

## How can energy intensive thermal processing be environmentally friendly?

When you first consider the science of thermal processing from an environmental point of view, you may ask the question, 'How can such an energy intensive process help the environment?'

However, if we consider a world without heat treatments, HIP or coatings the advantages become immediately apparent. Take an average car, for example - whether diesel, petrol, electric or gas, all need parts that are heat treated, HIPed and coated. For the wheels to turn bearings are needed, yet few people realise that it is thanks to heat treatment that the humble wheel bearing lasts the lifetime (and beyond) of the car. Certainly, better design and improved lubricants assist with this extended life, but without heat treatment a wheel bearing would be lucky to last a week. The same applies to gearboxes, final drives, engines and, in fact, all the moving parts of the vehicle.

But it doesn't end there. Modern thermal processing techniques have allowed design engineers and manufacturers to use much lighter materials, such as aluminium, and have significantly prolonged component lifetimes. By treating the aluminium used for castings and suspension components, the weight of the vehicle is reduced, which in turn leads to reduced fuel consumption and improved efficiency. Without thermal processing, the average car would weigh substantially more and require frequent replacement of parts due to wear resulting in more mining, more transport, more machining, more waste - in short, a massive environmental impact

So, whilst thermal processing is an energy intensive business, it is a vital part of the manufacturing chain and its use saves the energy it consumes many times over. The alternative would require the use of energy on such a scale that many of the things that we consider an essential part of modern day life would be economically unviable.

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