**Sudan University of Science and Technology**

**College of Graduate Studies**

**Department of plastic engineering**

# Comparison Between Wood Plastic Composites(WPCs) And Woods

# مقارنه ما بين تراكيب الخشب البلاستيكي والأخشاب

**A thesis submitted in partial fulfillment of the requirement of the degree of M.Sc. in plastic Engineering**

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# Dedication

During pass out of time, there are always special moments for each person. It's always nice to share that moment with those who mean a lot to us, those who give my life a meaning. To them I dedicate this simple work.

Tomy beloved mother heavens of love

To my beloved dad who teach me patience in life

To my beloved husband who make my life wonderful

To my peace of sole, my babies god bless them for me

To my beloved sisters lake of joy

To my beloved brothers wind of eagerness

To my beloved friends flower of happiness

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# Abstract

Composites can be defined as materials that consist of two or more chemically and physically different phases separated by a distinct interface. The different systems are combined judiciously to achieve a system with more useful structural or functional properties non attainable by any of the constituent alone.

This new materials are becoming an essential part of today's materials due to the advantages such as low weight, corrosion resistance, high fatigue strength, and faster assembly. They are extensively used as materials in making aircraft structures, electronic packaging to medical equipment, and space vehicle to home building like wood plastic composites.

In this research we take a sample of wood plastic composites from moawia's factory in Khartoum north and other samples are different types of wood to compare between them and define what is the best type of wood which gives a good mechanical properties by using tests like density, absorption test, hardness test, impact test and fire test. The tests where carried in Sudan university of science and technology.

We found after making many experiment tests that the WPCs are resistance to water (absorption percentage 0.034% ) ,the density of it is 0.68g/cm$^3$ ,hardness of it is 0.21 ,the impact of it is 1.24 and the burning test show that its good fire retardant 0.333 min .So the wood plastic composites are the best for using in different application. The musky is best one to use in compounding.

# مستلخص الدراسة

الخلطات تعرف بانها مواد مكونه من مادتين او اكثر مختلفتين كيميائيا و فيزيائيا و يوجد فاصل بينهما. في الانظمه المختلفه لعمليات الخلط يتم الخلط بحكمه لتحقيق نظام مع خصائص هيكليه او وظيفيه اكثر فائده وغير قابل للتحقيق من قبل اي من المواد المؤسسه لوحدها.

ه\ه المواد الجديده (الخلطات) اصبحت جزءا اساسيا اليوم بسسب المزايا مثل انخفاض الوزن, مقاومه التاكل,قدره عاليه علي تحمل الاجهادات وقابليه التشكيل بسهوله. حيث انها تستخدم علي نطاق واسع جدا مثلا في صناعه هياكل الطائرات , التغليف الالكتروني, بناء المنازل ,الاثاثات المنزليه وغيرها. مثل مركب الخشب البلاستيكي.

في ه\ا البحث تم اخ\ عينه من الخشب البلاستيكي من مصنع معاويه للاثاثات بالخرطوم بحري وعيانات اخري لانواع مختلفه من الخشب لإجراء مقارنه بين الخصائص الميكانيكيه للخشب البلاستيكي و الخشب العادي , وايضا تحديد اي نوع من الخشب هو الأفضل للإستخدام في صناعه الخشب البلاستيكي ليعطي افضل خواص ميكانيكيه مثل الكثافه, مقاومه امتصاص الماء, الصلاده, الصلابه والحريق. ولقد تم إجراء الإختبارات في جامعه السودان للعلوم والتكنولجيا في قسم الميكانيكا والمدنيه.

وبعد إجراء التجارب عدة مرات وجد أن الحشب البلاستيكي مقاوم للماء جيث نسبة الإمتصاص 0.034%, والكثافه 0.68جم/سم3, والصلابه 0.21, والصلاده 1.24 واختبار الحريق اكد بانه مقاوم جيد للنار حيث انه ينطفي بعد اشتعاله بي زمن قصير 0.333 دقيقه.

وب\الك يعتبر مادة جيد جدا للاستحدام بي مختلف الأشكال. وأفضل نوع خشب لخلطه مع البلاستيك هو خشب الموسكي وخصوصا نشارة الخشب.

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