

# Separated Plutonium around the World

(Data: End of 2018)

Click on a country to see details of each.

Country	Military Use (ton)	Non-military Use (ton)
<a href="#">Russia</a>	88.0	101.3
<a href="#">US</a>	38.4	49.3
<a href="#">France</a>	6.0	67.7
<a href="#">China</a>	2.9	0.0
<a href="#">UK</a>	3.2	115.8
<a href="#">Israel</a>	0.92	
<a href="#">Pakistan</a>	0.37	
<a href="#">India</a>	7.1	0.4
<a href="#">North Korea</a>	0.04	
<a href="#">Japan</a>		45.7
Other Non-nuclear Weapon Countries*		1.9
<b>Total</b>	<b>150</b>	<b>380</b>

\*Netherlands, Italy, Spain, Germany, Switzerland

**Military:** Plutonium used in nuclear warheads or stored for use in weapons; plutonium that is reserved for possible military uses in the future.

**Non-military:** Plutonium separated from spent nuclear fuel from a nuclear reactor for non-military purposes; plutonium declared as surplus for nuclear weapons.

The stockpile of fissile materials includes estimated ones with large uncertainties and thus total quantities are expressed in rounded numbers.

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## 【Source】

**International Panel on Fissile Materials (IPFM)**, "Fissile Material Stocks", May 2020, <http://fissilematerials.org/>

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**Harold A. Feiveson, Alexander Glaser, Zia Mian, & Frank von Hippel**: "Unmaking the Bomb," MIT Press, 2014.

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**Communication Received from Germany Concerning its Policies Regarding the Management of Plutonium**

(INFCIRC/549/Add.2-22), 12 September 2019.

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**Communication Received from Belgium Concerning its Policies Regarding the Management of Plutonium**

(INFCIRC/549/Add.3-19), 18 May 2020.

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**Communication Received from Switzerland Concerning its Policies Regarding the Management of Plutonium**

(INFCIRC/549/Add.4-23), 1 March 2019,

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(INFCIRC/549/Add.5-23), 28 August 2019.

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a5-23.pdf>

**Communication Received from France Concerning its Policies Regarding the Management of Plutonium**

(INFCIRC/549/Add.6-22), 28 August 2019.

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a6-22.pdf>

**Communication Received from China Concerning its Policies Regarding the Management of Plutonium**

(INFCIRC/549/Add.7-16). 18 October 2017.

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a7-16.pdf>

**Communication Received from the United Kingdom Concerning its Policies Regarding the Management of Plutonium** (INFCIRC/549/Add.8-22), 23 October 2019.

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a8-22.pdf>

**Communication Received from the Russian Federation Concerning its Policies Regarding the Management of Plutonium** (INFCIRC/549/Add.9-21), 5 November 2019.

