

TITLE 30—MINERAL RESOURCES**Chapter I—Bureau of Mines, Department of the Interior**

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*** REGULATIONS****Subchapter E—Mechanical Equipment for Mines;
Tests for Permissibility; Fees**

[Bureau of Mines Schedule 28]

**PART 34—FIRE-RESISTANT CONVEYOR
BELTS**

There was published in the FEDERAL REGISTER of September 1, 1955 (20 F. R. 6475), a notice and text of proposed regulations amending the title of Subchapter E of Title 30, Code of Federal Regulations and prescribing requirements governing investigations leading to acceptability of Fire-Resistant Conveyor Belts. After consideration of all relevant material presented pursuant to the notice, the regulations as published in the FEDERAL REGISTER of September 1, 1955, and as corrected in the FEDERAL REGISTER of October 26, 1955 (20 F. R. 8050), are hereby adopted without change.

F. E. WORMSER,

Assistant Secretary of the Interior.

NOVEMBER 4, 1955.

* The regulatory material appearing herein is keyed to the CODE OF FEDERAL REGULATIONS, which is published, under 50 titles, pursuant to section 11 of the Federal Register Act, as amended August 5, 1953.

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AUTHORITY: §§ 34.1 to 34.17 issued under sec. 5, 36 Stat. 370, as amended; 30 U. S. C. sec. 7. Interpret or apply secs. 2, 3, Stat. 370, as amended, 30 U. S. C. 3, 5.

§ 34.1 *Definitions*—(a) *Fire-resistant conveyor belt*. A conveyor belt that is identical in all respects to the sample of the conveyor belt designated as acceptable under this part.

(b) *Sample*. That portion of a conveyor belt submitted to the Bureau by a manufacturer for acceptance testing.

(c) *Specimen*. A specific portion of a sample prepared for testing purposes.

(d) *Acceptance.* Written official notification by the Bureau of Mines that a conveyor belt has met satisfactorily the requirements of this part.

(e) *Acceptance marking.* An identifying mark indicating that the conveyor belt has been accepted for listing by the Bureau of Mines as fire-resistant.

§ 34.2 *Scope of this part.* The regulations in this part define the fire-resistant properties, methods of testing to determine such properties, the manner in which samples should be submitted and specimens prepared for tests, and the manufacturer's identification and markings to denote acceptance when the results of tests are satisfactory. Other requirements, such as strength, resistance to wear, and flexibility, are not covered by the regulations in this part.

§ 34.3 *Preliminary consultation.* Manufacturers or their representatives may visit or communicate with the Central Experiment Station, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pennsylvania, to discuss the requirements or regulations in this part in connection with a belt to be submitted for test. No charge is made for such consultation, and no formal report will be submitted to the manufacturer.

§ 34.4 *Application, fee, and sample.*

(a) An application for investigation under this part shall be in duplicate, addressed to the Central Experiment Station, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pennsylvania, and shall include:

(1) Description and specifications of the conveyor belt, which may be supplemented by descriptive literature. Specifications shall include: Trade name of the conveyor belt; thickness of covers; designation of the compounds used in the manufacture of the covers, friction, and skim coats; number of plies; type and weight of ply materials; a designation of breaker strip or floated ply; and any other features deemed significant by the applicant.

(2) A statement that the conveyor belt is completely developed and ready for market.

(3) A statement that the conveyor belt has been subjected to a flame test, the nature of the test, and results obtained.

(4) A request that the necessary tests leading to acceptance be made.

(b) Each application shall be accompanied by a check, draft, or money order, payable to the United States Bureau of Mines, to cover the cost of tests (see § 34.5).

(c) Two samples of the conveyor belt to be tested, each 6-feet long by 9-inches wide and having open edges, shall be delivered without charge to the Central Experiment Station, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pennsylvania. A conveyor belt will not be accepted for testing under this part unless the samples submitted are constructed in the form in which the belt is to be marketed. On receipt of this application, fee, and samples to be tested, the Bureau will act on the application.

