

Gems & Gemology Data Depository: Durability and stability of the treatment in Be lattice diffusion-treated orange to pinkish-orange sapphires.^a

Test	Procedure	Result
Ultrasonic cleaning	Placed in ultrasonic cleaner containing a solution (10%) of commercial jewelry cleaner (Health Sonics Corp.) and water for 45 minutes at a temperature of approximately 75°F.	No effect on treatment
Steam cleaning	Steam cleaner with pressure at 80 psi, ring-set stones placed one-half to one inch from the nozzle for approximately 45 seconds.	No effect on treatment
Heat and chemicals from jewelry repair	^b One prong tip sawed off and retipped with 14K white gold wire and 14K white hard solder (melting point approximately 1456°F) without any borax-containing fire coating on stone (the ring and stone were first fire coated with a boric acid/methyl alcohol solution; then a small paintbrush dipped in water was carefully used to remove all of the fire-coat from the stone). After retipping, the stone was removed from the mounting and carefully examined under magnification.	No effect on treatment
	^b The stone was reset in the same 14K white gold ring. Another prong tip was removed by grinding; stone and mounting was fire coated with boric acid/methyl alcohol solution and prong was retipped (this time without removing the fire coat from the stone) with 18K white gold wire and 18K white hard solder (melting point 1513°F). After retipping, the stone was removed from the mounting and carefully examined under magnification.	No effect on treatment (except for a very small area showing extremely minor etching under the prong that was retipped)
	^c The stone-set ring was encased in “jet-set” and allowed to cool. “Jet-set” is a moldable plastic when at temperatures around 220°F, and hard when cool (at room temperature).	No effect on treatment
	^c All six prongs on the stone-set 14K yellow gold ring were ground down; stone and mounting was fire coated with boric acid/methyl alcohol solution and prong was retipped (without removing the fire coat from the stone) with 14K yellow gold wire and 14K yellow hard solder (melting point approximately 1398°F). After retipping, the stone was removed from the mounting and carefully examined under magnification.	No effect on treatment
Rhodium electroplating	^d The stone-set ring was cleaned, then flash rhodium electroplated for five minutes at 6 volts, then 10–15 seconds at average of 3 volts; two-step plating procedure repeated, followed by second cleaning.	No effect on treatment
Laser welding	^b The stone-set ring was welding at one prong using a Laser Star Workstation CPP standard model #501-6001 laser welding	No effect on treatment

	machine (at normal settings for soldering gold).	
	^b The stone-set ring was intentionally hit in the same area with the laser at a 45° angle on the table three separate times.	A large area on the pavilion, directly under where the laser struck the stone, was severely burned (surface-reaching cracks). No damage was observed on table. (This damage would have also occurred on a natural or heat-treated sapphire.)

^aAll tests performed by Don and Corey Johnson, Eaton-Turner Jewelry, Helena, Montana.

Tests and results are for all 3 stones unless otherwise indicated.

^b1.12-ct medium dark pinkish-orange oval mixed-cut from Thailand.

^c0.43-ct dark orange oval mixed-cut from Thailand.

^d0.83-ct intense reddish-orange princess-cut from Thailand.