Test Report

ITS Intertek Testing Services

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REPORT OF A

STANDARD FLAME SPREAD TEST PROGRAM

CONDUCTED ON

MOLECULAR SIEVE DESICCANT COATED CORRUGATED ALUMINUM FOIL

CLIENT

DESICCANT ROTORS INTERNATIONAL
A DIVISION OF ARTIC INDIA ENGINEERING
ARTIC INDIA HOUSE
20 RAJPUR ROAD
DELHI 110054
INDIA

REPORT PREPARED BY

INTERTEK TESTING SERVICES NA LTD.
WARNOCK HERSEY
211 SCHOOLHOUSE STREET
COQUITLAM, B.C.
V3K 4X9

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PREFACE

This report describes the tests, standards and details for the samples of molecular sieve desiccant coated corrugated aluminum foil submitted by Desiccant Rotors International.

This report does not automatically imply product certification. Products must bear WHI labels in order to demonstrate ITS/Warnock Hersey certification.

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INTRODUCTION

On February 10, 1999, the Fire Laboratories Division of ITS/Warnock Hersey conducted an exploratory test program to determine the surface burning characteristics of molecular sieve desiccant coated corrugated aluminum foil. The material tested was selected and submitted by Desiccant Rotors International.

Testing was conducted in accordance with NFPA 255 and ASTM E84-95 *Standard Test Method for Surface Burning Characteristics of Materials* to determine conformance to the requirements of NFPA 90A *Standard for the Installation of Air Conditioning and Ventilating Systems.*

Upon receipt of the samples at the ITS/Warnock Hersey laboratory they were placed in the conditioning room where they remained in an atmosphere of 23 $\pm$ 3°C (73.4 $\pm$ 5°F) and 50 $\pm$ 5% relative humidity until they reached a constant weight.

One trial run was conducted on the sample.

MATERIAL SPECIFICATIONS

The material tested was selected, prepared and submitted by the client. It consisted of a single roll of aluminum foil 15-1/2 in. in width with a desiccant coating on both sides. The corrugated aluminum foil has an approximate thickness of 0.004 in. including the coating.

SAMPLE MOUNTING

The coated aluminum foil was supported along the entire length of the upper ledge of the tunnel using 1/4 in. steel rods spaced at 12 in. on centres. A 6 mm layer of asbestos cement board was then placed over top, in accordance with ASTM E-84 and NFPA 255.

TEST PROCEDURE

The results of the tests are expressed by indexes which compare the characteristics of the sample under tests relative to that of select grade red oak flooring and asbestos-cement board.

(A) FLAME SPREAD CLASSIFICATION:

This index relates to the rate of progression of a flame along a sample in the 25 foot tunnel.

A natural gas flame is applied to the front of the sample at the start of the test and drawn along the sample by a draft kept constant for the duration of the test.

An observer notes the progression of the flame front relative to time. This information is plotted on a graph (flame spread curve).

The test apparatus is calibrated such that the flame spread classification for red oak flooring is 100, and 0 for asbestos-cement board.

CALCULATIONS: ASTM E84-95

According to the test standard, the flame spread classification is equal to $\frac{4900}{(195 - A_t)}$ when

A_t is the total area beneath the flame spread curve, if this area exceeds 97.5 minute feet.

If the area beneath the curve is less than or equal to 97.5 minute feet the classification becomes $0.515 \times A_t$.

TEST PROCEDURE (Continued)

(B) SMOKE DEVELOPED:

A photocell is used to measure the amount of light which is obscured by the smoke passing down the tunnel duct.

