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Uranium Conversion

After the uranium ore concentrate is produced at the [mill](#) (where it becomes uranium oxide or "[yellow cake](#)"), it is packaged in 55 gallon drums and sent to the uranium conversion plant. At the conversion facility, the yellow cake is processed and is then reacted with fluorine to create uranium hexafluoride (UF₆). Uranium, in the chemical form of UF₆, is suitable for use in enrichment operations and is the desired product. The UF₆ exits the process as a gas which is then cooled to a liquid and drained into 14-ton storage and transport cylinders. As the UF₆ cools over the course of five days, it transitions from a liquid to a solid. The cylinder, with UF₆ in the solid form, can then be shipped to an [enrichment](#) plant.

As with mining and milling, the primary risks associated with conversion are more chemical than radiological. The process to convert uranium ore concentrate (uranium oxide) powder to UF₆ involves a number of volatile and soluble chemicals including fluorine, hydrofluoric acid, and uranyl fluoride. These chemical forms contribute to risks associated with inhalation if a release occurred. In addition, the conversion process uses hydrogen gas (a gas that is flammable and could create an explosion hazard). Nuclear criticality is not a hazard at these facilities because the nuclear material consists of [natural uranium](#) throughout the process. Therefore, criticality is not possible.

There is one commercial uranium conversion plant in the United States. The plant is [Honeywell International Inc.](#) and it is located in Metropolis, Illinois. This plant is currently in "idle-ready" status.

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