Ministry of the Interior, Institute for

Fire- and Civil Defence

Research Centre

1033 Bp. Laktanya u.33



Examination of fire retardant material with the trade

name: Tree Safe, for decreasing combustion of Christ-

mas-trees, for interior using.

**1.** Combustion and inf1ammation examinations **of Christmas-trees**

treated with Tree Safe fire retardant material.

- the examination of the efficiency of primary application of

Tree Safe happened on the 25th October 1993, in the premises of

Dunamenti Fire Protection



There have been used for the examinations 2 pc approx. 1,5 -1,7

meter high trees, cutted down in September.

The treatment with the protective agent happened in a few days after cutting down with a bottle supplied with a spray head, in­tended for commercial make-up, consuming 0,5 liter solution.

'I'he treatment was done by the employees of the Company on the man­ner descripted in the directions of use, namely the solution would been sprayed on the tree with the spraying head of the bottle in that manner, that the branches should been moistened steadily but not to be forced drops of the fluid.

The storage of the treated and untreated samples occured in a dry,

approx. 15 C thermal conditioned hall

Description of the done tests:

A./ We tried to inflammate treated and untreated Christmastrees,

with the help of a candle fixed on a branch of the tree, mo­delled this way one of the supposible cases of combustion.

The candles has been positioned on both trees so, that over the

**candles** there **was a m**eeting point **of smaller branches of the tree.**

The behaviour of the treated tree

because of the burning candle

of the untreated tree

There was observable after 15 sec some

mild smoking, the branch deviated in the­

direction of the flame, the small

surrounded the flame, but there was no con- /After 30 sec we observed inten-

* 

was sparkling burning to be observed, without flames.



minutes the sample/

,

sitv

smoke-formation, after

is aflamed for appr. **5. m**in. and in spite of /110 seconds the burnedup branch

present firing source burned itself out /felt down / *it was*  carbonized/

adjusted to the f Lame again,but the combustion of the whole tree doesn’t happened

wasn't rised self-supporting combustion./

so the candlelight moved off

There was not observed falling off brand or/ the branches. The before a1-

glowing pine-needle under the tree. No com-/ready heated branch would be

bustion after 45 minutes .

a ll .After

9.5

D./ The last test was setting light



2



out further tests with a candlelight hold under a

treebranch until 10 minutes.

In the case of the treated branch there was observed after 2 minutes

carbonizing, but after then wasn't formed neither brand nor falling

down sprinkling nieces.

In the case of the untreated pine we observed bursting flashes, which have extinguished the flames. Between 2 and 4 minutes there was no

flaming but stronger smoke f'orming , like by the treated tree. After 4 min 44 sec the heated branch fLamed up, and after a few seconds

the flaming stopped.

It is observable, that as long as by the treated tree after taking away the flame there was no glowing and after further 2 minutes you can touch the carbonized surface, in the case of the untreated tree after taking away the flame there remained glowing branchpieces, and smokeforming.

Remark: the tested trees doesn't become into the growing condition characteristic the Christmas period, their cutting d own happened in the phase of the development. There has been a lot of fresh, juicy sproutson the branches, their drying out is a slower progression. That gives the reason to been unsuccessful the setting into fire of the whole tree.

lightingtests would been repeated with FB gasflame.

*B* e h a v i 0 u r

O f t h e

treated tree

untreated tree

The branch came after 15 sec-s

Under a I6 sec influence of gaslight

into glowing. Restrainedly sprink- flaming, sprinkling burning

ling burning. The glowing pieces

42 sec. doesn't extended to other parts

Doesn’t fall down. After l-minute





more intensive smoke forming like on,

The pine -needles burnt down in

the treated tree, under the tree gath­ered burned up or carbonized branch-

the area of the flame. The whole tree

and the branches outside the flame pieces and pine-needles. doesn't combusted, The whole period







the a.m. trees.

This branches has been substantial drier, the pine needles peeled off the branches 0f the untreated tree. The treated branches has been a little

 bit greener and -the peeling off the needles was smaller.

The lighting

 was done as well as by the first test with a candle.

o F



T r e a ted branch

with a bottle supplied with a, spraying head, intended for c ommercial

pine plates/ would been sprayed 1 - 2 - 3 times with Tree Safe,

1± 0,05 gr

Summarizing of t he received results shown In the next chart :

The flame has been hold on to

several points of the branch

. / .

B E H A V I 0 U R

untreated branch

because of the candlelight the branch

 burst into flames. within 1 minute

3 minutes long. W*e* have obser-

*the w*hole branch was aflamed. After

gone out after taking away the

2 minutes burned to ashes, glowing branch pieces remained.

ved local combustions, which

flame

By the test “D” was the difference between the treated and untreated

sample

* appeared from the influence of the protecting material

perfectly stringent.

and Qualification

2./ Examination of the efficiency of delaying of fire on the basis

of the Lindner method /Hungarian Standard 3607/1-1983/ with “Tree­ Safe II /Trade-name/ material.

Notwithstanding that the application area of Tree Safe burn delaying material especially the moderation of burning of Christmas-trees is,

and for using interior, we have besides the a.m. examinations

based on observations performed with the material other tests, prescribed by the Hungarian Standard 9607/1-1983, for firedelaying materials, as follows:

The applications guide referring to the application of Tree Safe doesn't determine numerically the quantity to be conveyed to the surface of

the protective material, it gives only an estimated date as: approx.

