AIR POLLUTION SOURCES

Air pollution is caused by a build-up of particulate matter and gases in the air, that come from a range of natural and human-made sources.

Natural sources of air pollution:

Weather, desert dust storms, forest fires, volcanoes, pollen and soil.

Human-made sources:

Transport (cars, planes, boats), fossil fuels, agricultural fertilizers, paints and varnishes, aerosols such as hair spray, landfills, industrial processes, wood burning stoves, urbanization, burning candles, furniture and cleaning products.

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AIR POLLUTION
SIZE

Particulate matter pollution is made up of particles floating in the air. These particles are often equivalent to, or smaller than, the diameter of a strand of human hair.

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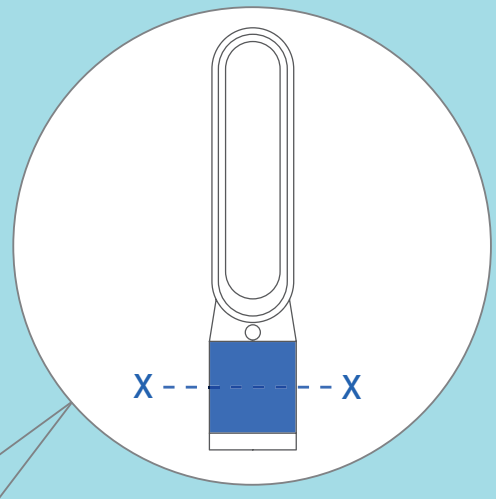
AIR POLLUTION FILTRATION

Dyson Pure Cool™ purifying fans contain two types of filter to capture both particulate matter and VOCs: the HEPA filter and activated carbon filter.



Cross Section
Dyson Pure Cool™ Purifying Fan

HEPA filter
Contains 9m^2 of borosilicate glass microfibers, pleated 254 times.

Activated carbon filter
An internal network of microscopic pores mean the activated carbon in this filter has a surface area the size of 40 football fields.

Pollutants and gases

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Capturing air pollution using filters

AIR POLLUTION MOVEMENT

The microfibers inside the HEPA filter capture 99.95% of particles as small as PM0.1. The filter captures different size particles in three ways: impaction, interception and diffusion.

Direct interception: Particles follow the air stream around the microfiber, but if they get close enough they will become trapped.

Inertial impaction: Heavier particles require more force to make them change direction. They travel in a straight line until they collide with the microfiber.

Brownian diffusion: Smaller particles travel very fast, often colliding with other particles, which causes them to regularly change direction. These particles often collide with the microfiber in the course of their random motion.

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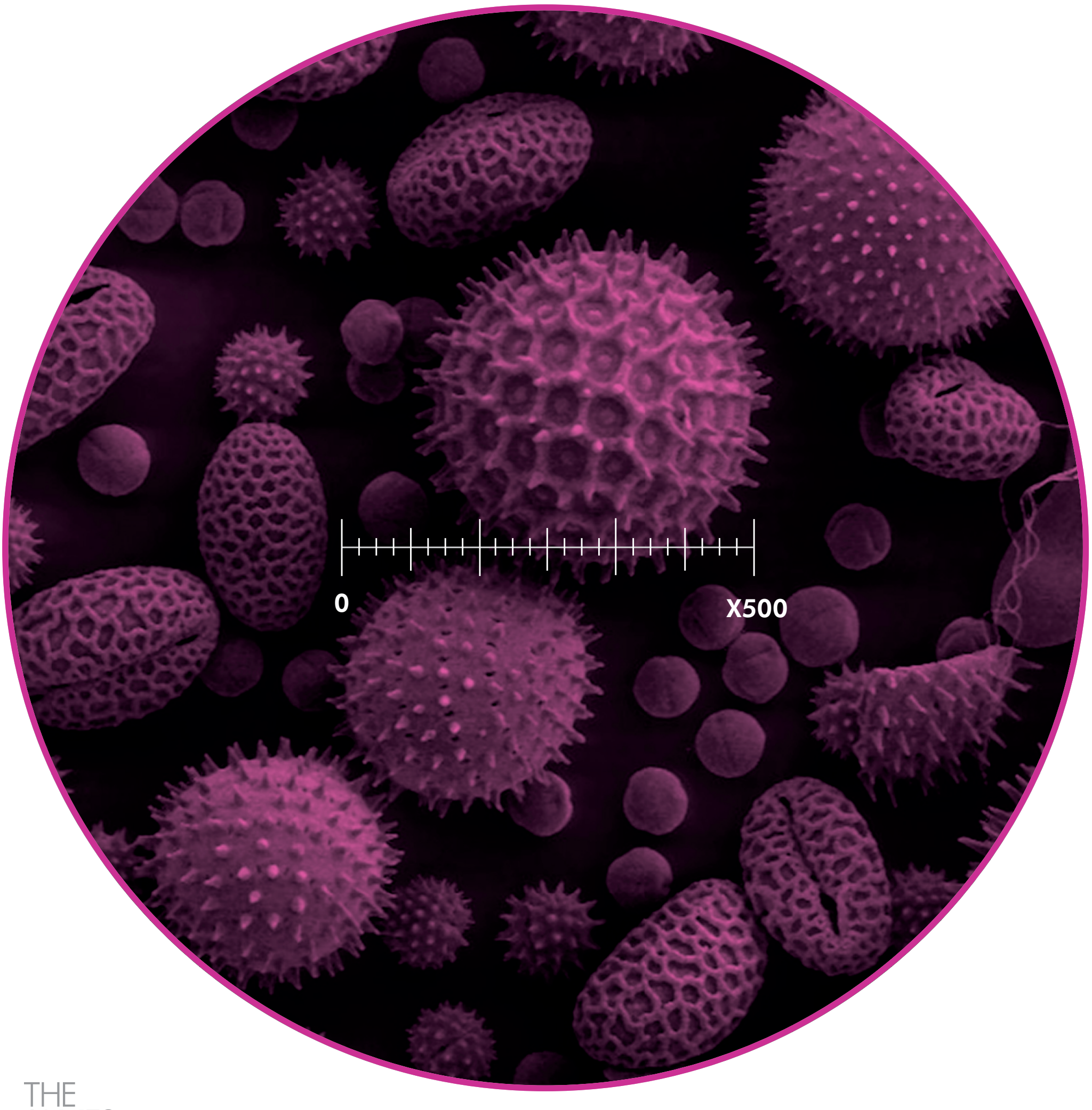
AIR POLLUTION
MAGNIFIED X500

