

BELT EVALUATION LABORATORY TEST (BELT)

by

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OVERVIEW

- ❖ *TIME LINE – 1989-2002 -- BELT TEST PROGRAM and RULEMAKING*
- ❖ *MID-SCALE TEST DEVELOPMENT*
- ❖ *VOLUNTARY BELT TEST PROGRAM*
- ❖ *RESULTS OF THE BELT TEST PROGRAM*
- ❖ *CONCURRENT-SUBSEQUENT RULEMAKING*

BELT TEST PROGRAM SUMMARY

- ❖ Large-scale fire tests made over a range of air flows
- ❖ Obtained & evaluated fire test data from large & small-scale tests
- ❖ BuMines developed a new mid-scale test for fire-resistant conveyor belts

Development of Mid-scale Test

- **Scaling of the test**
- **Type, strength, location of the ignition source**
- **Size and location of the test sample**
- **Airflow conditions**
- **Material properties of the test apparatus**

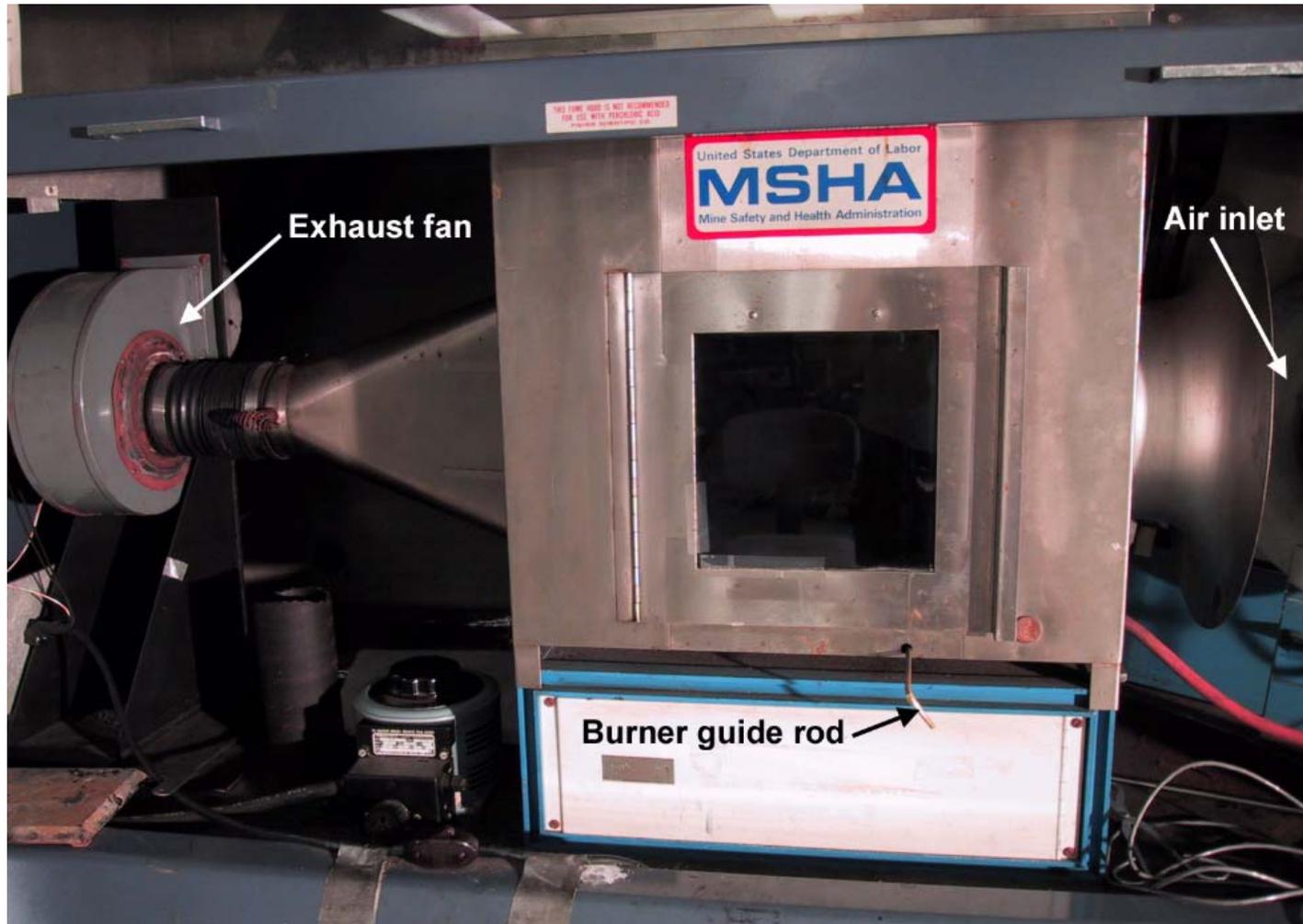
Mid-scale Fire Test

- ✓ Provide comparable results with large-scale tests
- ✓ Be easy to construct
- ✓ Be simple to operate
- ✓ Be repeatable
- ✓ Be cost effective

