with the other type of data.

1.3 ACE Libraries

A collection of ACE data tables that derive from a single set of evaluation files are typically grouped together in a “library”—not to be confused from the evaluation library from which they derive. Multiple ACE data tables can concatenated into the same logical file on the computer, although this has fallen somewhat out of fashion due to the large amount of data on each ACE table derived from modern evaluation files. Applications that use ACE-formatted data should produce the same results regardless of whether the tables are contained in one logical file on the computer or spread across many.

2 Locating Data on a Type 1 Table

3 Continuous Energy Neutron