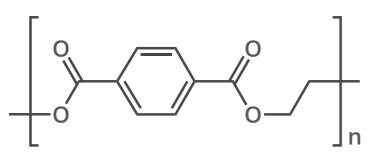
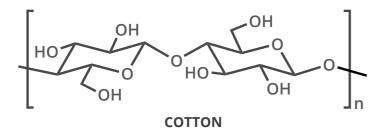
## THE CHEMISTRY OF A FOOTBALL SHIRT

## SHIRT MATERIAL – POLYESTER

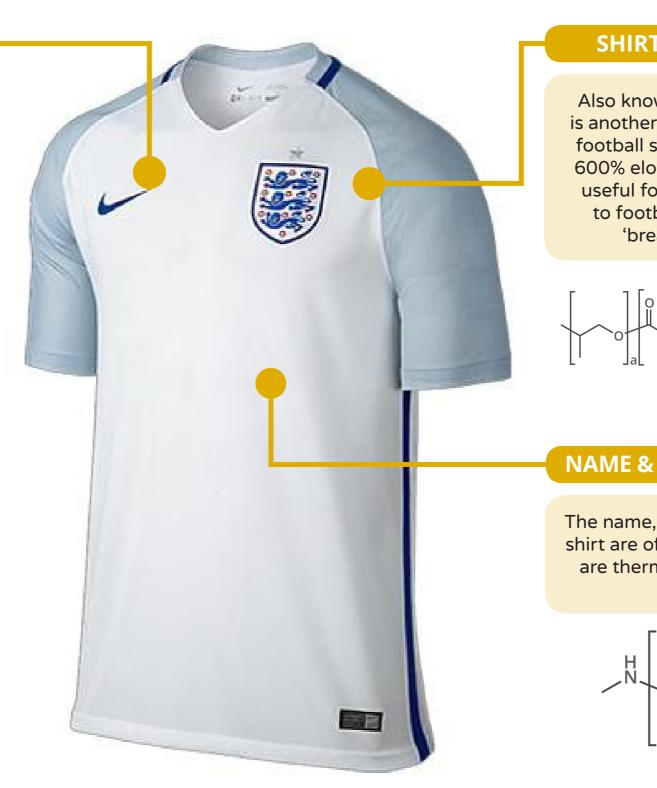
Polyesters are a group of polymers commonly used in textile applications. The polymer is a very large molecule built up from smaller molecules. The basic synthesis of polyesters involves a condensation reaction between an alcohol and a carboxylic acid; there are several methods through which this can be accomplished.



**POLYETHYLENE TEREPHTHALATE (PET)** Most common type of polyester used in textiles. Occasionally combined with cotton (below) to form polycotton



Polyester is durable, lightweight, resistant to creasing, and only absorbs 0.4% of its weight of water. It has a good 'wicking' effect - most sweat is carried along the fibres, rather than absorbed, and can evaporate.

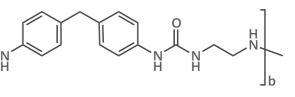




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## **SHIRT MATERIAL – ELASTANE**

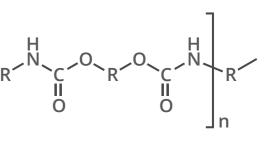
Also known as spandex or lycra, elastane is another polymer often incorporated into football shirts. It can resist approximately 600% elongation before rupturing, so it is useful for adding strength and elasticity to football shirts. However, it is not as 'breathable' as other materials.



ELASTANE

## NAME & NUMBER – POLYURETHANE

The name, number, and sponsor logo on the shirt are often made of polyurethane. These are thermally bonded to the shirt using a heat-press.



POLYURETHANE

