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Plastatech Engineering Ltd
Report No. PA-07-042 Part 2

The Resistance of PVC for Roofing to Fungi and Algae after 1573 Hours QUV-A Exposure

INTRODUCTION

Plastatech Engineering submitted five pieces of PVC roofing for evaluation of resistance of surface fungal growth and the cyanobacteria (algae), *Oscillatoria species*. The samples are reported to contain Vinyzene™ (DCOIT*) and competitive biocides including OBPA** as a positive control. The samples were reported to have been exposed to 1573 hours of QUV-A artificial weathering lights.

The samples were labeled al follows:

- B3.1
- B3.2
- B3.3
- B3.4
- T Membrane

SUMMARY

All the samples were not resistant to surface fungal growth except the T-membrane. All the samples were not resistant to algae growth.

RESULTS

The procedures are described in the appendix.

SAMPLE	ASTM G-21 FUNGAL GROWTH	ASTM G-29 ALGAL GROWTH
B3.1	HG	HG
B3.2	HG	HG
B3.3	HG	TG
B3.4	HG	HG
T MEMBRANE	NG	Vinyl- TG Embossed- TG

RESULTS

The procedures are described in the appendix.

Sample	ASTM G-21 Fungal Growth	ASTM G-29 Algal Growth
B3.1	NG	MG
B3.2	HG	LG
B3.3	NG	MG
B3.4	LG	TG
T MEMBRANE (LIGHT)	NG - (BOTH SIDES)	Embossed Side- LG Vinyl Side- NG
T MEMBRANE (DARK)	NG - (BOTH SIDES)	-

Note: Photographs of the fungal test are enclosed.

APPENDIX

ASTM G-21-96

Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

The samples were placed on (non-nutrient) mineral salts agar and inoculated with a mixed fungal spore suspension of:

Aspergillus niger	ATCC 9642
Penicillium pinophilium	ATCC 11797
Chaetomium globosum	ATCC 6205
Aureobasidium pullulans	ATCC 15233
Gliocladium virens	ATCC 9645

After 28 days incubation at 28°C, antifungal activity was evaluated by visually rating the degree of fungal growth on the samples.

Surface fungal growth is rated by the following scale:

No Growth	(NG)
Traces of Growth (less than 10% coverage)	(TG)
Light Growth (10 to 30% coverage)	(LG)
Medium Growth (30 to 60% coverage)	(MG)
Heavy Growth (60% to complete coverage)	(HG)

ASTM Rating

0 = No Growth
1 = Traces of Growth
2 = Light Growth
3 = Medium Growth
4 = Heavy Growth

APPENDIX

ASTM G-29-96

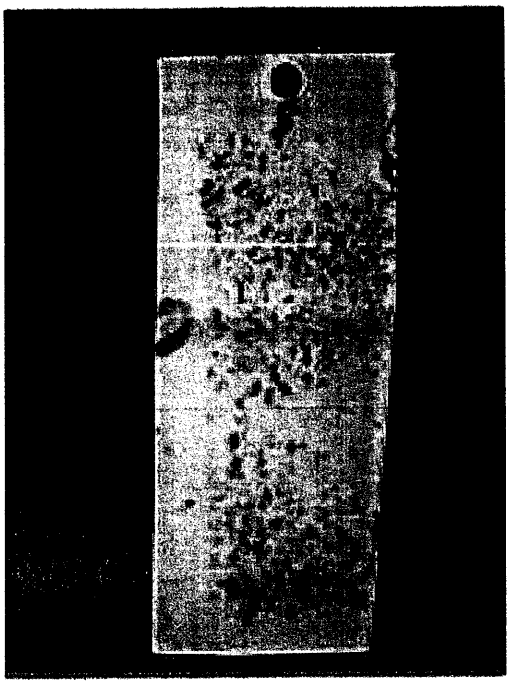
Standard Practice for Determining Algal Resistance of Plastic Films

The samples are suspended in jars and inoculated with a suspension of the alga: *Oscillatoria sp.* The jars are filled with a diluted salts solution and illuminated by four 20 watt "cool light" fluorescent bulbs for 12 hours each day. At three day intervals, a fresh inoculum of algae is added to each sample jar. After 14 days at room temperature, the samples are removed and examined for adherent algal growth.