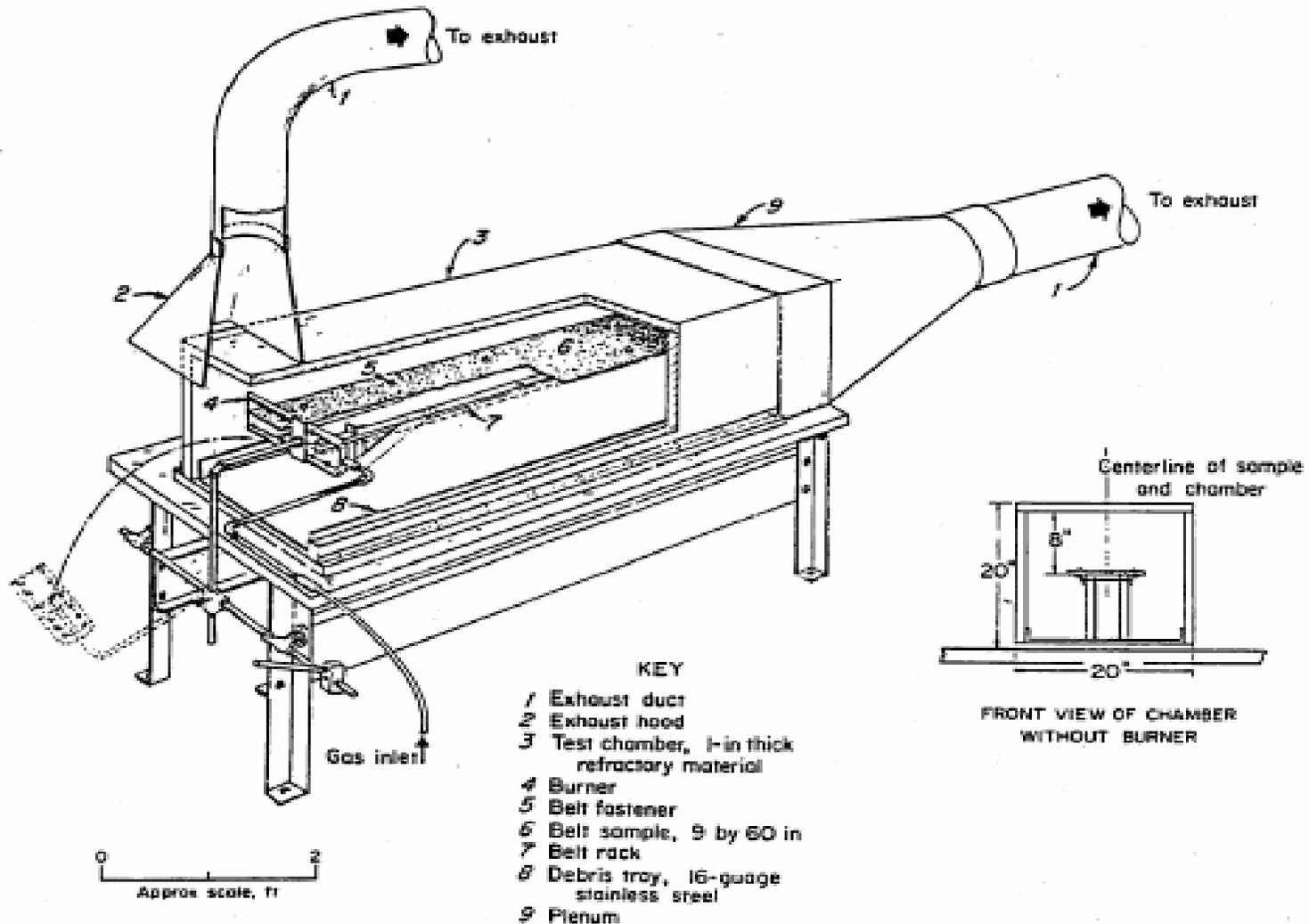
Time line--1989

- ✓ Public meeting at MSHA, A&CC, Jan. 19, 1989
- ✓ Discussed MSHA-BuMines large & small-scale belt flammability test work
- ✓ Presented MSHA's future plans for conveyor belt testing (vol. prgm.) & rulemaking

MSHA 18.65 BELT FLAME TEST



BELT EVALUATION LAB TEST (BELT)



VOLUNTARY BELT TEST PROGRAM

- Instituted a test program at the MSHA A&CC—first test made on February 8, 1989
- Large variety of belt constructions from manufacturers were tested using the new belt evaluation laboratory test (aka BELT)
- No charge was made by A&CC for the tests

VOLUNTARY BELT TEST PROGRAM

- A large database was obtained on belt constructions that passed and failed the BELT
- The data was provided to each participating company and also incorporated into the rulemaking record

BELT Apparatus

- **Test chamber is 6 feet long by 1-1/2 foot square with exhaust transition section**
- **Natural gas jet burner is used for the igniting source**
- **Steel rack used to hold the belt test sample in the tunnel**

BELT Apparatus

- ❖ The belt test sample is 9 inches wide by 5 feet long
- ❖ Air flow through the tunnel is set at 200 ft./min.
- ❖ Natural gas jet burner for ignition is 5 minutes

BELT—Test Criteria

Criteria for pass/fail were developed for the BELT as follows—

- ✓ A belt passes if in 3 test trials there remains a portion of the 5 foot sample length that is undamaged across its width**
- ✓ A belt fails the test if in any of the 3 test trials fire damage extends to the end of the 5 foot sample length**

BELT Apparatus



BELT - Apparatus



BELT – Sample Holder



BELT-Test Sample



Ignition Burner Flame



Ignition of Conveyor Belt



Belt Ignited & Burning



Belt propagating flame



Remnants of Conveyor Belt



BELT – Burned Damage to Samples



Summary

BELT-Flame Test Data

- ✓ Started 2-8-89 Ended 5-26-94
- ✓ 21 belt companies & a chemical company participated
- ✓ Data obtained on over 700 individual flammability tests