§ 34.5 *Fees for testing conveyor belts.*

1. Flame test..... \$15.00
2. Drum-friction test..... 35.00
3. Fees for other tests will be based on the actual cost of testing, as determined by the Bureau, in which case the applicant will be notified and the fees paid before the tests are initiated.

§ 34.6 *Termination of investigation; disposal of fee and material.* Upon request by an applicant that the Bureau terminate its investigation of the conveyor belt, the Bureau will terminate the investigation, and will return to the applicant the fees paid by him, less such portion thereof as the Bureau determines is applicable to the testing already done. The Bureau of Mines may retain as its own property any or all material submitted by the applicant that may be required for record. Any material remaining after termination of tests and not required for record will be available to the applicant and will be returned at his expense on shipping instructions made in writing to the Central Experiment Station, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pennsylvania.

§ 34.7 *Date of tests.* Tests will be made in the order in which samples are received by the Bureau after applications have been filed and accepted; however, not more than three belts will be tested consecutively for any one manufacturer, if applications are on file from other manufacturers. The applicant will be notified of the date on which tests will be started. If a conveyor belt fails to meet any of the requirements set forth

in this part, it shall lose its order of test precedence. Tests will be made on re-submitted samples following completion of other test work which is in progress at the time both the request and the materials for retesting are received. Exceptions to the provisions of this section may be made only for minor tests that may be performed simultaneously with other work in the laboratory.

§ 34.8 *Observers at formal investigations and demonstrations.* No one shall be present during any part of the formal investigation conducted by the Bureau which leads to acceptability except the necessary Government personnel, representatives of the applicant, and such other persons as may be mutually agreed upon by the applicant and the Bureau. Upon accepting a conveyor belt for listing as fire-resistant, the Bureau will announce that such acceptability has been granted and may thereafter conduct from time to time in its discretion public demonstrations of the tests conducted on the accepted conveyor belt. Those who attend any part of the investigation, or any public demonstration, shall be present solely as observers; the conduct of the investigation and of any public demonstration shall be controlled wholly by the Bureau's personnel. Results of chemical analyses of material and all information contained in the drawings, specifications, and instructions shall be deemed confidential and their disclosure will be appropriately safeguarded by the Bureau.

§ 34.9 *Types of tests.* To obtain acceptance under this part a conveyor belt must pass test 1 (Flame Test) and, when in the opinion of the Bureau it is required, test 2 (Drum-Friction Test).

§ 34.10 *Flame test.*—(a) *Size of test specimens.* Specimens of conveyor belts 6 inches long by $\frac{1}{2}$ inch wide by belt thickness shall be cut by Bureau test personnel from the belt sample submitted for testing to provide four test specimens, two of which will be cut parallel to the warp and two of which will be cut parallel to the weft.

(b) *Flame-test apparatus.* The principal parts of the apparatus within and appended to the 21-inch cubical test gallery are:

(1) A support stand with a ring clamp and wire gauze.

(2) A Pittsburgh-Universal Bunsen-type burner (inside diameter of burner

tube 11 mm.), or equivalent, mounted in a burner placement guide in such a manner that the burner may be placed beneath the test specimen, or pulled away from it by an external knob on the front panel of the test gallery.

(3) A variable speed electric fan and an ASME flow nozzle (16–8½ inches reduction) to attain constant air velocities at any speed between 50–500 feet a minute.

(4) An electric timer or hand-operated stopwatch to measure the duration of the tests.

(5) A mirror mounted inside the test gallery to permit the test specimen to be viewed from the back through the viewing door.

(c) *Preparation of test specimen.* The specimen shall be clamped in a support with its longitudinal axis horizontal and its transverse axis inclined at 45° to the horizontal. Under the test specimen shall be clamped a piece of 20-mesh iron-wire gauze, 5 inches square, in a horizontal position $\frac{1}{4}$ inch below the pulley cover edge of the specimen and with about $\frac{1}{2}$ inch of the specimen extending beyond the edge of the gauze.

(d) *Procedure for flame test.* The procedure for flame tests on conveyor belting is as follows:

(1) The support stand, with the test specimen mounted as described above, shall be positioned in the burner placement guide within the flame-test gallery.