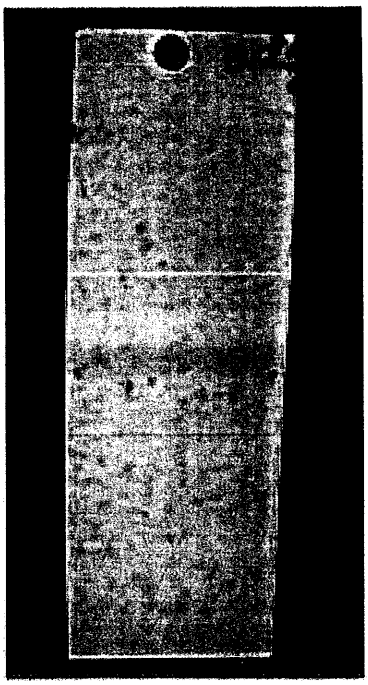
Surface algae growth is rated by the following scale:

No Growth	(NG)
Traces of Growth (less than 10% coverage)	(TG)
Light Growth (10 to 30% coverage)	(LG)
Medium Growth (30 to 60% coverage)	(MG)
Heavy Growth (60% to complete coverage)	(HG)

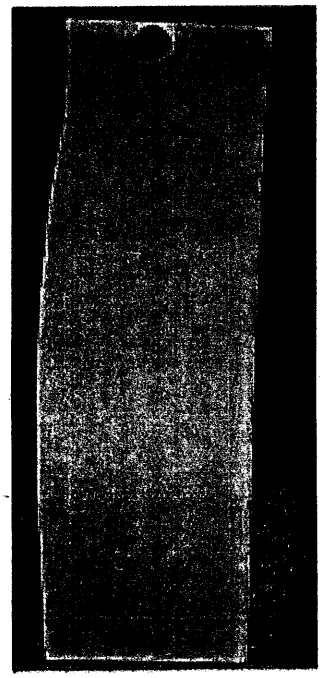
TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-29
B3.1



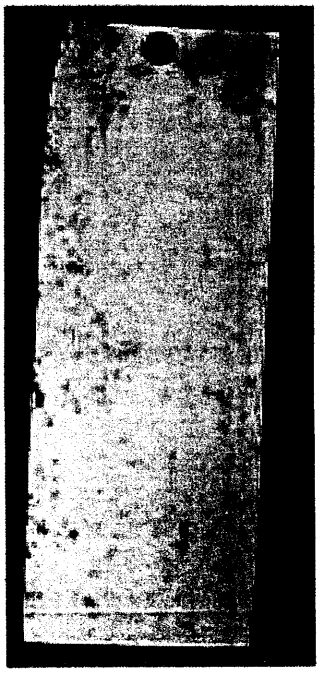
TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-29
B3.2



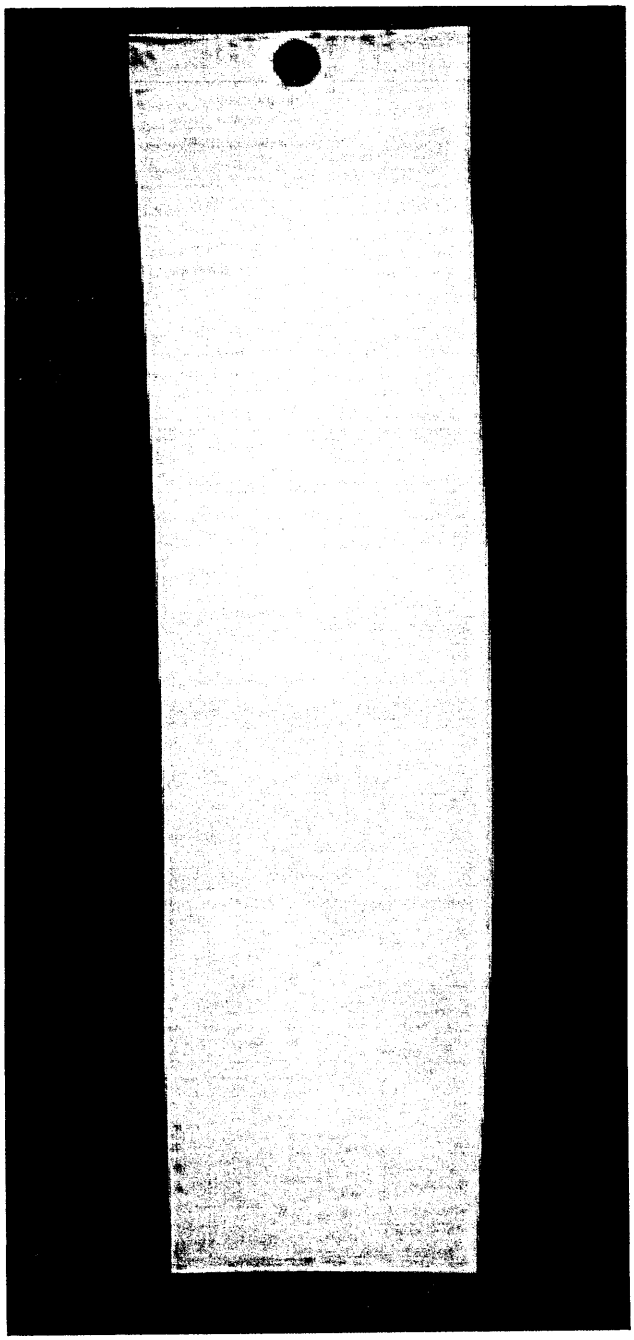
TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-29
B3.3