0,5 liter for a l,5 m high tree, which quantity is suitable for the required application

Therefore samples to be tested /100x100x10mm

make-Up. /The second and the third spraying respectively have been

done after drying the former layer/.



done

according

to the



The mass of the pastilles

for

Burning /hexametilen-tetramin/was

In case of appropriate

- the pine-wood will not be incombustible in consequence of influence of the protective materia1, but it's behaviour against the lighting source will be significantly more advantageous like of the untrea­ted ones.

1.2.

3.

4.

5.

6.

7.

8.

9.

lQ. - 3,10 g

==============~======================================================

|  |  |  |
| --- | --- | --- |
| 1  | -  | 3.  |
| 4-  | -  | **6.**  |
| *7*  | *-* | '9  |

|  |  |  |  |
| --- | --- | --- | --- |
| 1  | times  | Treated s | samples  |
| 2  | times  | treated  | samples  |
| ;  | 3times  | treated  | samples  |
| /  |

the flaming stops.

4-

€ contents of protective material

Loss of mass, measured after burning

No.

1,155g 1,72 g

1,091 1,58 g

 1,84 g

0,396 g 2,32 g

0,582 g' 1,61 g

 1,93 g

 1,96 g

 1,92 g

 2,29 g



0,731 g



10. untreated samples

Knowing the results it can be established, as follows:

- increasing of contents of protective material has as a result the decrease in loss of mass by the sample

- already a simple coating decreases approximately to *2/3* the loss of mass *I* content of protective agent is approx. 35 *g/m2/*

- we could with 3 spraying about 100 *g/m2 ±* 15% convey up the surface, and the sample sheets treated this way could come close to the 1,5 g highest value, allowed by the Hungarian Standard 9607/1, for loss

of mass by wooden materials supplied with surface protection.

Summarized the observations in connection to the examinations for

Tree Safe protective material, it is to be determined, t hat a. m. protective material

- slow up the drying out the cuttenout'pines and their pine-needles

- decreases the inflammability against the lighting source

- significantly decreases the forming of smoke and brand by initial

fires

- depending on the degree of humidity of the treated pine-trees inhi -

bits or Slows up the expanding of fire

* after taking away the lighting source

content of protective material

Budapest, the 1st November 1993.

The examinations performed and this material assembled by

/Attila Szabo lieutenant of

Firebrigades/

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- examined as a woodprotective material on surface it shows definite­ly burning delaying effects.

- the observed loss of mass in consequence of burning is proportionate

 to the quantity of the conveyed protective material.

Regarding the above written data, and on the base the available docu-

mentations we recommend the handing out of the agreement of the Natio­nal Commandment with the stipulation, that the material can not be

applied for common wood-protective purposes, as burndelaying material

for wood and wood substituting materials with reference to this eXaminations.

With the trade name “Tree Safe”, for decreasing combustion of Chrismas trees, for interior using.

burning /gramms/

1,239 1,312

**8.**

**9.**

1,309

3,08

7 – 9:

10:

Ministry of the Interior

Research Institute for Fire-

and Civil Defence

1033 Budapest, Laktanya utca 33 No: 33/37/1/1993

Amendment to the matter of examination of fire retardant material

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1.Examination and qualification of the efficiency of delaying of fire

on the basis of the Lindner method /HS9607/1-1983/ with Tree Safe

Trade name/ material

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To complete the measuring data given the 33/37-1933 test report

 *We m*ake known following results, concerning the application of Tree Safe as surface protecting material.

The surface of the tested samples /lOOxlOOxlO mm pine sheets/ wouId been sprayed over with Tree Safe /with the help of a bottle supplied w ith a spraying head, planned for commercial use/ three, four and five times respectively /the next spraying happened after the drying of the sheet before/.

Furthermore the preparing of the samles happened according to the prescriptions of the HS /HungarianStandard/ 9607/1.

The mass of the pastilles for burning /hexamethilen-tetramin/ was 1 ± 0,05 g.

The obtained results are summarized in the next chart:

 No ,

*€* Contents of protecting material/gramms/

**Loss of maSS, measured after**

1.

0,303 1,102

0,990

1,94 1,91

1,95

1,66

1,38

1,41

**2.**

3.

4.

5.

6.

7.

0,974

1,228 1,479

1,51

1,48

1,81

10. -

1 - 3:

|  |  |  |  |
| --- | --- | --- | --- |
| 3  | times  | treated | sample s  |
| ,  |  times  | treated  | samples  |
|  4 |
| 5 |  times | **treated**  | samples  |
| /  | t i ne s  |



untreated samples

*/*

2

Knowing the results it can to be established as follows:

\_ increasing of contents of protective material has as a result the decrease in loss of mass by the sample

- in the case of the samples 5 **- 8.** we have sprayed over the surface over 120 g/m2 protecting material and the measured loss of mass of the sample sheets treated this way satisfies the allowed by the



1,5 g max. loss

of mass for wood treated with surface

protection.



The examination performed and this material assambled by

/Attila Szabo lieutenant of firebrigades/