

بسم الله الرحمن الرحيم

Sudan University of Science and Technology



College of Engineering



School of Mechanical Engineering

Production Engineering Department

Research Title:

**Study method of manufacturing water
bottles**

Prepared By:

1. Almohtde Abody Mahmmoud Hassan
2. Moayed Omer El-Tayeb Mahmmoud
3. Rami Salah Nasur Mohammedden

Supervised By:

Mr. Jafar Abd-Alhamid

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التجريد:

يهدف هذا البحث إلى تصميم قالب لإنتاج قوارير المياه ذات حجم 500 مل ونوع البلاستيك المستخدم في تصنيعها (بولي إيثيلين تيرفتاليت).

تم اختيار مقاسات القالب القياسية تم تحديد المادة المستخدم فيها والعملية المستخدمة في ذلك عملية القوالب بالنفخ.

ايضاً تم التطرق في كيفية استخدام الحاسوب والبرامج المصممة خصيصاً والملائمة لرسم وتطبيق القالب وأجزائه.

Abstract:

This research aims to design a template to produce water bottles with volume of (500 ml) and the type of plastic used in the manufacturing pet . size was selected according to standard template all the parts and dimensions were identified.

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Table of symbols

T_g	Glass transition temperature
T_c	Crystallization temperature
T_m	Melting temperature
I.V	Intrinsic viscosity
ϵ_x	Thermal strain on horizontal axis
ϵ_y	Thermal strain on perpendicular axis
ϵ_z	Thermal strain on angular axis
ΔT	The difference between temperature degrees
σ	Thermal stress
σ_c	Compressive stress
E	Young modulus
α	Coefficient thermal expansion
V	Passion ratio
ϵ_{22}	Axial stress
ϵ_{11}	Lateral stress
λ	Failure rate
A	Constant depends on die material for HDS (1-2.5)
Ea	Activation energy for particular failure mechanism(0.5-1.2)
T	Temperature in Kelvin
K	Boltzmann constant (8.63* .00001)
λ_1	Failure rate at test temperature
λ_{22}	Failure rate at used temperature
Lc	Cooling temperature
h	Plate thickness
A_w	Mold wall temperature
te	Ejection temperature

Chapter One

1-1 introduction:

Plastic industerlization has become developmentaly and broadly the curcial industry, perhaps, because the plastic ability to reshape and easy to be manufactured, also its available which mean uncostly in manufacturing process.

Making dies to produce very complex part can be achieved through the different molding types, which can not be achieved by other manufacturing methods, nevertheless, designing dies according to standard specification will result in economically and industrially self-satisfaction.

1-2 project Importance:

We live in increasingly globalized world in which the production and manufacturing of plastic are taking place in broad application , the manufacturing of plastic bottles and their molds is not applicable in our society and by designing our mold we will accomplish necessary part in satisfying the society economically and industrially .

1-3 project problem:

We have replaced the material of mould which was stainless steel with hot die steel which is a combination of several elements for better mechanical and thermal properties, and changed volume to 500 ml as it will be explained in the following chapters.

1-4 project Objectives:

Die design to produce water's bottles for specific specification.

1-5 methodology:

- Collecting data across visiting factories, relative ministries (PEPSI, PESIGHANOS) .
- Drawing die's dimensions according to specification.
- Part assembly.

Applying geometric design to die parts.