Aerospace, automotive, marine and construction industries rely mostly on complex structures and parts in order to function properly. Conventional materials that are used like steel, aluminium, iron, nickel, cobalt etc. requires various processing steps that have to be followed so that the required structure is achieved. This may incur more processing time and the end product also will not have a good finish. But replacement of these conventional materials by composites can reduce time and these complex parts can be manufactured with a good finish.

Intricate contours and shapes are possible without any need of high pressure tools since composites are formed when the resin solidifies or cures during production. Therefore composites can take many shapes regardless if they are created manually in low volumes or manufactured by automated process in high volumes. Unlike other materials, composites provide good surface appearance, precise properties and innovative geometrics when they are designed for complex structures.

Thus composites are more suitable when compared to conventional materials when considering corrosion resistance and part complexity.

2) Prepare a written report justifying the materials selection for the road design providing smooth and high-friction surface for vehicles. Your report should include the following. (Assessment criteria 4.2)

I. Analysis of the selected composite with other product
II. Justification on the material used
III. Design
IV. Production method used

Roads are a way or route between two places which is paved or improved to allow transportation by means of automobiles etc. Roads consists of the following components

- Sub base
- Base course
- Sub Grade
- Surface/wearing course

Roads are generally constructed using various materials like gravel, concrete, asphalt, lime stone, sand etc. which are added to the various layers of the road. Nowadays roads are constructed by means of composite materials in order to increase the efficiency of the roads and to increase their life time. Designing smooth and high- friction surfaces of roads are very important. The vehicles or automobiles which uses the roads should be able to move easily on the road and at the same time, the tyres of the vehicles should have more friction with the road.

Increase the efficiency and functionality of the equipments or components. They are used due to their huge advantages over conventional materials.

Transport:
Transportation systems use composites widely. Automobiles, planes, bicycles and trains use composites extensively. The main reasons for using composites in transportation systems are due to its light weight, strength and durability. Criteria like weight saving is very important in transportation. The transportation system demands performance and ingenuity and composites offer advanced and traditional materials to enhance the performance and to produce stronger and light weight components.

Light rail and bus manufacturers use composites to increase fuel efficiency and to enhance the interiors. They require materials that are fire retardant, durable, corrosion resistant etc. This includes various gel coats, resins, reinforcements, adhesives and putties for transportation market.

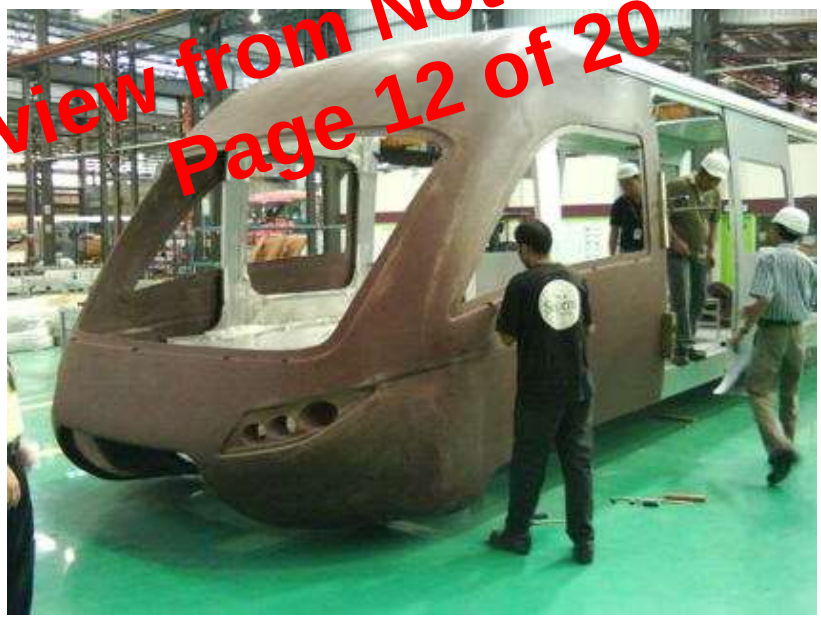

Figure 10 train nose 240kgs lighter by use of composite sandwich structure (plasticstoday, 2014)

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