

Laboratory Manual

on **WOOD**
PROPERTIES

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CONTENTS

<i>Personal Details</i>	vii
<i>List of Plates</i>	ix
<i>Preface</i>	xi
WOOD PHYSICAL	
Laboratory 1 : Determination of Moisture Content in Solid Wood	1
Laboratory 2 : Determination of Wood Density and Specific Gravity using Measurement and Water Displacement	7
Laboratory 3 : Determination of Shrinkage and Swelling of Solid Wood	13
WOOD CHEMISTRY	
Laboratory 4 : Determination of Moisture Content in Sawdust	19
Laboratory 5 : Determination of Cold Water Solubility of Wood	25
Laboratory 6 : Determination of Hot Water Solubility of Wood	31
Laboratory 7 : Determination of 1% NaOH Solubility of Wood	37
Laboratory 8 : Determination of Ash Content in Wood	43
Laboratory 9 : Determination of Alcohol-Toluene Solubility of Wood	49
Laboratory 10 : Determination of Lignin Content in Wood	55
Laboratory 11 : Determination of Holocellulose in Wood	61
Laboratory 12 : Determination of Alpha-Cellulose in Wood	67
WOOD MECHANICAL	
Laboratory 13 : Determination of Bending Strength Properties of Wood	73
<i>References</i>	79

PREFACE

LABORATORY MANUAL OF WOOD PROPERTIES is designed for use by pre-diploma, diploma and degree students. The narrative section of the manual can be used as a reference manual for research and development purposes by post-graduate and others who are interested to test the various properties of bio-based material. The knowledge captured in the manual provides the testing technique based on or modified to follow closely Technical Association of the Pulp and Paper Industry (TAPPI) protocols.

The tests covered in this manual can be separated into physical, chemical and mechanical tests on bio-based material. The tests include (i) physical – moisture content, density and specific gravity also shrinkage and swelling; (ii) chemical – extractives content, holocellulose, alpha-cellulose, lignin and ash content, and (iii) mechanical – bending. The manual provides narrative and pictorial guides deemed necessary for understanding these basic testing requirements of bio-based materials. The combination of physical, chemical and mechanical properties would enhance the understanding of bio-based material for use in laboratory exercises (quality) and research and development as well as production control.

LABORATORY 1

Determination of Moisture Content in Solid Wood

Moisture content of wood is an important parameter leading to different ways of drying and processing wood. Each species has different moisture content depending, on among others the anatomical structure, composition, age and portions of the wood.

OBJECTIVES

To determine the moisture content of solid wood using an oven-drying method.

PROCEDURE

(1) Conventional Oven-drieding method:

Cut three small sample blocks (refer to Plate 1.1) of wood with dimension of 20 mm × 20 mm × 20 mm from any species of solid wood. Immediately weigh the samples on a scale with a precision of 0.1% of the weight of the sample (a 500 g electronic scale with a precision of 0.1 g is ideal for weighing the samples). Record the weight of each sample as the initial weight (*I*) in Table 1.1.

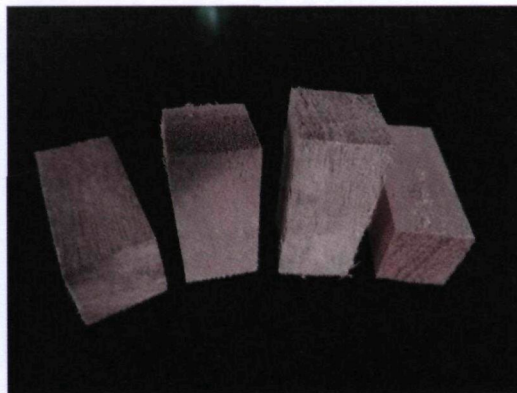


Plate 1.1: Wood Cubes