

CIBJO Jade Guide

Progress Report

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CIBJO Guides Jade

A taxonomy for Fei Cui (翡翠), Jade, Jadeite, Nephrite, and Yu (玉).

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The concept of a Guide to explain jade in relation to the fei cui nomenclature came about following multiple discussions between Gaetano Cavalieri, the President of CIBJO, and Siu-kee (Kent) Wong, Managing Director of Chow Tai Fook Jewellery Group & representative of industry advisors on the Fei Cui project of the Gemmological Association of Hong Kong (GAHK); Shang I (Edward) Liu, Chairman of the GAHK; and Wai Chung (Norman) Siu, Director of the GAHK. over a period of three years, when the GAHK gave presentations during CIBJO Congresses, it was agreed that a guide wouldm be produced under the leadership of the President of the CIBJO Gemstone Commission, Charles Abouchar.



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Jade Guide Working Group

composed of experts in both the western and eastern jade/fei cui worlds .



A brief overview of progress

- All meetings have been via Zoom video conferencing with e-mail and other messaging applications in between.
- Currently at 81 educational pages of illustrated jade/fei cui information
- Hundreds of potential images
- Covers all jade/fei cui producing (present and historic) countries and the materials produced



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The following presents a simple overview of the present content within the CIBJO Jade Guide



1 Definitions

Actinolite: a monoclinic amphibole mineral with the chemical formula $\text{Ca}_2(\text{Mg}_{4.5-2.5}\text{Fe}_{0.5-2.5}\text{Si}_8\text{O}_{22}(\text{OH})_2$.

Achromatic colour: neutral colour without hue – such as white, black, or any shade of grey

Aggregate (Rock): A mass or body of rock particles, mineral grains, or a mixture of both.

Albite: a mineral aggregate that predominantly consists of albite from the feldspar group

Amphibole: The amphibole supergroup is a group of rock-forming silicates that, in the field, have a similar appearance, see Appendix D and (Hawthorne 2012).

Breakage: fracture/cleavage formation and fragmentation, due to external forces, such as impact or compression.

Clarity: the presence /absence of internal or external features and their type, size, quantity and location that affect the overall appearance and/or durability of fei cui / jade.

Cleavage: the tendency of a crystalline substance to split into fragments bounded by plane surfaces.

Colour: characteristic of visual perception that can be described by attributes of hue, brightness (or lightness) and colourfulness (or saturation or chroma).
(CIE S 017:2020 ILV, International Lighting Vocabulary, 2nd edition, entry 17-22-040).

Chromatic colour: any colour that is not neutral (not grey, white, or black) — in other words, a colour that is perceived as red, yellow, green, blue, or somewhere in between.

Dushan (Tushan) Yu: an aggregate composed primarily of plagioclase and zoisite, with accessory minerals including chromian muscovite and actinolite. It typically exhibits white, green, pink, purple, blue-green, yellow, and black.

Fei Cui (翡翠): an historic Chinese name (pronounced *fay choy*) for a structurally tough ornamental aggregate composed solely or principally of any of the following or any combination of the following jadeite, omphacite, and kosmochlor, forming jadeite jade/Jadeite fei cui, omphacite jade/omphacite fei cui or kosmochlor jade/kosmochlor fei cui¹, and potentially a small amount of other minerals.

¹ It should be noted while some gemmological laboratories give results that indicate jadeite jade/Jadeite fei cui, "omphacite jade/omphacite fei cui" and/or "kosmochlor jade/kosmochlor fei cui" there are some cases, either through preference or challenges in reaching such a conclusion, where laboratories opt for using "fei cui" as an all-encompassing test result.

Fracture: the property of a mineral, aggregate, rock or other materials, breaking in a more or less random pattern with no smooth planar surfaces, not a cleavage.

Fragmentation: a sand-sized particle or sand grain that is made up of multiple grains that are connected on the grain scale.

Hetian Yu (和田玉): pronounced *huh tyan yoo*, gem-quality nephrite jade in Chinese gemmology.

Hue: The aspect of colour that indicates whether it is perceived as red, yellow, green, blue, or somewhere in between on the colour circle.

Imitation: artificial products that imitate the appearance of natural materials without having their chemical composition or their physical properties or their structure.

Imperial jade: trade name applied to gem-quality translucent emerald-green fei cui

Jade: a traditional western term for a structurally tough mineral aggregate/rock that predominately consists of jadeite or nephrite only².

Jadeite: a monoclinic pyroxene mineral with the ideal chemical formula is $\text{NaAlSi}_2\text{O}_6$.

Jadeite jade/Jadeite fei cui: a structurally tough mineral aggregate that predominately consists of jadeite³.