Many pollutants are very small and can't be seen by the naked eye. Microscopes allow us to see what they look like close up.

This image shows a mixture of pollen from a variety of plants such as lilies and sunflowers. It has been magnified 500 times through an electron microscope. What do you notice about the size and shape of the particles?



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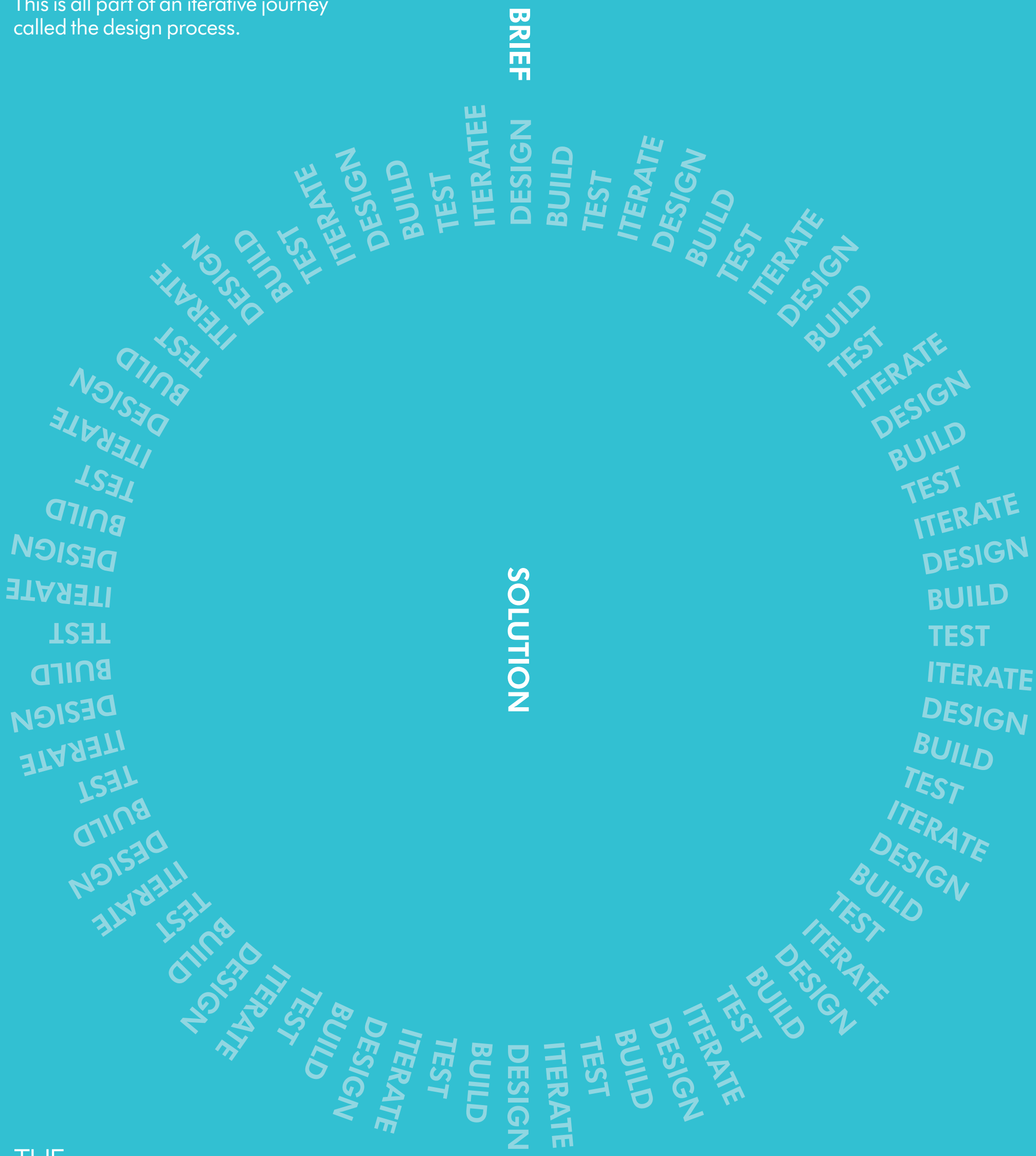
PROBLEM SOLVING
THE DESIGN PROCESS

Engineers are problem solvers. They research and develop ideas for new products and think about how to improve existing technologies. This is all part of an iterative journey called the design process.



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