

Radioactivity of Takumar lenses

Here are the latest measuring results of my research into the radioactivity of Takumar lenses. Radioactivity is not limited to the Super-Takumar 1:1.4/50. The Super-Multi-Coated Takumar and SMC Takumar equivalents show the same characteristics. I also found several Super-Takumar 1:1.8/55 and Super-Takumar 1:2/55 lenses to be radioactive. Apparently, the 8-element 1:1.4/50 Takumar lenses are NOT radioactive!

Thorium dioxide was added to glass in the 1960's to increase the refractive index. The radioactivity (alpha radiation) of the thorium caused both a safety and pollution hazard and self-degradation of the glass (turning it yellow over time).

Alpha radiation is effectively shielded by a few centimeters of air, a piece of paper or the thin layer of dead skin cells that make up the epidermis, so it is not dangerous. The biggest danger is swallowing or inhaling an alpha radiation emitting object or being injected with an alpha radiation emitting substance. Don't smash your radiating lenses with a sledgehammer, because this might spread little shards of radioactive glass.

The radiation levels of the tested Takumar lenses are stated in micro sievert per hour ($\mu\text{Sv/h}$). A set of dental radiographs will expose you to approx. 5 μSv of X-rays. If a Takumar lens was to emit 5 $\mu\text{Sv/h}$, you would receive the same dose if you expose yourself to that lens for 1 hour. You need to be really close to the lens to get any radiation, though. My Gamma Scout Radiation Detector only started to react when I put the lens within an inch of the receptacle.

The latest results are shown in the table below.

Type	Serial #	$\mu\text{Sv/h}$
SMC TAKUMAR 1:3.5/15	7129969	0
Super-Takumar 1:3.5/28 (I)	906776	0
Super-Takumar 1:3.5/28 (II)	2366540	0
Super-Multi-Coated TAKUMAR 1:3.5/28	8319941	0
Super-Takumar 1:2/35 [Model I]	1896168	5.5
Super-Takumar 1:2 / 35 [Model II]	3244981	> 9
Super-Multi-Coated TAKUMAR 1:2/35	6038968	> 10
Super-Takumar 1:1.4/50 (8-element)	1251540	0
Super-Takumar 1:1.4/50 (8-element)	1311073	0
Super-Takumar 1:1.4/50 (8-element)	1556517	0
Super-Takumar 1:1.4/50 (7-element)	1956869	> 10
Super-Multi-Coated TAKUMAR 1:1.4/50	4992856	> 7.7
SMC TAKUMAR 1:1.4/50	5028933	> 10
Super-Takumar 1:1.8/55 [Model II]	1568820	> 7
Super-Takumar 1:1.8/55 [Model II]	1804556	> 7
SMC TAKUMAR 1:1.8/55	5573735	> 10
Super-Takumar 1:2/55 [Model II]	3156851	> 8
SMC TAKUMAR 1:2/55	7893300	> 10
Super-Multi-Coated TAKUMAR 1:1.8/85	5698244	7