Jadeite: A rock composed principally of jadeite ($\text{NaAlSi}_2\text{O}_6$), occurs either as individual tectonic blocks or as pods, lenses or veins in other blocks within serpentine or serpentine-matrix (L. Zhao, Ma, H., Fangy, C., Ding, L., Liu, B., Jia, X. 2019).

Kosmochlor: a monoclinic pyroxene mineral with the ideal chemical formula $\text{NaCrSi}_2\text{O}_6$.

Kosmochlor jade: predominately consists of kosmochlor⁴.

Maw-sit-sit: an ornamental rock composed primarily of kosmochlor and amphibole group, chlorite group, minerals and feldspar.

² The term jade is restricted for use with jadeite jade or nephrite jade only it shall not be used in conjunction with any other yu.

³ It should be noted that while some gemmological laboratories give results that indicate "jadeite jade/jadeite fei cui", there are some cases, either through preference or challenges in reaching such a conclusion, where laboratories opt for using "fei cui" as an all-encompassing test result.

⁴ It should be noted while some gemmological laboratories give results that indicate "kosmochlor jade/kosmochlor fei cui" there are some cases, either through preference or challenges in reaching such a conclusion, where laboratories opt for using "fei cui" as an all-encompassing test result.

Mutton fat jade: trade name applied to translucent pure white nephrite with greasy lustre and without visible inclusions; traditionally found near Hetian, Xinjiang, China.

Misnomer: a name that is incorrectly or unsuitably applied.

Natural: materials that are completely formed by nature, without human intervention during their formation that may subsequently be modified by normal lapidary processes or which are altered by a treatment.

Nephrite: a rock composed of the amphibole group minerals actinolite and tremolite and is an interlocking mass of fibrous crystals.

Nephrite jade: predominately consists of nephrite.

Omphacite: an intermediate monoclinic pyroxene mineral of the jadeite-diopside series with an ideal chemical formula of $(\text{Na}, \text{Ca}) (\text{Al}, \text{Mg}, \text{Fe}) \text{Si}_2\text{O}_6$.

Omphacite jade/Omphacite fei cui: a mineral aggregate that predominately consists of omphacite⁵.

Pyroxene: a supergroup of minerals that includes the three major constituents of fei cui, namely jadeite, omphacite and kosmochlor see appendix D and (Morimoto 1988).

Saturation: Saturation is how strongly a colour is perceived to differ from an achromatic colour of the same lightness — in other words, how “intense” or “washed-out” the colour appears.

Synthetic: artificial products having essentially the same chemical composition, physical properties and structure as that of their naturally occurring counterparts.

Texture: the collective set of characteristics including size, shape, uniformity and interrelationships of mineral grains or fabric within a rock or mineral

Tone: a grey scale value is described numerically where 0 is black and 255 is white. In between, every other number is a shade of Gray ranging from black to white.

Tough or Toughness: resistance to breakage.

Treated: material that has been treated by ways other than normal lapidary practices to change their appearance and/or durability.

Tremolite: a monoclinic amphibole mineral with the chemical formula $\text{Ca}_2\text{Mg}_5(\text{Si}_8\text{O}_{22})(\text{OH})_2$.

Turkiyenite: a purple mineral aggregate from Turkey composed primarily of jadeite and associated with quartz, orthoclase, epidote, chloritoid and phlogopite (Digennaro et al. 1997; Hatipoglu et al. 2012; Hatipoğlu and Başevirgen 2012).

Yu (玉): a Chinese gemmological term (pronounced yoo) broadly referring to any mineral aggregate that is beautiful, rare, durable, tough, and can be crafted with cultural significance.

Zhong (种): Chinese trade descriptor for the texture and transparency of fei cui.

⁵ It should be noted while some gemmological laboratories give results that indicate “omphacite jade/omphacite fei cui” there are some cases, either through preference or challenges in reaching such a conclusion, where laboratories opt for using “fei cui” as an all-encompassing test result.

Understanding Fei Cui (翡翠), Jade, Jadeite, Nephrite, and Yu (玉)



The following flow chart provides a perspective on the terminology and classification systems that generally exist between the Chinese Yu culture and non-Chinese jade cultures. In this chart, green text represents terminology and concepts rooted in Chinese gemmological and cultural contexts, while blue text reflects terms and classifications rooted in traditional Western gemmology,

Yu 玉
In ancient China, "yu" once referred exclusively to nephrite jade. However, with the development of yu's market applications in China and people's deep affection for yu, the Chinese gemmological system* defines yu (Yushi玉石) as a broader gemmology term, it encompasses any mineral aggregate that is "beautiful," rare, durable, tough, and carvable*.

Fei Cui 翡翠
A Chinese gemmological name for a mineral aggregate, composed solely or principally Of any of the following or any combination of the following, jadeite, omphacite and kosmochlor.

Other varieties

Fei Cui that is predominately composed of omphacite or kosmochlor, or any combination of the following, jadeite, omphacite, and kosmochlor.

