

Magnetic Susceptibility Index for the Primary Gemstones

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Magnetic measurements are standardized to N-52 magnets.

Colorless and extremely pale stones of any species tend to be Inert (Inert includes Diamagnetic).

Black opaque stones of many species Pick Up or Drag.

Pick Up/Drag responses are weight-dependent. Large gems over 2cts may be too heavy to Pick Up/Drag.

A few non-Garnet gems that are strongly magnetic may Pick Up when under 0 .5ct.

Gem Type	Response Range	SI X 10(-6)	Cause of Color
<u>Grossularite Garnet</u>			
<i>Tsavorite & Merelani</i>	Moderate to Strong	118-336 SI	Vanadium, Chromium
<i>Hessonite (pale to dark)</i>	Moderate to Strong	91-308 SI	Iron
<i>Hydrogrossular (green)</i>	Strong	243-321 SI	Iron, Chromium
<i>Mali</i>	Drags	543-720 SI	Iron
<u>Andradite Garnet</u>			
<i>Melanite (black)</i>	Picks Up	1550 SI	Iron, Titanium
<i>Demantoid</i>	Picks Up	2466-2752 SI	Iron, Chromium
Uvarovite Garnet	Picks Up	above 780 SI	Iron, Chromium
Rhodolite Garnet	Picks Up	1007-1708 SI	Iron, Chrom., Van. Titan.
Pyrope Garnet	Picks Up	1308-1708 SI	Iron, Chrom., Van.
Malaya Garnet	Picks Up	1217-2417 SI	Mang., Iron, Chrom., Van.
Color Change	Picks Up	890-3870 SI	Mang., Iron, Chrom, Van., Titan.
Almandine Garnet	Picks Up	2071-3094 SI	Iron
Spessartine Garnet	Picks Up	4301-4728 SI	Manganese, some Iron
GGG (Synthetic Garnet)	Picks Up	6358 SI	Rare-earth
Glass/Garnet Doublet	Inert Glass side/ Strong Garnet side	794-942	Iron

Diamond

Colorless / Fancy Colors/Black Inert not detectable Carbon,Nitrogen, Boron, Irrad.

Corundum

Ruby Weak to Moderate 26-109 SI Chrom., Titanium, Iron

Blue Sapphire Inert (Sri Lanka) to Moderate 0-330 SI Titanium, Iron

Fancy Color Sapphires Weak to Moderate 20-191 SI Chrom., Titanium, Iron

Black Star Sapphire Weak to Moderate 20-143 SI Titanium, Iron

Synthetic Corundum

Lab Ruby Inert to Strong 0-195 SI Chromium, Titanium

Lab Sapphire Inert not detectable Titanium

Chrysoberyl Weak to Moderate 20-127 SI Iron

Zircon (any color) Inert not detectable Color Centers

Spinel

Pale colors Inert to Weak 0-48 SI Iron, Cobalt, Chromium

Pink, Red, Blue, Black Weak to Moderate 48-104 SI Iron, Cobalt, Chromium

Cobalt Blue (ghanospinel) Moderate 130 SI Iron, Cobalt

Synthetic Spinel

Most colors Inert not detectable Various

Green Inert to Moderate 0-122 SI Manganese, Chromium

Topaz

Blue,Pink,Sherry,Brown,Green Inert not detectable Color Centers, Chrom.

Imperial Topaz Inert not detectable Color Centers, Chrom.

Beryl

Morganite, Blue Inert not detectable Chrom., Van., Mang.