(2) The Bunsen burner shall be adjusted to give a blue flame 3 inches in height having a temperature of $1350^{\circ} \pm 50^{\circ}$ F. ($732^{\circ} \pm 28^{\circ}$ C.) when measured by means of a 20 B & S (Brown and Sharpe) gauge, iron-constantan thermocouple, centered in the flame at a point 1 inch above the top of the burner.

(3) The test specimen shall be inserted into the flame at a distance 1 inch above the top of the burner.

(4) The free end of the specimen shall be centered in the flame.

(5) The observation door of the gallery shall be closed for the entire test.

(6) The burner flame shall be applied to the test specimen for 1 minute in still air.

(7) At the end of one minute, the burner flame shall be removed, the ventilating fan turned on to give an air current having a velocity of 300 feet per minute, and the duration of flame measured.

(8) After the test specimen ceases to flame, it shall remain in the air current for at least 3 minutes to determine the presence and duration of afterglow. If a glowing specimen bursts into flame within 3 minutes, the duration of flame shall be added to the duration of flame in subparagraph (7) of this paragraph.

(9) The tests of the four specimens cut from any sample shall not result in either duration of flame exceeding an average of 1 minute after removal of the applied flame or afterglow exceeding an average of 3 minutes' duration.

§ 34.11 *Drum-friction test.* This test shall be applied only to samples which pass the flame test.

(a) *Size of test specimen.* A test specimen 5 feet long by 9 inches wide shall be cut from one of the two samples of conveyor belting submitted.

(b) *Drum-friction test apparatus.* The essential parts of the drum-friction test apparatus are:

(1) A suitable clamp for securing the fixed end of belt sample in test position and an adjustable weight clamp for the free end.

(2) Means for measuring accurately the temperature at specified points of the belt sample under test.

(3) Electric drive motor of at least 15 horsepower.

(4) Positive drive to maintain drum speed of 110 ± 10 r. p. m.

(5) Drive pulley of at least 18 inches in diameter.

(6) Where drive pulleys in excess of 13 inches in width are used, insulation shall be provided for the portion of the face in excess of 13 inches and the ends of the drum to reduce heat loss. The test specimen shall cover approximately 180° of the exposed drum surface in test position.

(7) Scales, to be installed in the fixed clamp when tension measurement is desired.

(8) Multiple jets of compressed air, issuing from $\frac{1}{16}$ -inch-diameter holes on $\frac{1}{2}$ -inch centers along the top of a $\frac{1}{2}$ -inch pipe of the same length as the drum, to maintain an air velocity of 300 feet per minute at the surface of the drum.

(c) *Preparation of test specimen.* Two steel clamps, 12 inches long by 2 inches wide by $\frac{1}{2}$ inch thick, shall be bolted onto the specimen approximately 1 inch from each end. One clamp, called the fixed clamp, is fitted with a chain

and hook arrangement, while the other clamp, called the weight clamp, contains two rods to which weight bars may be attached. At three points along the specimen from the fixed clamp, $\frac{1}{8}$ -inch holes shall be drilled into the edge of the belt to provide openings for thermocouples with which to measure belt temperatures. Two of these holes shall be at the point of tangency when the specimen is lapped over the conveyor driving drum, and the third shall be placed halfway between these points. The holes shall be drilled to a depth of 2 inches between the first and second ply from the pulley cover, or a similar position in case of solid woven belts. The specimen shall be placed over the conveyor driving drum; the hook fastened to a steel I-beam or other rigid support, secured to the floor beneath the drum; thermocouples inserted into the holes in the side of the belt; an additional thermocouple shall be inserted in the center of the carrying cover of the belt at a point midway between the thermocouples at the points of tangency; and the proper weights adjusted at the weight clamp.

(d) *Procedure for drum-friction test.* The procedure for the drum-friction test is as follows:

(1) During the entire test a current of air having a velocity of 300 feet per minute shall be maintained at the drum and belt.

(2) With the specimen in the position described heretofore, the drum shall be revolved for a period of 120 minutes.