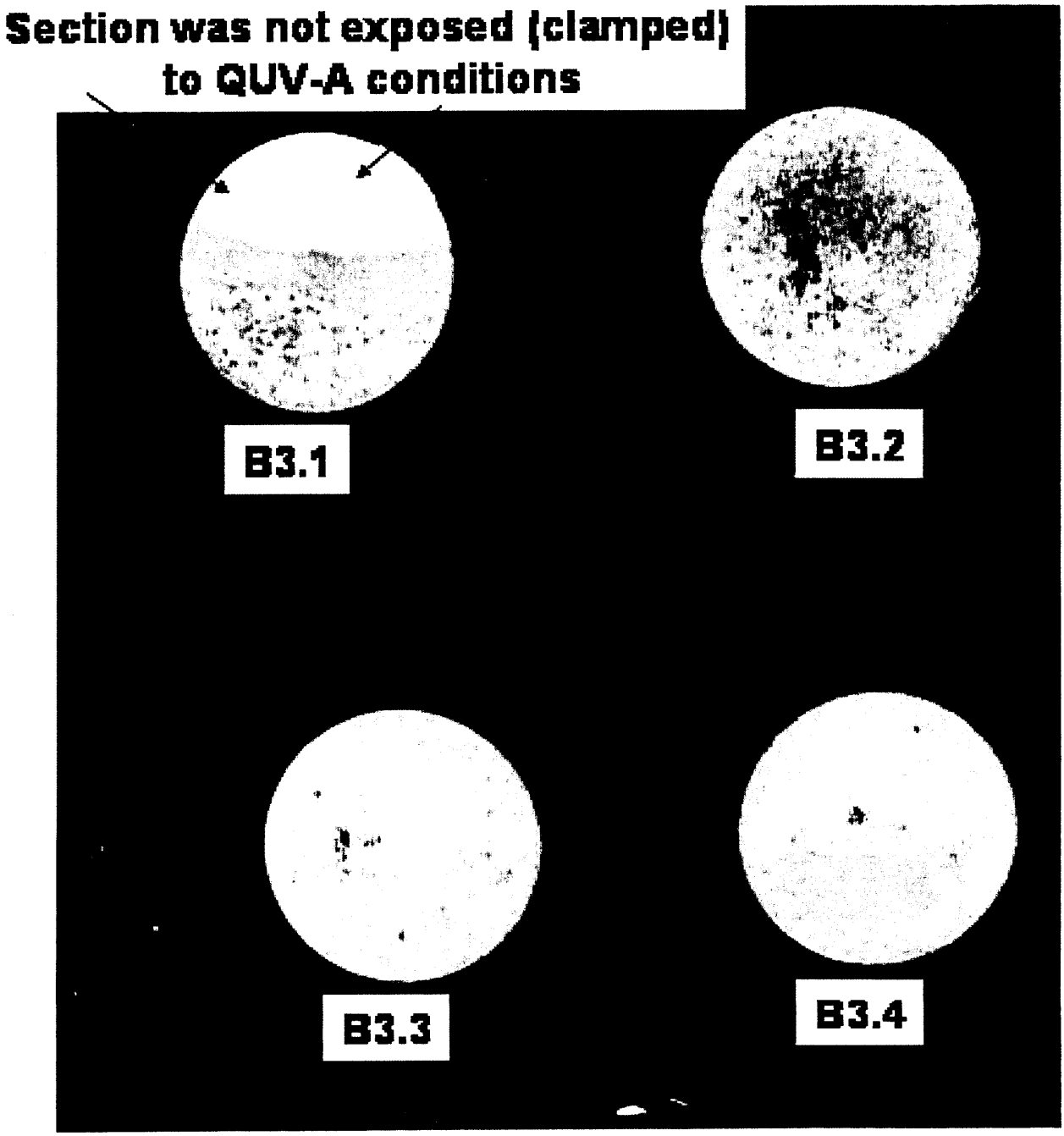
TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-29
B3.4



TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-29
T-MEMBRANE



TEST NO. 07-042 PART 2
AFTER 1573 HOURS QUV-A EXPOSURE
ASTM G-21



TEST NO. 07-042 PART 2

AFTER 1573 HOURS QUV-A EXPOSURE

ASTM G-21

T-MEMBRANE