Golden/Heliodor Weak 22-48 SI Iron

<i>Emerald</i>	Weak	20-56 SI	Chromium, Vanadium
<i>Red Beryl (Bixbite)</i>	Weak	30 SI	Manganese
<i>Aquamarine (pale to medium blue)</i>	Weak to Moderate	20-100 SI	Iron
Synthetic Emerald	Weak to Moderate	26-143 SI	Chromium, Vanadium

Tourmaline

<i>Colorless Achroite (Elbaite)</i>	Inert	not detectable	None
<i>Yellow (Elbaite)</i>	Inert	not detectable	Unknown
<i>Yellow (manganese)</i>	Drags	443 SI	Manganese
<i>Brown (Dravite)</i>	Inert	not detectable	Magnesium
<i>Chrome Tourmaline</i>	Inert	not detectable	Chromium
<i>Pink & Mauve (Elbaite)</i>	Inert to Strong	0-291 SI	Manganese
<i>Red Rubellite (Elbaite)</i>	Inert to Strong	0-326 SI (wide range)	Manganese
<i>Watermelon (Elbaite)</i>	Weak	43 SI (red side) 65 SI (green side)	Various
<i>Green (Elbaite)</i>	Strong to Drags	148-418 SI	Iron, Chromium, Vanad.
<i>Cuprian Paraiba any color (Elbaite)</i>	Strong	221-399 SI	Copper, Manganese, Titanium
<i>Indicolite (Elbaite)</i>	Drags	347-369 SI	Iron
<i>Black (Schorl)</i>	Drags	924 SI	Iron

Jadeite Jade

<i>White/Yellow</i>	Inert to Weak	0-48 SI	none
<i>Orange</i>	Weak	not detectable	Iron
<i>Green</i>	Weak to Moderate	65-104 SI	Iron, Chromium
<i>Red</i>	Weak to Moderate	40-122 SI	Iron
<i>Purple</i>	Weak to Moderate	22-130 SI	Iron

Nephrite Jade

<i>White, Yellow</i>	Inert	not detectable	none, some Iron
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<i>Green</i>	Moderate to Strong	91-312 SI	Iron
<i>Black</i>	Strong	321 SI	Iron
Tanzanite (any color)	Inert	not detectable	Vanadium
<u>Diopside</u>			
<i>Chrome Diopside</i>	Weak to Strong	56-296 SI	Chromium
<i>Black Star Diopside</i>	Picks Up	8,925- 9,960 SI	Iron (magnetite)
<u>Quartz (macro-crystalline)</u>			
<i>Colorless</i>	Inert	not detectable	None
<i>Amethyst</i>	Inert	not detectable	Color Centers
<i>Citrine</i>	Inert (weak in rare cases)	not detectable	Irradiation, maybe Iron
<i>Smoky</i>	Inert	not detectable	Irradiation
<u>Quartz with Inclusions</u>			
<i>Rutile & Most Other Incl.</i>	Inert	not detectable	Varies with Inclusions
<i>Tourmaline Inclusions</i>	Weak	43-56 SI	Iron, Copper
<i>Chrysocolla (Gem Silica)</i>	Weak to Moderate	69-82 SI	Copper
<i>Tiger's Eye</i>	Inert to Picks Up	0-3889 SI	Iron impurities
<u>Quartzite</u>			
<i>Aventurine Quartz</i>	Inert to Weak	0-27 SI	Unknown
<u>Chalcedony</u>			
<i>Carnelian</i>	Inert	not detectable	Iron
<i>Onyx</i>	Inert	not detectable	Iron
<i>Most Agates & Jaspers</i>	Inert	not detectable	Iron
<i>Green Agate (Mtorolite)</i>	Inert	not detectable	Chromium
<i>Bloodstone</i>	Weak to Strong	26-521 SI	Iron
<i>Chrysoprase</i>	Weak to Strong	42-224 SI	Nickel

<i>Mahogany Jasper</i>	Strong	217 SI	Iron
<i>Fire Agate</i>	Picks Up	3975 SI	Iron, Interference clrs
<i>Red Jasper</i>	Weak to Picks Up	69-8836 SI	Iron

Orthoclase Feldspar

<i>Moonstone</i>	Inert	not detectable	Scattering of Light
<i>Yellow (Noble) Orthoclase</i>	Weak to Moderate	65-104 SI	Iron

Oligoclase Feldspar

<i>African & Indian Sunstone</i>	Inert	not detectable	Iron (Hematite)
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Andesine Feldspar

