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Evaluvation Of Mechanical Properties Of Hybrid Composite Material Made Of E-Waste Aluminium

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Abstract
Electronic waste commonly known as e-scrap and e- waste, is the trash we generate from surplus broken and absolute electronic devices. Electronic waste or e-waste may be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television and refrigerators. This includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal as well as re-usable (working and repairable electronics) and secondary scraps (copper, steel, plastic, etc.). The term "waste" is reserved for residue or material which is dumped by the buyer rather than recycled, including residue from reuse and recycling operations, because loads of surplus electronics are frequently commingled (good, recyclable, and non-recyclable). Several public policy advocates apply the term "e-waste" and "e-scrap" broadly to all surplus electronics. Cathode ray tubes are considered one of the hardest types to recycle.

FIG 1.1E-WASTE1

Electronic waste, or e-waste, is a term for electronic products that have become unwanted, non-working or obsolete, and have essentially reached the end of their useful life. Because technology advances at such a high rate, many electronic devices become "trash" after a few short years of use. In fact, whole categories of old electronic items contribute to e-waste such as VCR being replaced by DVD players, and DVD players being replaced by blue-ray players. E-waste is created from anything electronic: computers, TVs, monitors, cell phones, CD players, fax machines, printers, etc.

PROCESS OF E-WASTE RECYCLING

Non-metallic and metallic components separation. The sixth step is the separation of metals and non-metallic components. Copper, aluminum, and brass are separated from the debris to only leave behind non-metallic materials. The metals are either sold as raw materials or re-used for fresh manufacture.

Plastic

All the plastic materials retrieved are sent to recycle who use them to manufacture items such as fence posts, plastic sleepers, plastic trays, vineyard stakes, and equipment holders or insulators among other plastic products.

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Scrap metals materials retrieved are sent to recycle to manufacture new steel and other metallic materials

Heat Sinks

In electronic systems, a heat sink is a passive heat exchange that cools a device by dissipating heat into the surrounding medium. In computers, heat sinks are used to cool the PCB. Heat sinks are used with high-power semiconductor devices such as power transistors and optoelectronics such lasers and light emitting diodes (LEDs), wherethe heat dissipation ability of the baSiC device is insufficient to moderate its temperature.

Glass

Glass is retrieved from the Cathode Ray Tubes (CRTs) mostly found in televisions and computer monitors. Extracting glass for recycling from CRTs is a more complicated task since CRTs are composed of several hazardous materials. Lead is the most dangerous and can adversely harm human health and the environment. Tubes in big CRT monitors can contain high levels of lead of up to 4 kilograms. Other toxic metals such as barium and phosphor are also contained in CRT tubes **RECOVER METALS FROM E-WASTE**

Shredding

It is a process which is generally referred to as mechanical recycling of E-waste where the used electronic materials are shredded with help of specialized equipment. Once the E-waste is shredded, the individual materials are separated by using Eddy currents and magnetic fields or with help of novel technology like vertical vibration separation.It is one of the latest techniques that are considered to be very effective for separation of metals like copper and iron from plastics. The metallic portion will

Chassis is the main support structure of the vehicle which is also known as 'Frame'. It bears all the stresses on the vehicle in both static and dynamic conditions. In a vehicle, it is analogous to the skeleton in living organisms.Every vehicle whether it is a two-wheeler or a car or a truck has a chassis-frame.

- Chassis Components
- Steering and Suspension Knuckles.
- Engine Cradles and Mounts.
- Axle Housings and Covers.
- Driveline Components.
- Transmission Mounts

A vehicle with out body is called Chassis. The components of the vehicle like Power plant, Transmission System, Axles, Wheels and Tyres, Suspension, Controlling Systems like Braking, Steering etc., and also electrical system parts are mounted on the Chassis frame.