Jadeite jade

Fei Cui that is predominately composed of jadeite is referred to as jadeite jade in Western gemmology

Hetian Yu 和田玉 / Nephrite jade

A gemmological name for a rock composed of the amphibole group minerals actinolite and tremolite and is an interlocking mass of fibrous crystals .

Jade

A traditional Western term that encompasses jadeite and nephrite only

Other species

Quartzite Yu, Dushan Yu, Serpentine Yu, Albite Yu, Maw sit sit etc



Fei Cui (翡翠)

Fei Cui does not inherently denote quality (as both high- and low-quality variants exist).

Descriptions for treated or artificial materials should align with those of other gem materials, i.e., all artificial materials should be clearly described, all treatments should be clearly stated in any descriptions,

Chinese trade names are listed and described in Appendix A. While this listing primarily applies to the Chinese market some may also be prevalent in Western terminology, when this is the case, these names are followed by an asterisk thus (*).

APPENDIX A – CHINESE TRADE NAMES FOR FEI CUI

The following are some of the varieties etc....

Chinese Trade terms	Description - main considerations	Examples
Imperial Green 帝王绿(*)	Colour: Green with vivid and intense saturation, evenly distributed across the stone Transparency: Transparent to semi-transparent Texture: Extra fine to fine	
Apple Green 苹果绿	Colour: Yellowish green, with medium saturation, evenly distributed across the stone	
Pea green 豆绿	Colour: Light green to bluish green, with relatively low saturation Transparency: Semi-transparent to semi-translucent Texture: Coarse	
Greyish green (Oily green) 油青	Colour: Green to bluish green, may have a dark tone Transparency: Semi-transparent to translucent Texture: Fine	

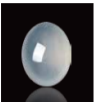
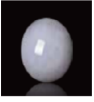
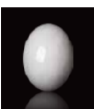


Terms	Chinese name (Chinese characters)	Chinese Pronunciation (pinyin)	English Pronunciation
Yu	玉	yu	yoo
Fei Cui	翡翠	fei cui	fey tsway
Zhong	种	zhong	jong
Nephrite jade	和田玉	hetian yu	huh-tyahn-yoo
Qing Nephrite Jade	青玉	qing yu	ching-yoo
Mutton Fat Yu	羊脂玉	yang zhi yu	yahng-jir-yoo
Bi Hetian Yu	碧玉	bi yu	bee-yoo
Cuiqing Hetian Yu	翠青	cui qing	tsway -ching
Yellow Nephrite Jade /Huang Hetian Yu	黄玉	huang yu	hwahng-yoo
Brown Nephrite Jade /Tang Hetian Yu	糖玉	tang yu	tahng-yoo
Black Nephrite Jade /Mo Hetian Yu	墨玉	mo yu	maw-yoo
Imperial Green	帝王绿	di wang lv	dee-wahng-loo
Apple Green	苹果绿	ping guo lv	ping-gwoh-loo
Pea green	豆绿	dou lv	doh-loo
Greyish green	油青	you qing	yoh-ching
Hte Long Sein	铁龙生	tie long sheng	tee-lohng-sheng
Opaque Green	干青	gan qing	gahn-ching
Sky Blue	天空蓝	tian kong lan	tee-ahn-kohng-lahn
Fei	翡	fei	fay
Inky-Black	墨翠	mo cui	maw-tsway
Yellow-Green	黄加绿	huang jia lv	hwahng-jee-ah-loo
Lavender-Green	春带彩	chun dai cai	choon-die-tsai
Lavender	紫罗兰	zi luo lan	tzee-loh-lahn
Fu Lu Shou	福禄寿	fu lu shou	foo-loo-show
Floating Flowers	飘花	piao hua	pee-ow-hwah
Silkie /Black skin and bones Chicken	乌鸡	wu ji	woo-jee
Glassy Zhong	玻璃种	bo li zhong	boh-lee-jong
Icy Zhong	冰种	bing zhong	bing-jong
Icy to Sticky-Rice Zhong	冰糯种	bing nuo zhong	bing-nwoh-jong
Sticky-Rice Zhong	糯种	nuo zhong	nwoh-jong
Pea Zhong	豆种	dou zhong	doh-jong
Ceramic Zhong	瓷地	ci di	tssee-dee

Appendix A, Chinese trade names

Yellow-Green 黄加绿	Colour: Mottled green and yellow	
Lavender-Green (*)春带彩	Colour: Mottled green and purple	
Lavender	Colour: Various degrees of violet or purple with sometimes a bluish tint.	
Fu Lu Shou"福祿壽", symbolising fortune, prosperity, and longevity)	Colour: Mottled green, yellow, and purple.	
Floating Flowers 飘花	Blue or green thread-like or cottony omphacite inclusions, creating various graceful colour patterns.	
Silkie (Black skin and bones Chicken) 乌鸡种	Graphite or metallic mineral inclusions. Graphite occurs as bandings, clouds or scattered particles, resembling Chinese ink wash paintings.	
Glassy Zhong	Transparency: Transparent Texture: Extra fine	

