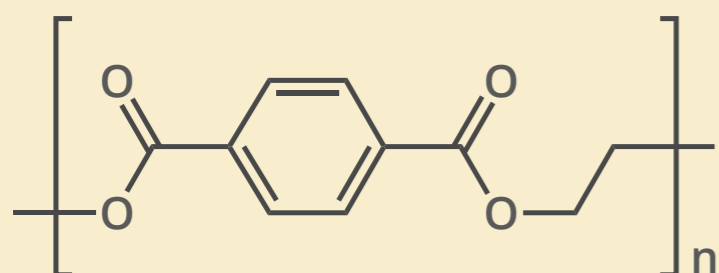


# THE CHEMISTRY OF A FOOTBALL SHIRT

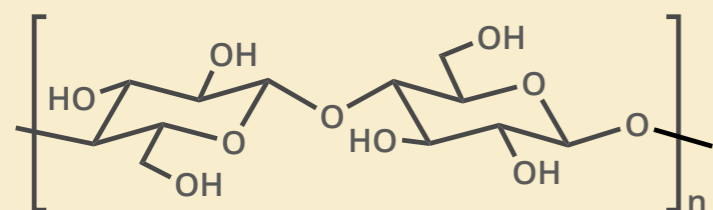
## POLYESTER

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

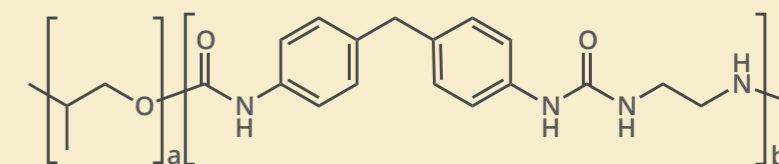


**COTTON**

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

## ELASTANE

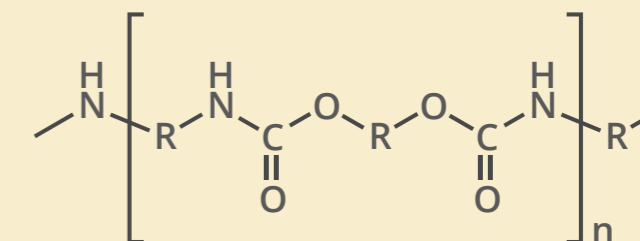
Also known as spandex or lycra, elastane is another polymer often incorporated into football shirts. It can resist approximately 600% elongation before rupturing, so it is useful for adding strength and elasticity to football shirts. However, it is not as 'breathable' as other materials.



**ELASTANE**

## POLYURETHANE

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



**POLYURETHANE**



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