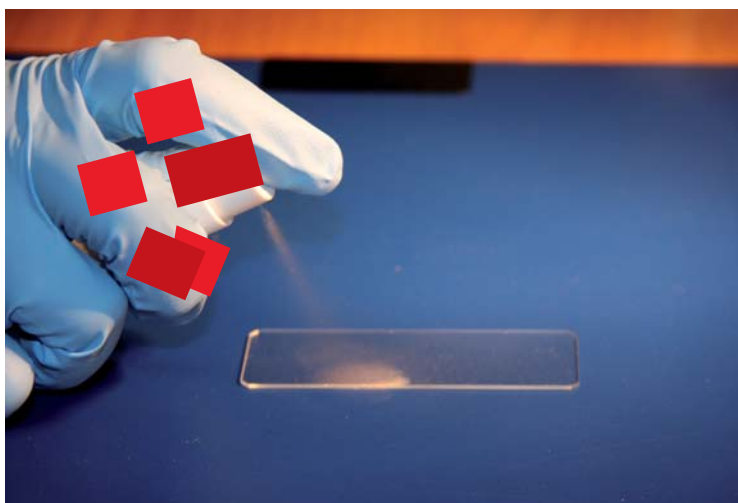


You will need

- Anti-fog spray
- Two slides
- Protective glove
- Soft cloth



Health and safety

- **Do not inhale** the vapours of the aerosol.
- **Ensure the room is well ventilated** during the anti-fog application.
- **Keep away from eyes** and wear waterproof rubber gloves when applying the spray.

What you can do

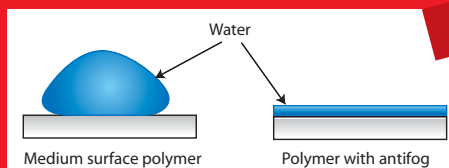
- Use a dry cloth to clean one slide well. Don't use liquid detergent!
- Put on protective gloves and then pick up the spray.
- Shake it and spray a thin layer of the liquid onto one side of the slide. Take care to avoid contact with eyes.
- Evenly distribute the film on the slide with a soft cloth before the anti-fog layer dries.
- Wait 30-60 minutes to let it dry.
- Breathe on the slide. **What do you notice?**
- To compare, breathe on a slide that has no anti-fog layer

Is there any difference between the two slides?

What's happening?

Anti-fog coatings prevent the formation of very small water droplets on glass or plastic surfaces. This compound, in general called a **surfactant**, creates a thin film that doesn't allow the formation of water droplets created by the humidity in your breath. The thin film is **hydrophilic**, or 'water loving', and causes water droplets to spread out evenly on the surface of the glass instead of remaining spherical.

Anti-fog coating is defined as a self-cleaning technology because it can help keep surfaces free of dirt and grease. In the field of self-cleaning surfaces, a substrate that remains clean can also be achieved with **hydrophobic** technology (see activity 7 on the hydrophobic textile). These two kinds of approach depend on how the nanodimensional structures of the surfaces interact with the external particles.



Anti-fog flattens the droplets of layer in a thin, transparent layer

To find out more

- Make your own anti-fog spray:
<http://www.articleslog.com/2007/12/10/97668-make-your-own-anti-fog-spray.html>
- <http://www.wordconstructions.com/articles/technical/hydrophilic.html>
- On hydrogen bonds:
<http://www.elmhurst.edu/~chm/vchembook/161Ahydrogenbond.html>

What does it mean?

Surfactant: the name comes from 'Surface active agent' and refers to all natural or synthetic substances that are able to reduce forces on the surface of a fluid (surface tension). These forces are responsible for the formation of spherical drops. Water has a very high surface tension and easily forms spherical drops due to chemical bonds called hydrogen bonds.

Hydrophilic surface: A surface with strong affinity for water. A hydrophilic compound can bond with water via hydrogen bonds and can be mixed or dissolved easily in water. Vinegar and fruit juices are examples of hydrophilic liquids which can be mixed with water.

Hydrophobic surface: A surface that has no affinity for water and will repel it without getting wet. More generally, a hydrophobic compound is a substance that can't be mixed or dissolved in water because it is not able to bond to the water molecules. For example, all oils are hydrophobic liquids, which is why oil spills float on top of the sea rather than mixing with it.