Hte Long Sein 铁龙生	Colour: Intense, evenly distributed green. Transparency: Semi-translucent Texture: Relatively fine to relatively coarse	
Opaque Green 干青	Colour: Green, with light to very light tone Transparency: Semi-translucent to opaque	
Sky Blue天空蓝	Colour: Bluish green Transparency: Transparent to semi-transparent Texture: Extra fine to fine	
Fei (Chinese Character "翡")	Colour: Yellow, orangish red to red	
Inky-Black墨翠	Colour: Over-saturated colour appears black under reflected light and green under transmitted light. Transparency: Semi-translucent to opaque	

Icy Zhong	Transparency: Transparent to semi-transparent Texture: Extra fine	
Icy to Sticky-Rice Zhong	Transparency: Semi-transparent Texture: Fine	
Sticky-Rice Zhong	Transparency: Translucent Texture: Fine to relatively fine	
Pea Zhong	Transparency: Semi-translucent Texture: Relatively coarse to coarse	
Ceramic Zhong	Transparency: Opaque Texture: Relatively fine	

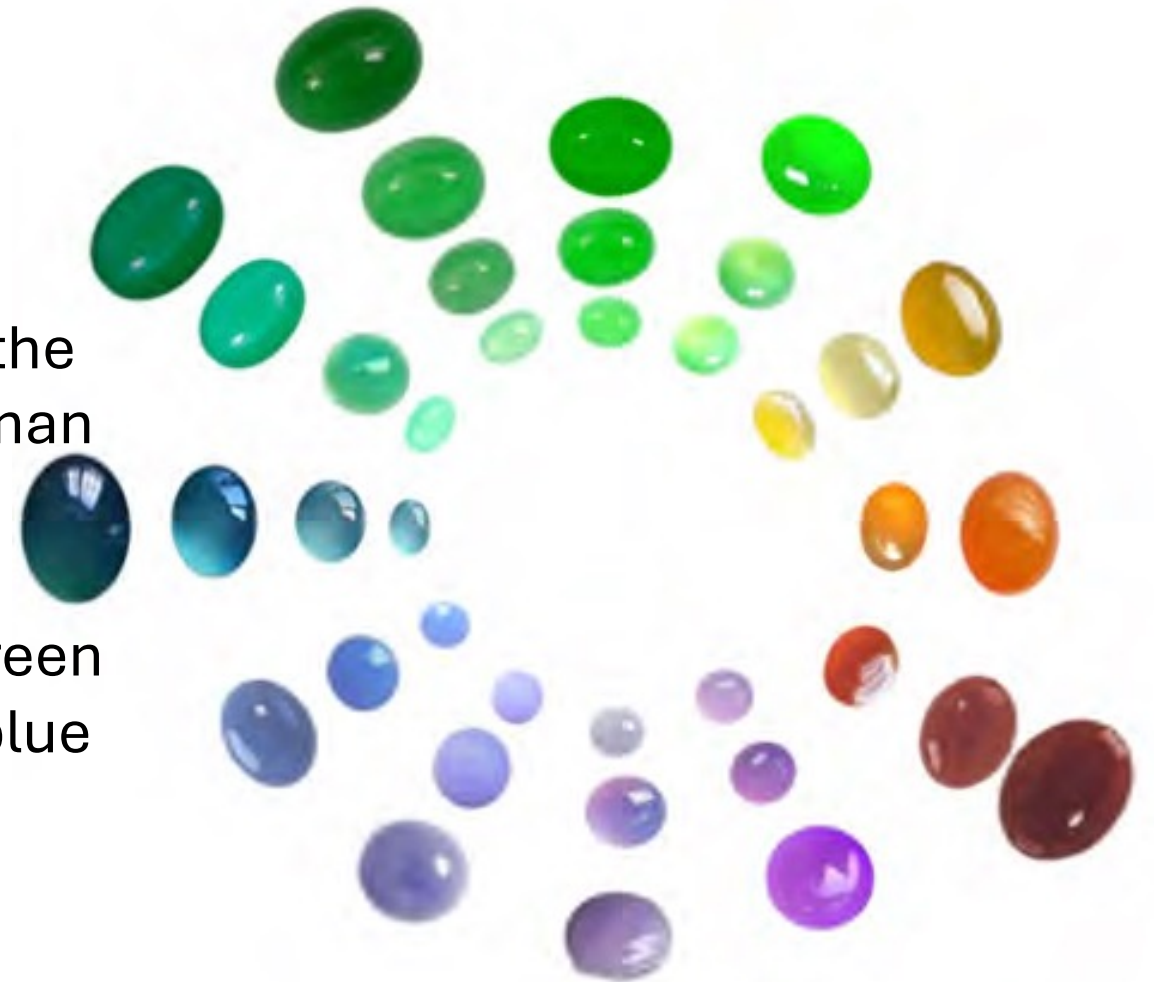
In the Chinese market, trade colour terms play a key role in the classification and pricing of Fei Cui. Expressions such as "Imperial Green" (帝王绿) and "Purple" (紫罗兰) or lavender are widely used to describe desirable qualities, blending visual appeal with market tradition.





