



Elevator Door Systems, Kinetic Energy, and ASME A17.1 2000.

Requirement 2.13.4.2.4 of ASME A17.1 2000 stipulates that a data tag be attached to the door operator or car crosshead. If you are in a jurisdiction that has adopted the 2000 code, you need to read and understand this requirement, and all of the related requirements. (see attached)

The data tag is required to show:

- The minimum code closing time for the door system that will result in average kinetic energy of less than 7.37 foot pounds.
- The minimum code closing time for the door system, when in nudging, that will result in average kinetic energy of less than 2.5 foot pounds.

The attached spread sheets are designed to give GAL customers the information necessary to comply with these requirements. If you use all GAL equipment, and follow GAL instructions, these sheets will give you the minimum code closing time for all of the normal door configurations, sizes, and operator models available.

Notes:

Code Closing Distance / Time

On side opening, the code distance starts 2" from the jamb and goes to 2" from full close. (opening size – 4") On center opening, code distance starts 1" from the jamb and goes to 1" from full close. (still opening size – 4") Times shown are minimums for the code closing distance

Average Kinetic Energy (7.37 ft lbs)

This is what is reflected in the times shown on the spread sheets. The rotational inertia of the motor and operator is included in these calculations. GAL's calculations include 'equipment rigidly connected thereto' and accommodate all hangers, rollers, clutches, closers, releases, and any normal reopening devices

Actual (peak) Kinetic Energy (17 ft lbs)

With GAL equipment and following GAL instructions, if your times comply with the requirements shown for average KE, you will not exceed the requirement for actual (peak) KE.

Nudging Kinetic Energy (2.5 ft lbs)

If you take the minimum code closing time for your application and double it, you will have a safe time to use for the requirement under nudging. (Note – this is a very conservative time, if you really want to close your door quickly while in nudging, you can call GAL for an absolute minimum)

Non Standard Systems

If you have a non-standard application, like three speed doors, or panels that are so heavy or light that they fall outside the range shown on the spread sheets, you can call GAL and we will calculate code closing times for your job.

2.13.4.2.4 Data Plate. A data plate conforming to 2.16.3.3 shall be attached to the power door operator or to the car crosshead and shall contain the following information:

- (a) minimum door closing time in seconds for the doors to travel the code zone distance as specified in 2.13.4.2.2 corresponding to the kinetic energy limits specified in 2.13.4.2.1(b)(2);
- (b) minimum door closing time in seconds for the doors to travel the Code zone distance as specified in 2.13.4.2.2 corresponding to the kinetic energy limits specified in 2.13.4.2.1(c)(2), if applicable [see 2.27.3.1.6(e)];
- (c) where heavier hoistway doors are used at certain floors, the minimum door closing time in seconds corresponding to the kinetic energy limits specified in 2.13.4.2.1(b)(2) and 2.13.4.2.1(c)(2), if applicable, for the corresponding floors shall be included on the data plate.

2.13.4.2.1 Kinetic Energy.....

(a) Where the hoistway door and the car door/gate are closed in such a manner that stopping either one manually will stop both, the kinetic energy of the closing door system shall be based upon the sum of the hoistway and the car door weights, as well as all parts rigidly connected thereto, including the rotational inertia effects of the door operator and the connecting transmission to the door panels.

(b) Where a reopening device conforming to 2.13.5 is used, the closing door system shall conform to the following requirements.

(1) The kinetic energy computed for the actual closing speed at any point in the code zone distance defined by 2.13.4.2.2 shall not exceed 23 J (17 ft-lbf); and

(2) The kinetic energy computed for the average closing speed as determined in accordance with 2.13.4.2.2 shall not exceed 10 J (7.37 ft-lbf).

(c) Where a reopening device is not used, or has been rendered inoperative (see 2.13.5), the closing door system shall conform to the following requirements:

(1) The kinetic energy computed for the actual closing speed at any point in the code zone distance defined by 2.13.4.2.2 shall not exceed 8 J (6 ft-lbf).

(2) The kinetic energy computed for the average closing speed within the code zone distance (see 2.13.4.2.2), or in any exposed opening width, including the last increment of door travel, shall not exceed 3.5 J (2.5 ft-lbf).