

Re: How much plutonium 320 pounds 700 kg.

Source: <http://sci.tech--archive.net/Archive/sci.physics/2004-08/7437.html>

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Date: 08/24/04

Date: 24 Aug 2004 16:28:47 -0700

puppet_sock@hotmail.com wrote in message

- > *Next, 10 kg of Plutonium never made a megaton. Something in*
- > *the range of 30 to 40 kg makes a few tens of kilotons, depending*
- > *on how you arrange things.*
- > *Socks*

For the Nagasaki fat man bomb (and also the Trinity gaget), the core was 6.4 kg of Pu, with a yeild of 20 kT, which gives you about a fision fraction of 17%. For little boy with yield of 12 kT and a heck of a lot more U-235 (something like 60 kg) the fission fraction is down to 2%.

If you look at the "super oralloy" fission bombs which made use of a composite Pu and U core managed to get fission yields as good as fat man, then for a yeild of 500 kt (25 times fat man) you need 25 times the metal, or something on the order of $6.4 \times 25 = 160$ kg. That would be Theodore Taylor's monster King Ivy fission bomb. The one they made in case the H-bomb didn't work. Using uranium in the core allowed them to construct a much larger core, since fewer stray neutrons generated by spontaneous fission in U-235 it allows more time during implosion.

However, it's not difficult for me to believe that a much bigger core would and could give better fission-fraction yields than the somewhat minimalist Trinity/fat man bombs. After all, the bigger the core, the better your surface/volume ratio and the larger the fraction of atoms you should be able to fission. Knowing how scientists do things, I'll bet you the King-Ivy core was probably exactly 100 kg, and the fission fraction was therefore $17\% \times 1.6 = 27\%$.

SBH