1. Colour

Fei Cui is colour-rich and exhibits nearly the full range of colours perceived by the human eye, including both achromatic hues and chromatic hues. Fei Cui is commonly classified into colourless-white fei cui, green fei cui, purple fei cui, red–yellow fei cui, blue fei cui, and black fei cui.



Transparency and Texture (ZHONG, 种)

In addition to its rich colors, another crucial factor behind the enduring appeal of fei cui is its transparency and texture (In Chinese trade, this is referred to as ZhongShui (种水), often abbreviated simply as Zhong (种)), which together impart a sense of 'vitality.'



4.3 Evaluation

Fei Cui is usually evaluated based on its color, transparency, texture, clarity, and craftsmanship. Generally, it is necessary to comprehensively consider these factors for evaluation (Beili 2013. ; China 2009)

4.3.1 Colour

Colour of fei cui can be measured using the attributes hue, saturation and tone. The distribution of colour is an additional important attribute of fei cui.

In this Guide, green fei cui will serve as a reference for evaluating other colours..

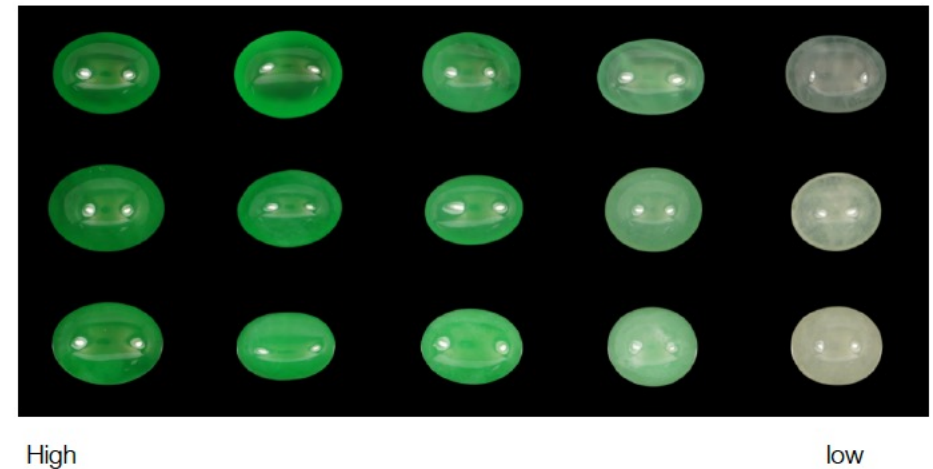
4.3.2 Hue |

Hue refers to the dominant colour of fei cui, serving as its distinctive primary characteristic among chromatic colours.



4.3.3 Saturation

Saturation refers to the strength or weakness of the colour.



4.3.4 Tone

Tone refers to the lightness or darkness of any colour of fei cui. In terms of tone, we describe all colours as light, relatively light, relatively dark, or dark. In the trade, the lighter the tone is, the better the quality is thought to be.. (Rewrite)

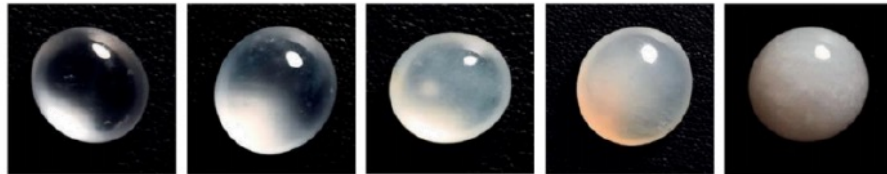


Light

Dark

4.3.5 Transparency

Transparency refers to the degree to which fei cui allows visible light to pass. It is assessed by the level of difficulty to observe objects that are placed behind a fei cui. The transparency of fei cui is determined by various factors, such as its mineral composition, texture, colour and clarity. The thickness and polishing quality of the sample may also affect its transparency.



Transparent

Semitransparent

Translucent

Semitranslucent

Opaque

4.3.6 Texture

Texture refers to the complex characteristics of fei cui including size, shape, distribution and inter-grain relationship and other factors of the mineral grains that constitute the fei cui.



Extra
Fine

Fine

Relatively
Fine

Relatively
Coarse

Coarse

4.3.7 Distribution

Colour distribution in fei cui ranges from even to uneven and may appear in flocculent patterns, spots, threads, veins, nets, or patches.