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a9-21.pdf>

【Detail】

Country	Military Use (ton)	Non-military Use (ton)
Russia	88.0 tons	101.3 tons
	<p>Russia closed all its plutonium production reactors by 2010. The production (reprocessing) of plutonium for military purposes was halted in 1994. The cumulative production quantity is 137-153 tons.</p> <p>Russia currently holds 88 tons of stockpile, of which 8 tons could still be used for military purposes.</p>	<p>Russia continues reprocessing. According to figures made public on November 5, 2019, Russia has 56.5 tons of plutonium at reprocessing facilities. In addition, Russia holds a further 0.4 tons of plutonium and 4.4 tons of MOX fuel. All are from civilian nuclear reactors (INFCIRC549). It has 36 tons of "excess" plutonium originating from dismantled nuclear weapons.</p>
US	38.4 tons	49.3 tons
	<p>The US closed all its plutonium production reactors by 1987. The past production amount and the current stockpile were made public in 1994, standing at an accumulated total of 110 tons. The US announced it had 95.4 tons in September 2009. Subsequently, considering that 0.1 tons were disposed at a waste isolation pilot plant (WIPP), 0.1 tons dissipated through radiation decay, 0.4 tons were received from overseas for research reactors, and 7.8 tons were irradiated, the total stockpile is 87.7 tons. It is thought that 38.4 tons of this is for use in nuclear weapons.</p>	<p>The US currently has no separated plutonium from spent fuel in civilian nuclear reactors. The US has 4.6 tons of MOX fuel etc., 3 tons from the Savannah River National Laboratory, and 0.4 tons received from overseas. It also has 41.4 tons of "excess" weapon plutonium (as of figures announced on September 12, 2019). It was planned that the bulk of this would be used as MOX fuel but the program was suspended and how it will be disposed of in the future remains undecided.</p>
France	6.0 tons	67.7 tons
	<p>Production stopped by 1992. The previously produced amounts have not been made public but are thought to be 6-8 tons. One ton was used in nuclear testing so the current stockpile is between 5-7 tons.</p>	<p>The stockpile figures are published as of August 28, 2019. France operates large-scale civilian reprocessing plants (1,700ton U/year). The plants have reprocessed fuel on behalf of Germany and Japan. Plutonium is now being recycled in light water reactors.</p> <p>France also stores 15.5 tons of reprocessed plutonium belonging to other nations.</p>
China	2.9 tons	0.04 tons
	<p>It appears that production was halted in 1990. The total produced was 2.6-3.8 tons, of which 0.36 tons were used in nuclear tests (including production loss) and the current total stands at 2.3-3.5 tons.</p>	<p>Since 2010 a civilian reprocessing plant (50-60 tonsU/year) has been in operation. The published amount of its plutonium stockpile is 40.9 kg (as of October 18, 2019).</p>
UK	3.2 tons	115.8 tons
	<p>The UK announced in April 1995 that it had stopped the production of nuclear fissile material for nuclear explosives. It was announced in 1998 that the nation possesses 7.6 tons. The 4.1 tons of reactor-grade plutonium at the Sellafield reprocessing plant and 0.3 tons of weapons-grade plutonium were regarded as "excess" for weapons purposes. Thus the amount for nuclear weapons therefore stands at 3.2 tons.</p>	<p>The stockpile figure is as published on October 23, 2019 and includes 4.4 tons of excess weapons plutonium. The UK also stores 23.1 tons of plutonium belonging to other nations.</p>

Israel	0.92 tons	
<p>There are suspicions that Israel received the weapons ingredient uranium from South Africa. As of the end of 2017 the estimated amount in Israel's possession is 0.79-1.05 tons.</p>		
Pakistan	0.37 tons	
<p>Pakistan's reprocessing plant is capable of producing 20-40 tons of plutonium per year. Currently the nation is constructing a reprocessing plant with a capability of 2.5 times this. Pakistan's current stockpile is estimated at between 0.21-0.41 tons.</p>		
India	7.1 tons	0.4 tons
<p>Production is currently underway and the amount for weapons use is 0.42-0.72 tons. In addition, India possesses 3.4-10.4 tons of reactor-grade plutonium that has been separated from heavy water reactor fuel for strategic purposes with future use in mind. It would be possible to convert this material to military use.</p> <p>The plutonium has been extracted from heavy water reactors operating under the IAEA safeguards agreement. There are plans to construct a reprocessing plant to make fuel for fast reactors in the future.</p>		
North Korea	0.04 tons	
<p>North Korea reported to China in June 2008 that it possessed 31-37kg. Based on von Hippel's 2019 estimate the amount produced by the end of 2017 was 36-69kg. Assuming 7-15kg has been used in nuclear testing, the current inventory is 29-45kg.</p>		
Japan		45.7 tons
<p>Japan has 9.0 tons in Japan, and 36.7 tons overseas (21.2 tons in the UK and 15.5 tons in France (as of August 28, 2019)). The large-scale reprocessing plant at Rokkasho Mura (800 tonU/Year) met new regulatory standards on May 12, 2020.</p>		
Other Non-nuclear Weapon Countries*		1.9 tons
<p>*Netherlands, Italy, Spain, Germany, Switzerland</p>		
Total	150	380