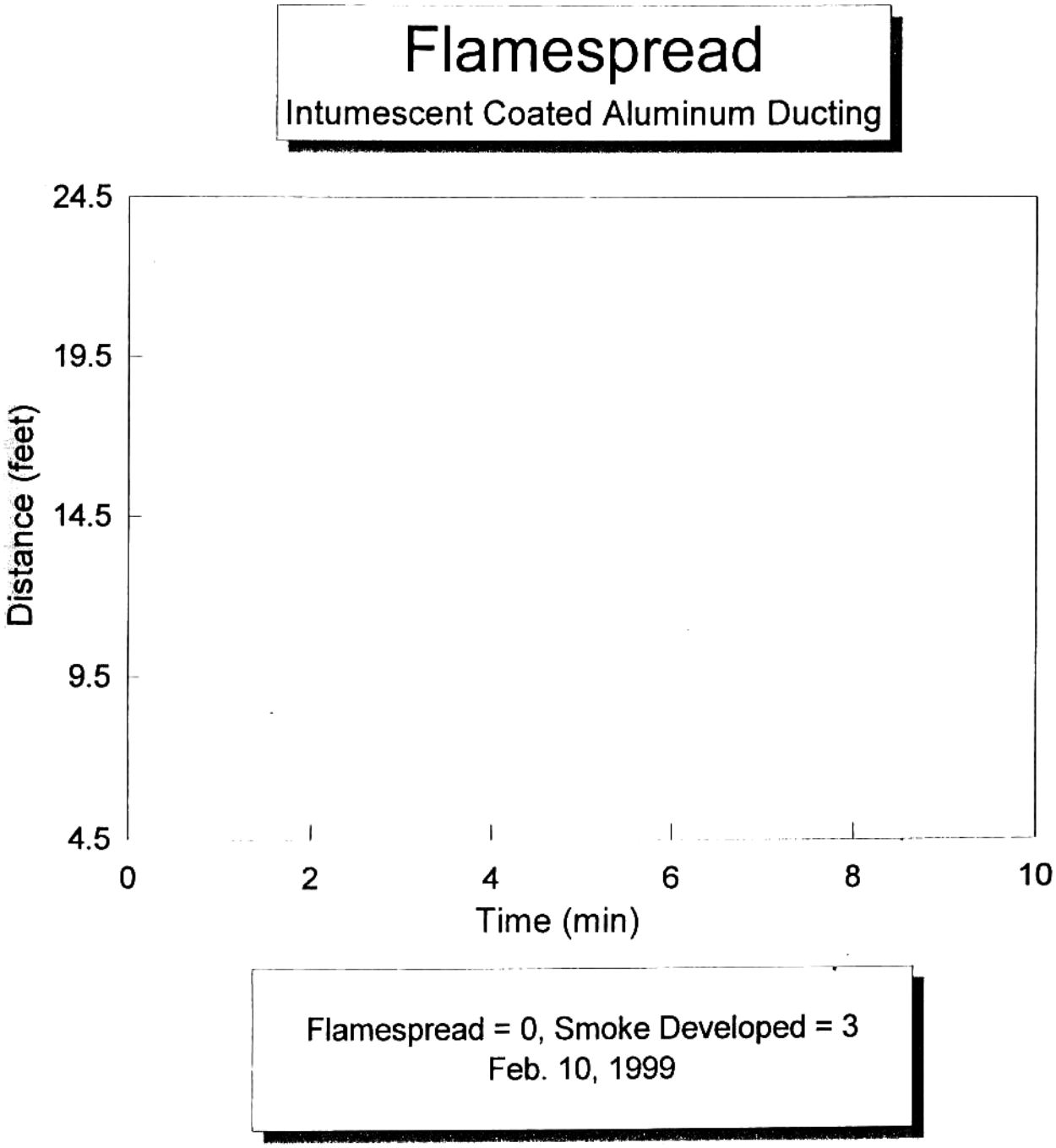
When the smoke from a burning sample obscures the light beam, the output from the photocell decreases. This decrease with time is recorded and compared to the results obtained for red oak which is 100.

CALCULATIONS:

$$\frac{10{,}000 - (\text{smoke integrator reading}) \times 100}{3356} = \text{smoke developed}$$