Fully colour



Spots



Nets



Threads



Veins



Patches

4.3.8 Clarity

Clarity refers to the presence of internal and external features and their type, size, quantity and location that affect the overall beauty and/or durability of fei cui.

Spotty Inclusions



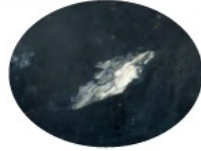
Spotty inclusions in fei cui, which can appear white, off-white, yellow, brown, or black.

Flocculent Inclusions



Cotton or silk-like inclusions in fei cui, which can appear white, off-white, brown, or black.

Cleavages



Spots or patches of reflections coming from the mineral faces, small fractures or cleavages.

Graining



Paralleled structure that formed by well-oriented tabular, elongated or platy mineral crystals, known as "stone grain"

Fissures



The cracks that occur when the continuity and/or integrity of the crystals in Fei Cui are damaged.

Notch



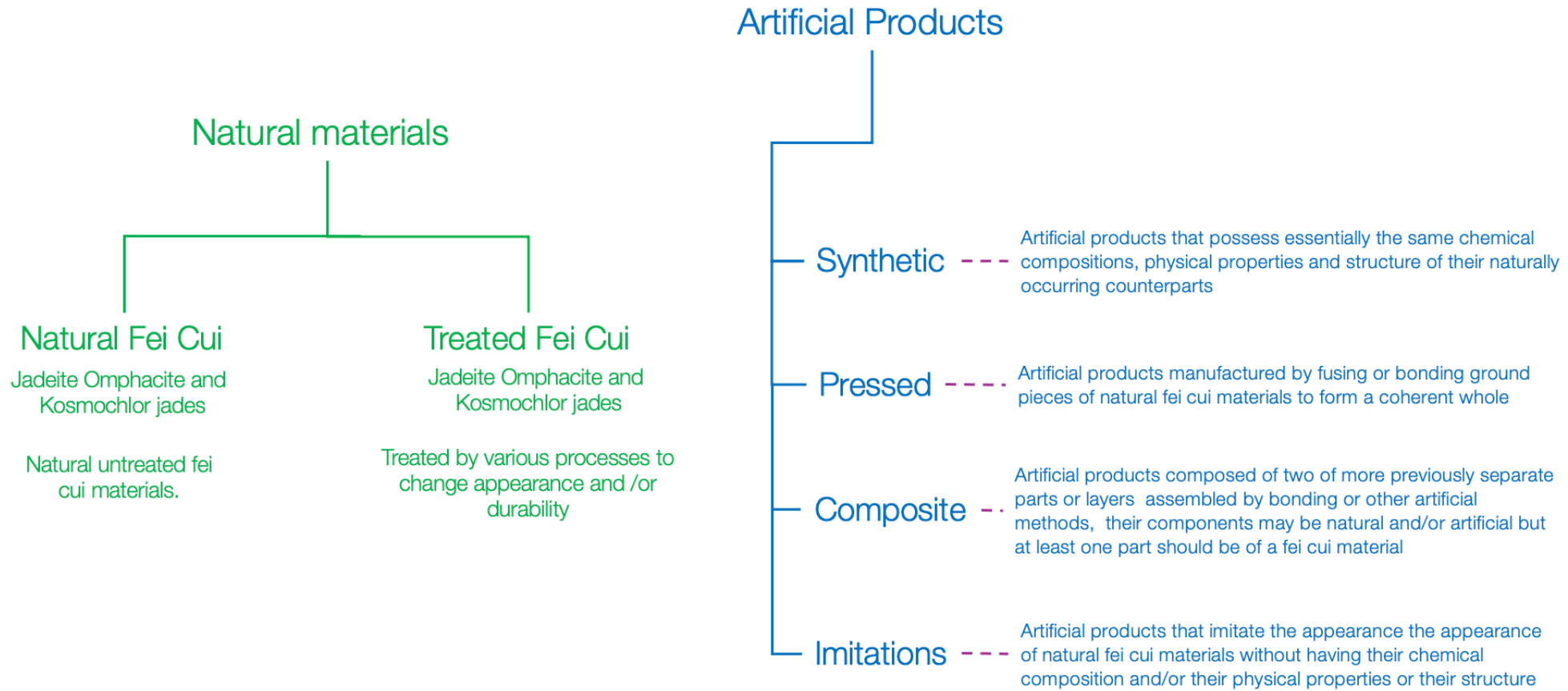
Small damaged openings on the surface of Fei Cui

4.4 Craftmanship

The evaluation of craftsmanship in Fei Cui finished products can be considered from two main aspects: material application and design, and processing techniques. Material application and design include the appropriate selection and utilisation of Fei Cui raw materials as well as the artistic design. Processing techniques include cutting, carving, and polishing. A fine Fei Cui finished product is characterised by proper material selection, harmonious proportions, elegant form, and fine workmanship. Artisans shall take into account the stone's texture and colour distribution to ensure that the design is consistent with its natural characteristics, a principle known as 'tailored artistry'.



