

**EFFECT OF ETHYLENE-VINYL ACETATE AND  
POLYVINYL CHLORIDE RATIO ON  
MICROCELLULAR SHEETS**

A dissertation submitted to the  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University  
In partial fulfillment of the requirements  
for the award of  
Bachelor of Science in Palm & Latex Technology  
and Value Addition

By

**KASUNI NISHARA SEWWANDI  
EKANAYAKE**

**Palm & Latex Technology and Value Addition Degree  
Programme**

**Faculty of Animal Science and Export Agriculture**

**Uva Wellassa University of Sri Lanka**

**2021**

## ABSTRACT

Polymer blending is a significant technique that used in industrial practices to obtain desirable properties which cannot be achieved by an individual material. Component polymers and their mixing ratios affect greatly on the properties of the final product. Ethylene Vinyl Acetate (EVA) and Poly Vinyl Chloride (PVC) are most popular polymer materials in industrial applications. Hence, this study aspired to explore the effect of EVA and PVC ratio on physical properties of EVA microcellular sheets. . Five samples of EVA microcellular sheets were prepared with different EVA: PVC ratios (95:5, 90:10, 85:15, 80: 20, 75:25). Sample prepared with EVA alone was used as the control. Then all samples were cured at 120°C for seven minutes. Hardness, specific gravity, compression set, abrasion resistance and flexibility of these six samples were tested as per standard test procedures. This experiment was conducted in triplicate. Data were subjected to Analysis of Variance and mean comparison by turkey comparison test using Minitab statistical software 16.0 version. The EVA microcellular sheets prepared with EVA: PVC ratio of 80:20 was found be the best in terms of all the tested properties and its hardness, specific gravity, compression set, abrasion resistance and flexibility tests were 43.66 N mm<sup>-2</sup> with 0.577 of standard deviation(SD), 0.224 kg m<sup>-3</sup> (SD-0.002) , 65% (SD-1.00), 933.7 mg mm<sup>-3</sup>(SD-50.30) and more than 30000 cycles respectively. In conclusion, blending of EVA and PVC at the ratio of 80:20 respectively can be recommended for manufacturing EVA microcellular sheets with improved properties. Further studies are needed to investigate the effect of polymer blending ratio on mechanical and morphological behavior of EVA microcellular sheets.

**Key words:** Ethylene-Vinyl Acetate, Polyvinyl Chloride, Polymer ratio, Microcellular sheets