Cutting fluid

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[](http://en.wikipedia.org/wiki/File:Makino-S33-MachiningCenter-example.jpg)

[http://bits.wikimedia.org/static-1.22wmf9/skins/common/images/magnify-clip.png](http://en.wikipedia.org/wiki/File:Makino-S33-MachiningCenter-example.jpg)

Thin-wall milling of [aluminum](http://en.wikipedia.org/wiki/Aluminum) using a water-based cutting fluid on the [milling cutter](http://en.wikipedia.org/wiki/Milling_cutter).

**Cutting fluid** is a type of [coolant](http://en.wikipedia.org/wiki/Coolant) and [lubricant](http://en.wikipedia.org/wiki/Lubrication) designed specifically for [metalworking](http://en.wikipedia.org/wiki/Metalworking) and [machining](http://en.wikipedia.org/wiki/Machining) processes. There are various kinds of cutting fluids, which include oils, oil-water [emulsions](http://en.wikipedia.org/wiki/Emulsion), pastes, gels, aerosols (mists), and air or other gases. They may be made from petroleum distillates,[animal fats](http://en.wikipedia.org/wiki/Animal_fat" \o "Animal fat), [plant oils](http://en.wikipedia.org/wiki/Plant_oil), water and air, or other raw ingredients. Depending on context and on which type of cutting fluid is being considered, it may be referred to as **cutting fluid**, **cutting oil**, **cutting compound**, **coolant**, or **lubricant**.

Most metalworking and machining processes can benefit from the use of cutting fluid, depending on workpiece material. Common exceptions to this are machining [cast iron](http://en.wikipedia.org/wiki/Cast_iron) and [brass](http://en.wikipedia.org/wiki/Brass), which are machined dry.

The properties that are sought after in a good cutting fluid are the ability to:

* keep the workpiece at a stable temperature (critical when working to close [tolerances](http://en.wikipedia.org/wiki/Tolerance_(engineering))). Very warm is OK, but extremely hot or alternating hot-and-cold are avoided.
* maximize the life of the cutting tip by lubricating the working edge and reducing [tip welding](http://en.wikipedia.org/wiki/Built_up_edge).
* ensure safety for the people handling it (toxicity, bacteria, fungi) and for the environment upon disposal.
* prevent rust on machine parts and cutters.

    