Natural, treated and artificial products chart



4.6 Jadeite / Fei Cui Artificial Products

4.6.1 Synthetic jadeite jade

Synthetic jadeite jade (Cao et al. 2008; Nassau and Shigley 1987; Pough 1985; F. B. Wang, Li, Y., Chen, N., Jia, X.P., Ma, H.A. 2014; Wei et al. 2004) has been produced experimentally and was available as a research sample. It is primarily composed of polycrystalline aggregates of synthetic jadeite. The High-Temperature and High-Pressure (HTHP) method is the prevailing technique for synthetic jadeite jade (synthetic fei cui). Under certain conditions, the precursor materials undergo phase transformations and melting, eventually crystallizing into synthetic jadeite jade. Experimentally various colours have been created (L. Zhao, Maa, H., Fangb, C., Dinga, L., Jiaa, X. 2018; L. Zhao, Ma, H., Fangy, C., Ding, L., Liu, B., Jia, X. 2019).

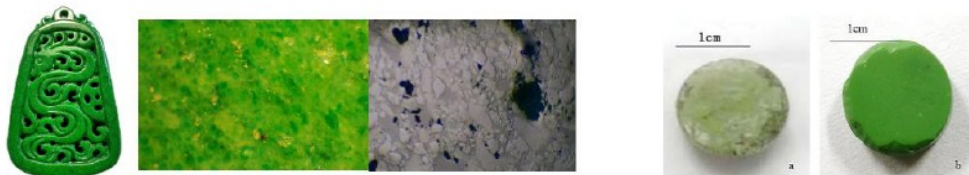
While synthetic jadeite jade (synthetic fei cu) is produced via the HTHP method, it has a chemical composition nearly identical to that of natural jadeite jade (fei cui), there are notable differences in appearance and certain spectroscopic characteristics.



Examples of synthetic jadeite jade (synthetic fei cui)

4.6.2 Pressed Jadeite jade/Fei Cui

Pressed jadeite jade/fei cui (Xiangjun 2002) is created by solidifying mechanically crushed natural jadeite/fei cui using adhesive agents, combined with compression or sintering techniques, often with added pigments. The adhesive agents are categorized into two types: organic resin binders and inorganic glass binders. Early pressed jadeite jade/fei cui primarily used resin binders, while more recent methods have adopted inorganic glass materials in the sintering process.



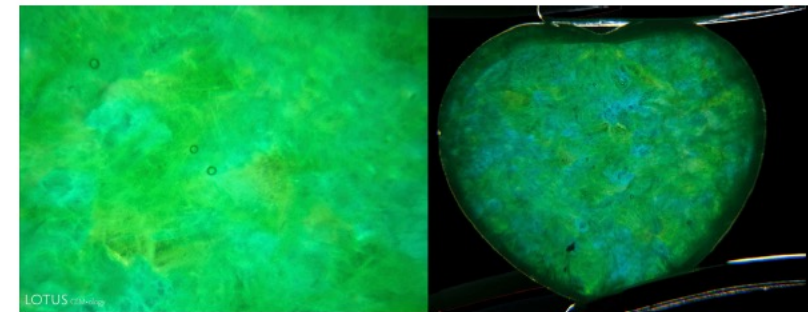
Examples of pressed fei cui

4.6.3 Composite imitations of fei cui

4.6.3.1 Finished goods

Composite imitations of fei cui refer to an artificial assembly of two or more pieces (doublets or triplets) of fei cui and bonding agents, designed to give the illusion of a single, intact piece. Such composites may be found in the trade and should be declared as such (CIBJO 2024).

Colourless fei cui may be combined with green artificial materials to imitate the appearance of high-quality fei cui (Crowningshield 1964). Another common method involves slicing dark green fei cui into thin layers and bonding them with colourless, transparent materials to enhance colour, brightness and translucency.



This heart-shaped jadeite cabochon (right) is actually hollowed out to near-eggshell thickness so that the colour appears bright and lively. To protect it, the back is filled in with resin. Such stones are normally bezel set with a closed backing to hide the fraud. Left: Round gas bubbles are visible in the resin backing under magnification. Photos © Richard W. Hughes

4.7 Possible Treatments of Fei Cui / Jadeite Jade

With the continuous expansion of the jadeite/fei cui market and increasing consumer demand, treatment methods have been developed in the jadeite jade/fei cui industry. These methods can significantly impact the colour appearance, and transparency of the material, thereby giving the original material a more appealing appearance.