<i>Untreated (yellow, reddish)</i>	Weak	not detectable -20 SI	Copper
<i>Diffused (red & green)</i>	Weak	not detectable -20 SI	Copper

Labradorite Feldspar

<i>Spectrolite</i>	Inert	not detectable	Interference Colors
<i>Yellow Labradorite</i>	Weak	not detectable -26 SI	Unknown
<i>Oregon Sunstone (red, green)</i>	Weak	not detectable -29 SI	Copper
<i>Oregon Sunstone (copper schiller)</i>	Weak	not detectable -29 SI	Copper

Bytownite Feldspar

Microcline Feldspar

<i>Amazonite</i>	Inert	not detectable	Lead, Color Centers
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Peridot	Drags	417-590 SI	Iron
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Prehnite (green)	Weak to Moderate	26-122 SI	Iron
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Spodumene

<i>Kunzite (pink, purple)</i>	Inert	not detectable	Chromium
<i>Yellowish, Greenish</i>	Inert	not detectable	Chromium
<i>Hiddenite (dark green)</i>	Unknown	unknown	Chromium

Opal

Fire Opal Inert not detectable Light Diffraction
Play of Color Opal (all types) Inert not detectable Light Diffraction

Jet Inert not detectable Organic Carbon

Ivory Inert not detectable Organic

Amber Inert not detectable Organic

Coral Inert not detectable Organic

Pearl Inert not detectable Organic

Shell Inert not detectable Organic

Tortoise Shell Inert not detectable Organic

Turquoise

Blue Weak to Moderate 26-135 SI Copper

Green Weak to Strong 35-278 SI Copper, Iron

Iolite Moderate-Strong 105-200 SI Iron

Kyanite

Blue Inert not detectable Iron, Chrom., Titanium

Green Weak 61 Vanadium

Andalusite Inert not detectable Manganese

Idocrase (green) Strong 217 SI Iron

Rhodonite Picks Up 3610-3936 SI Manganese

Rhodocrosite Picks Up 3515 SI Manganese

Fluorite (any color) Inert not detectable Color Centers

Apatite (any color) Inert not detectable Manganese, Rare-earth

Calcite

<i>Most Colors</i>	Inert	not detectable	Various Metals
<i>Pink Calcite</i>	Weak	22-26 SI	Cobalt
Sodalite	Weak	not detectable -48 SI	Color Centers
Lapis Lazuli	Inert	not detectable	Sulfur, Color Centers
Serpentine (opaque)	Drags to Picks Up	363-1519 SI	Iron, Chromium, Nickel
Malachite	Drags	477 SI	Copper
Hematite (natural crystal)	Picks Up	2604-6853 SI	Iron
Psilomelane	Drags to Picks Up	343-1007 SI	Manganese

Obsidian

<i>Transparent</i>	Weak to Moderate	74-95 SI	Iron
<i>Translucent</i>	Strong	247 SI	Iron
<i>Opaque</i>	Drags	304 -750 SI	Iron
<i>Mahogany (reddish)</i>	Picks Up	1953 SI	Iron
Moldavite Glass	Weak	69 SI	Iron
Libyan Desert Glass	Inert	not detectable	Iron
Synthetic Rutile	Inert to Very Weak	not detectable	Rare-earth Elements
Strontium Titanite	Inert	not detectable	None

Cubic Zirconium

Most colors	Inert to Weak	0-39 SI	Various
Pink	Drags	430-807 SI	Rare-earth Elements

YAG (Synthetic Garnet)

<i>Yellow</i>	Inert to Weak	0-35 SI	Titanium
<i>Green</i>	Inert to Strong	0-278 SI	Chromium

<i>Pink</i>	Strong to Drags	563-716 SI	Manganese
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Man-made Glass

<i>Most Colors</i>	Inert	not detectable	Various
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<i>Blue</i>	Inert to Weak	0-61 SI	Cobalt
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<i>Goldstone</i>	Moderate to Strong	135-221 SI	Copper Particles
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Plastic	Inert	not detectable	Various
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