(3) Weights shall be attached to the weight clamp at the following time intervals:

Duration of test (cumulative)	Weight added (pounds)	Total weight on belt (pounds)
First 15 minutes.....	50
15 to 30 minutes.....	25	75
30 to 45 minutes.....	25	100
45 to 60 pounds.....	30	130
60 to 75 minutes.....	35	165
75 to 90 minutes.....	35	200
90 to 105 minutes.....	35	235
105 to 120 minutes.....	35	270

(4) Temperature readings shall be recorded at intervals of not more than 10 minutes throughout the test.

(5) A specimen that is destroyed during the test without signs of flame or glow, or that does not develop a temperature of 482° F. (250° C.) at any

thermocouple during the 2-hour period, shall be considered fire-resistant.

(6) A specimen shall not be considered fire-resistant if any flame appears on the belt during a test.

(7) When glow is evident at the conclusion of a test, the glowing specimen shall be subjected to an air stream for 3 minutes. If the specimen bursts into flame within this time, or continues to glow beyond this time, it shall not be considered fire-resistant.

§ 34.12 *Changing details of tests.*

The Bureau may modify the details of the tests prescribed by these regulations provided that the information obtained and the degree of safety are not substantially affected. The applicant will be notified of any changes that the Bureau deems advisable.

§ 34.13 *Notification of acceptance or rejection.*

(a) After the Bureau has considered the results of the tests, a formal written notification of acceptance or rejection of the conveyor belt for listing will be supplied to the applicant by the Bureau. If the conveyor belt meets all requirements of this part, the notification will not be accompanied by test data or detailed results of tests. If the conveyor belt fails to meet any of the requirements of this part, the notification will be accompanied by details of the failure, with a view to possible remedy of the defect or defects in conveyor belts submitted in the future. Except for such notification to the applicant, results of tests of conveyor belts that fail to meet the requirements will not be made public by the Bureau.

(b) The Bureau will not give verbal reports concerning the investigations, or conduct informal tests, or grant informal acceptances.

§ 34.14 *Acceptance markings.* With formal notification of acceptance, the applicant will receive written permission to designate, as "fire-resistant," conveyor belts of the same type and composition as the specimen that passed the test.

(a) *Marking.* Conveyor belts accepted by the Bureau of Mines as fire-resistant shall be marked as follows: Metal stencils furnished by the manufacturer shall be used during the vulcanizing process to produce letters depressed into the conveyor belt with the words Fire-Resistant, U. S. B. M. No. -----

This number will be assigned to the manufacturer after the sample has passed the tests. The letters and numbers shall be at least $\frac{1}{2}$ inch high.

(b) *Position of markings.* The acceptance markings shall be placed approximately 1 inch from the edge of the carrying (top) cover of the conveyor belt and spaced at intervals not exceeding 30 feet for the entire length of the conveyor belt. The markings shall be so placed that they are alternately at opposite edges of the belt.

§ 34.15 *Manufacturer's obligation.* A manufacturer who has obtained the Bureau's permission to place acceptance markings on conveyor belts manufactured by him is obligated to maintain the fire-resistant quality of his product and to have each conveyor belt so marked manufactured strictly according to the records that have been accepted and placed on file by the Bureau for that conveyor belt. Conveyor belts that have been accepted as fire-resistant by the Bureau of Mines but subsequently have been altered in design or composition without Bureau authorization, and belts that have not been accepted a fire-resistant by the Bureau of Mines, must not bear the Bureau's acceptance marking.

§ 34.16 *Changes subsequent to acceptance.*

The manufacturer may obtain the Bureau's authorization for modifying the specifications of a conveyor belt that has been tested and accepted, by letter to the Central Experiment Station, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pennsylvania, requesting an extension of the original acceptance and stating the change or changes desired. The letter shall be accompanied by revised specifications showing the proposed changes in detail. If the Bureau determines that tests are unnecessary, the Bureau will formally advise the manufacturer of the acceptance or rejection of the proposed change. If the Bureau determines that tests are necessary, the Bureau will advise the manufacturer as to the fee and material required.

§ 34.17 *Withdrawal of acceptance.* The Bureau may rescind for cause, at any time, any acceptance granted under the regulations in this part.