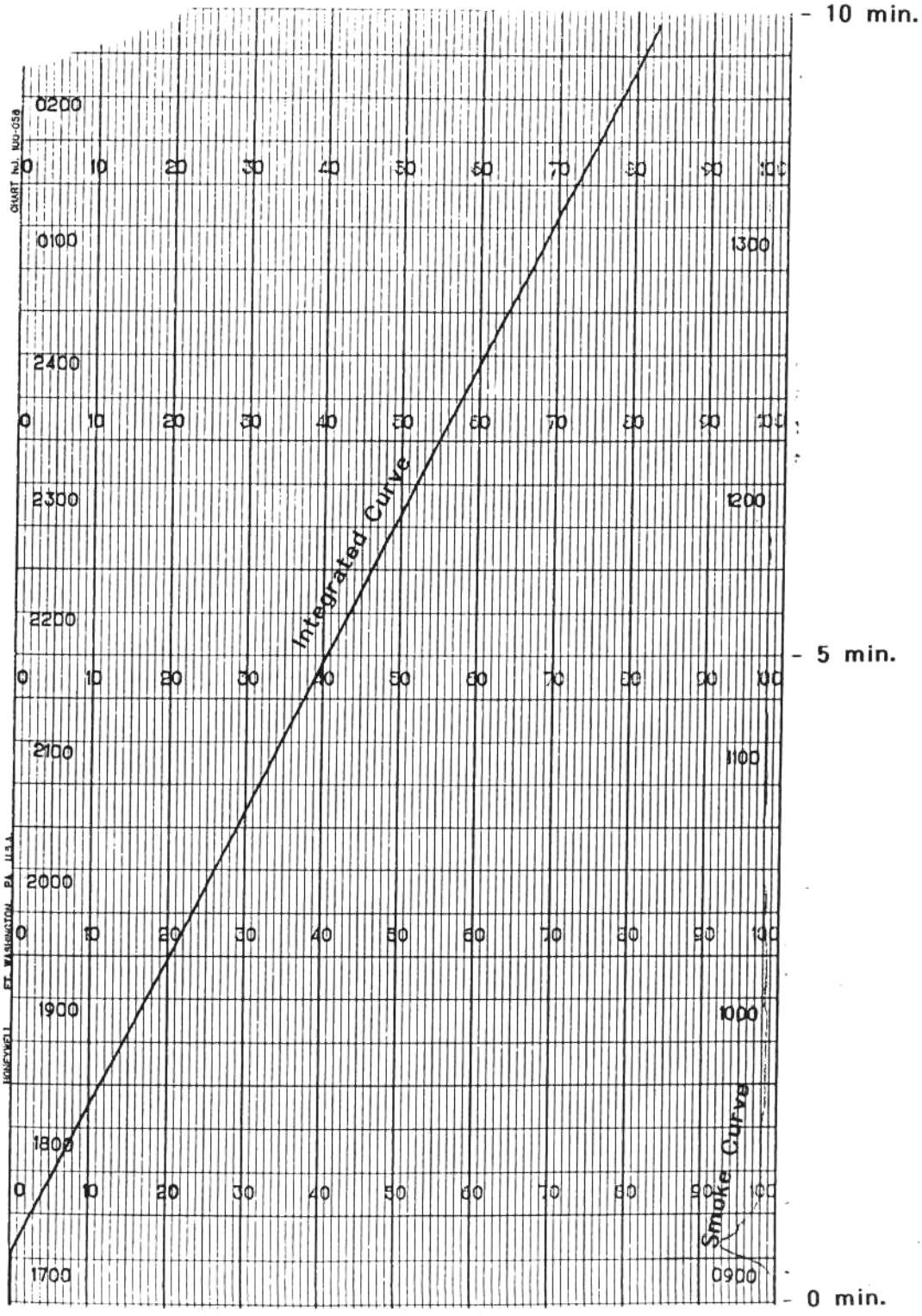
FLAME SPREAD
DISTANCE IN FEET VS. TIME IN MINUTES

RUN 1



SMOKE DEVELOPED CURVE

RUN 1



TEST RESULTS

FLAME SPREAD

The resultant flame spread classifications are as follows:
(rounded to nearest 5)

Molecular Sieve Desiccant Coated Corrugated Aluminum Foil	Flame Spread	Flame Spread Classification
Run 1	0	0

SMOKE DEVELOPED

The areas beneath the smoke developed curve and the related classifications are as follows:
(rounded to nearest 5)

Molecular Sieve Desiccant Coated Corrugated Aluminum Foil	Smoke Developed	Smoked Developed Classification
Run 1	3	5

CONCLUSIONS

The sample of molecular sieve desiccant coated corrugated aluminum foil submitted by Desiccant Rotors International exhibited the following flame spread characteristics, when tested in accordance with NFPA 255 and ASTM E84-95 *Standard Test Method for Surface Burning Characteristics of Materials*.

Sample	Flame Spread Classification	Smoke Developed Classification
Molecular Sieve Desiccant Coated Corrugated Aluminum Foil	0	5

The NFPA 90A standard provides the following requirements for this product:

> **2-3.3.1 Supplementary Materials for Air Distribution Systems.**
> **2-3.3.1** Supplementary materials such as duct coverings, duct linings, vapor retarder facings, adhesives, fasteners, tapes and core materials added to air ducts, plenums, panels and duct silencers used in duct systems shall have, in the form in which they are used, a maximum flame spread index of 25 without evidence of continued progressive combustion and a maximum smoke developed index of 50. Where air duct coverings and linings are to be applied with adhesives, they shall be tested with such adhesives applied, or the adhesives used shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when in the final dry state.

The material tested, therefore, met the requirements of NFPA 90A.

INTERTEK TESTING SERVICES NA LTD.
Warnock Hersey

Tested and Reported by:
Paul Saunier
Technologist
Fire Laboratory

Reviewed by:
Michael van Geyn, A.Sc.T.
Manager
Fire Laboratory

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