Tshwane University of Technology
We empower people

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT
Department of Chemical, Metallurgical and Materials Engineering
(Polymer Technology Division)
Recycled Plastics Chair
Competition Day – 4 August 2017

1. INTRODUCTION

Fabrication of a chair that is used outdoors made from recycled polymer materials.

2. ASSIGNMENT

You are required to:

- Make a uniquely designed outdoor chair that is able to carry a minimum weight of 60kg. The chair does not necessarily need to have legs, but needs to lift the person sitting on it off the ground.
- Provide a detailed sketch of the design of the chair.
- Submit a report containing a list of the recycled materials (look at the recycled code on the product) used together with the process followed to prepare the materials and a method of the chair is assembled.
- Design a chair that is esthetically pleasing (decorations) to the eye.

3. MATERIALS

- You may only use plastic, rubber and paper materials that come from products that have been used as packaging materials.
- Polymer glue or metals (i.e. staples, wiring) can be used to bond/join the materials together. No other materials, such as wood, may be used.

4. OBJECTIVE

- To construct an outdoor chair that is made entirely of recycled plastic packaging material that is able to hold a person of minimum weight of 60 kg.
- A scaled model needs to be built before the competition day and a written technical report detailing the manufacturing processes from start to finish. Make sure to also pay attention to safety procedures.

5. LEARNING OBJECTIVES

The learner will be able to:

- Gain familiarity and understanding polymer materials and their properties.
- Research, analyse, design and implement understanding on polymers result in a useful product.
- Showcase a union between creative design with structural and mechanical integrity.
- Appreciate the socio-economic impact of reusing and recycling polymer materials.
- Work effectively as a member of a team.

6. PROCEDURE

- You will come up with a design and construct the chair prior to the competition day.
- You will also prepare a written technical report detailing the full range of properties of the materials and design which must be submitted on the day of the competition, together with the model.

- Give an oral presentation of your prototype.

7. TIME

Each team will have a maximum of **five minutes** to give a verbal explanation the chosen design, with the aid of their constructed model. Each member will also be asked questions for which points will be awarded.

8. TEAMS

A maximum of **three learners** per group will be allowed to participate.

9. EVALUATION

The team will be evaluated on the following:

- A unique design and description of the material used for the chair (Aesthetic component will play a part of this evaluation) . [5]
- The content of the report submitted, detailing properties, procedure and design. [5]
- The questions asked by the evaluators. [5]

Total [15]

CONTACT DETAILS

Dr Caroline Khoathane (Section Head: Polymer Division) or Ms Elaine Relling
Tel: (012) 382 3604/9
Email: khoathanec@tut.ac.za

APPENDIX

Use search engine www.google.com. Type your search keywords and click on the images link in the left top corner of your screen to find pictures for some unique chairs.