Class of Belt

Rubber & Composites

PVC

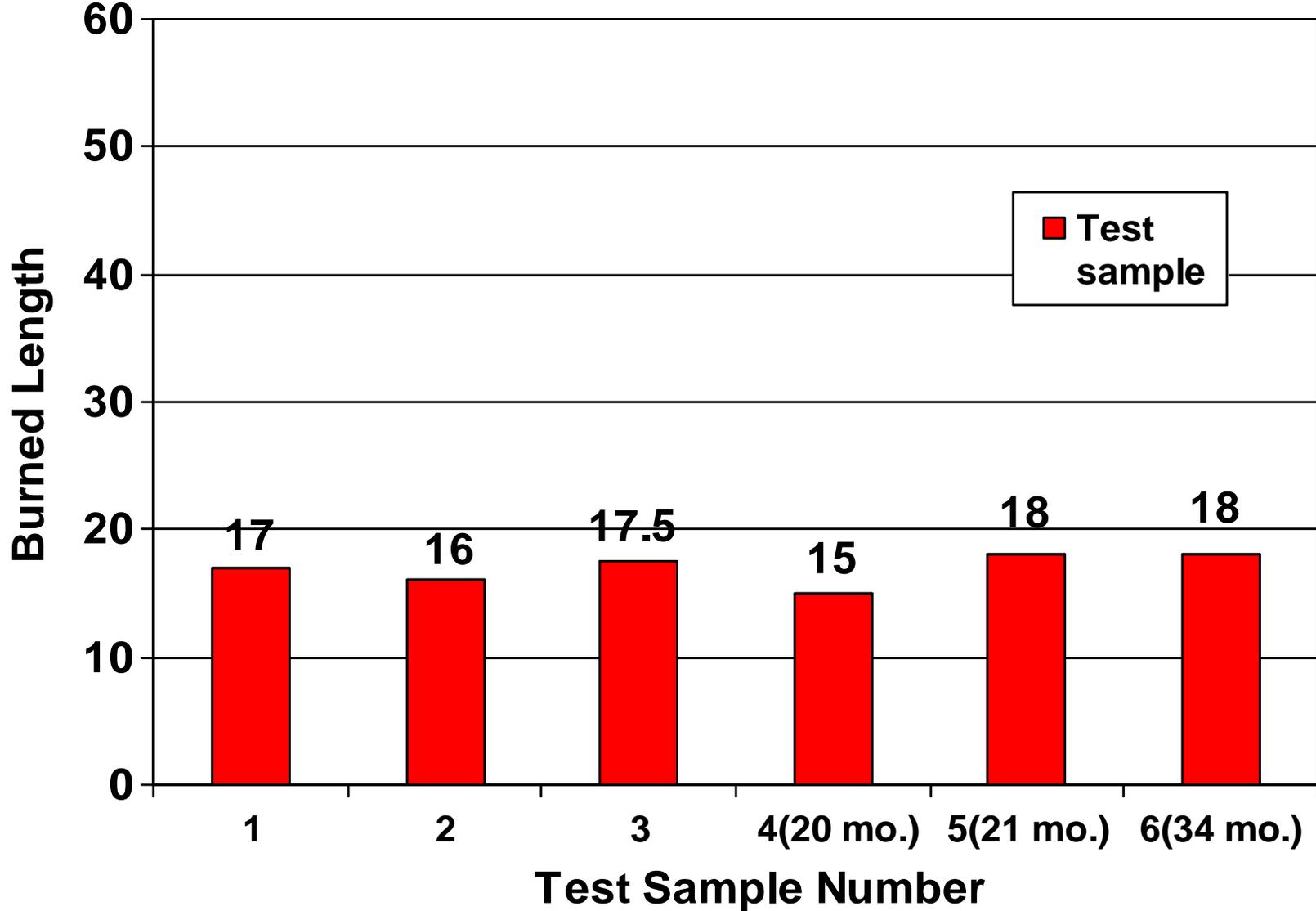
Number that Passed

95

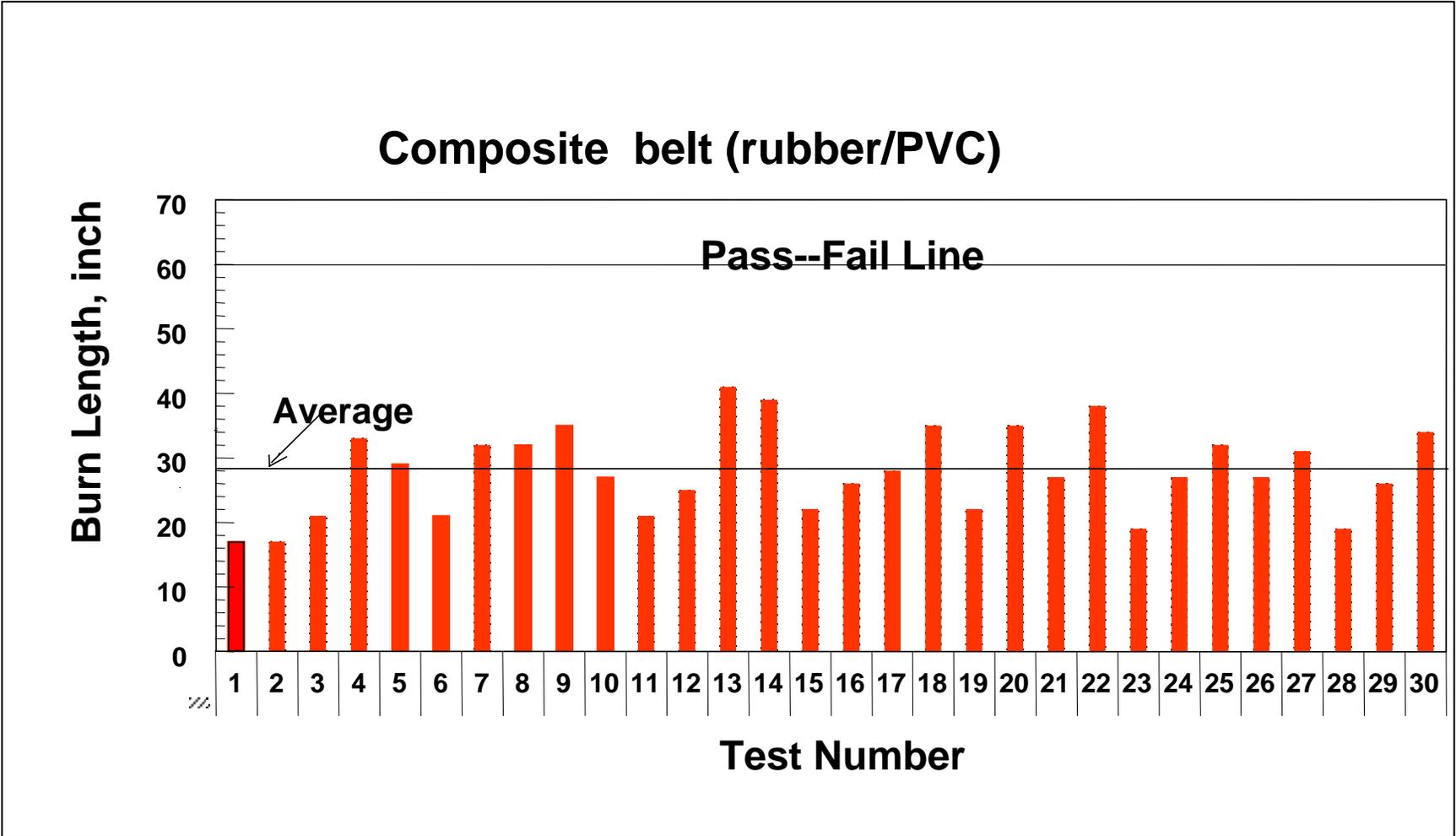
38

Total = 133

Cloroprene BELT Data



BELT – 30 REPEAT TESTS



BELT Rulemaking

- **Rulemaking was initiated concurrently with the voluntary belt test program in 1989**
- **MSHA proposed a rule for testing & approval of flame-resistant conveyor belts in the Federal Register, Dec. 24, 1992**
- **Comment period extended to March 26, 1993**

Belt Test Rulemaking

- **Record reopened March 31, 1995 and a public hearing held on May 2, 1995, on the conveyor belt test**
- **Record closed on June 5, 1995, reopened on Oct. 31, 1995, and record closed again on Feb. 5, 1996**
- **Record reopened Dec. 28, 1999, and closed Feb. 28, 2000**

Proposed Rule Withdrawal

- **BELT in final rule stage as shown in Semi-annual Regulatory Agenda, May 13, 2002**
- **In Federal Register notice of July 15, 2002, MSHA withdrew the proposed rule for the new conveyor belt test (BELT)**
- **No further rulemaking activity with the BELT has taken place**

Questions?