CHASSIS MATERIAL

The material used to construct vehicle chassis and frames is carbon steel; or aluminum alloys to achieve a more light-weight construction. Al-SiCmatrix are also used in chassis construction. In the case of a separate chassis, the frame is made up of structural elements called the rails or beams

ENGINE FRONT PANEL

The engine front cover has close tolerances and special care has to be taken while designing the grippers in order to keep the surface finish, tolerances as-is while handling the covers. Fine Handling's solutions, designed to meet all the specifications of engine front covers in your process, have proved of great help in improving productivity, achieving cycle time while reducing the effort required.The engine front panels are also usually made up of aluminium alloys or Al-SiC. The engine front panels are subjected to cover and to protect the engine from varying force and loads. Therefore the engine front panel material should have higher load impact

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resistivity.

Fig 1.2 Engine front panel

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enough space to install mechanical and electrical parts.Accordingly, it is necessary to create extra housings on the chassisin order to fit in the mechanical and electrical parts. Moreover,space frame is difficult to be manufactured because it is made outof many parts that are assembled togetheFor the development of this innovative approach, the parametric design method was chosen, in order for the design to be modified easily. The chassis efficiency, interms of high strength in low mass, was obtained by following appropriate design steps and rules which conform to the vehicle structural and dynamical constraints and by choosing the composite material. Additionally, a method that calculates the mechanical properties of the composite material is presented. Furthermore, a model has been created, which calculates automatically the total loads applied on the vehicle's chassis.

MATERIALS

Three materials have been used in thiscomposites. They areBASE METAL- ALUMINIUM(extracted from e- waste)

FIG 3.1 Aluminum extracted from e waste

The matrix material used in the experiment was an aluminum alloy , whose chemical composition is given below

CERAMICS –

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Turning is the removal of metal from the outer diameter of a rotating cylindrical workpiece. Turning is used to reduce the diameter of the workpiece, usually to a specified dimension, and to produce a smooth finish on the metal. Often the workpiece will be turned so that adjacent sections have different diameters.

Insert the workpiece in the 3-jaw chuck and tighten down the jaws until they just start to grip the workpiece. Rotate the workpiece to ensure that it is seated evenly and to dislodge any chips or grit on the surface that might keep it from seating evenly. You want the workpiece to be as parallel as possible with the center line of the lathe. Imagine an exaggerated example where the workpiece is skewed at a angle in the chuck and you can easily visualize why this is important. Tighten the chuck using each of the three chuck key positions to ensure a tight and even grip.

4.2.1.1 FACING

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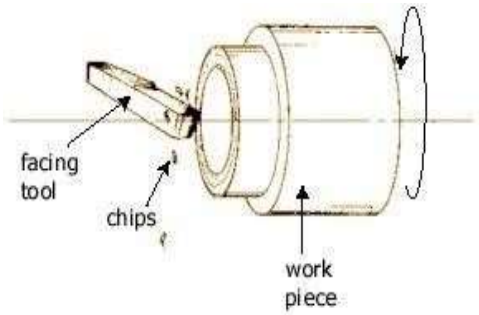

FIG 4.5 Facing

Facing is the process of removing metal from the end of

CONCLUSION

The amount of E-waste production is globally challenged. In this work the new metal matrix composite was developed by using e-waste aluminium collected from different electronic devices. The E-waste contains most valuable metals, non-metals and other particles. The e-waste materials are not recycled properly in the industry during any heating process the E-waste are produces the toxic gasses it was dangerous to the living things. Now the project work focused a innovative think the e-waste materials are added with composite with selected reinforcements for useful work. The e-waste aluminium is used in this as a matrix materials adding with selected reinforcements such as magnesium oxide and silicon carbide with various weight fraction was successfully fabricated using stir casting method. After the composite sample are subjected to examine the mechanical properties such as tensile, compressive, % of elongation, hardness and impact strength.From the test result the tensile strength of the composite sample of weight ratio Al-94% MgO-3% SiC-3% has more strength than the aluminum extracted from the E-**Waste .** The compressive strength of composite sample 2 is decreased by adding MgO. Addition of 3%MgO sample gives higher compressive strength The % of elongation of composite samples is decreased by adding MgO. 3wt.%MgO sample gets higher elongation compared with other sample. The hardness of the composite samples was increased by adding MgO.3 wt.%, of MgO samples gives higher hardness strength 61.73 VHN compared with other sample. The toughness strength of the composite sample was studied in impact charpy test was get increased by adding 3 wt.% MgO. The sample is more tougher than the other samples.

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