These methods may improve the appearance and/or the durability of the material. However, they may also have an impact on perceived values, therefore, full disclosure of any applied treatments is crucial in ensuring that consumers and traders are fully informed.

In the fei cui trade in China, a standardised code system has been established to indicate whether a Fei Cui item has undergone any form of treatment. This declaration system is widely adopted and commonly used across the industry to inform and protect potential buyers.

- Untreated, natural jadeite/fei cui is described as **Type A**.
- Bleached and Impregnated jadeite/fei cui is described as **Type B**.
- Dyed jadeite/fei cui is described as **Type C**.
- Bleached, impregnated and dyed jadeite/fei cui is described as **Type B+C**

The standardised code system commonly used to inform buyers in China of the natural or treated state of fei cui

Type of Fei Cui	Code	Definition
Natural Fei Cui (with/without waxing)	Type A (A貨/A玉)	Refers to natural Fei Cui that exhibits its natural colour and shows no evidence of impregnation. The application of colourless wax for surface enhancement is an accepted practice and may still be considered natural Fei Cui.
Bleached and Resin Impregnated Fei Cui	Type B (B貨/B玉)	Refers to Fei Cui, which has been bleached with strong acids and resin impregnated.
Dyed Fei Cui	Type C (C貨/C玉)	Refers to Fei Cui which has been treated with dye
Bleached, Resin Impregnated and Dyed Fei Cui	Type B+C (B+C貨/B+C玉)	Refers to Fei Cui which has been bleached with strong acids, resin impregnated and dyed.

It is the position of CIBJO that it is in the best interest and responsibility of the trade for consumers to be fully informed with regards to any treatments applied to jadeite/fei cui. Treatments may impact value, and are often not permanent or may require special care; the seller shall therefore inform the purchaser about the treatment and any special care requirements. The CIBJO Trade Code (as the name implies, these codes are for the trade only and **shall not** be used with consumers) system to describe treatments indicated in the paragraphs below applies to all gemstones and not just fei cui.

The CIBJO Trade Codes that may apply to fei cui

CIBJO Trade Code	Treatment disclosure for the consumers
B	Bleached
C	Coated
D	Dyed
H	Heated
I	Impregnated
W	Waxed

4.7.1 Surface waxing

Jadeite/fei cui is cleaned using acids and neutralizing solutions, followed by boiling in water to remove any residue. Next, it is dipped in wax as part of the polishing process. The wax fills tiny fissures and pits on the surface of the jadeite/fei cui, giving it a more uniform and polished appearance. Should be disclosed as “waxed” with the CIBJO trade code “W”.



4.7.2 Heating

Heating is used to enhance the colour of jadeite/fei cui, especially in stones with a yellow or brown appearance. The process facilitates the oxidation of iron oxide impurities present between the jadeite and/or omphacite grains of fei cui, resulting in a vibrant reddish-brown colour. While heating can improve the uniformity of jadeite/fei cui’s colour, excessive heat may cause fractures and compromise its structural integrity (Chen 2008). Should be disclosed as “heated” with the CIBJO trade code “H”.

4.7.3 Dyeing



The colour of jadeite/fei cui can be altered by dyeing. Dyeing jadeite/fei cui may produce green, yellow, purple, or even multi-coloured appearances. However, the colour achieved through dyeing is unnatural and prone to fading with prolonged exposure to sunlight (Crowningshield 1963, 1965; Ehrmann 1958; Fryer 1983, 1984b, 1984a; Koivula 1982; Lu 2012; Yuan and Yan 2009). Should be disclosed as “dyed” with the CIBJO trade code “D”.

4.8 Sources

4.8.1 Myanmar

Myanmar is located on the eastern prolongation of the Himalayan orogenic system. From west to east, it comprises the four major tectonic domains: the Indo-Burma Range, the West Burma Block, the Mogok Belt, and the Shan Plateau. The Myanmar jadeite/fei cui mines are located at the eastern edge of the West Burma Block in a complex association with the Sagaing Fault and the boundary of the Jade Mine Tract with the Nanyaseik Uplift. The fei cui Mine Tract is exposed in the western boundary of the Sagaing Fault in the Hpakan area of Kachin State and mainly consists of jadeitite-bearing serpentinite mélange, glaucophane schist, mica schist, diopside marble, and amphibolite. Jadeitite mostly occurs as veins or blocks in serpentinitized peridotites or as boulders in drainages and conglomerates in the jadeite/fei cui Mine Tract.

4.8.2 Guatemala

Jadeite/fei cui occurs in tectonic serpentinites of the Motagua fault zone in Guatemala. Fei Cui is the product of fluid-mediated crystallization and/or metasomatism, and the formation of deposits is related to plate tectonic subduction zones. Guatemalan fei cui was first discovered north of the Motagua River Valley, mined from primary deposits or from scattered boulders in the rivers. The primary deposits occur in serpentinite mélanges as vein or tectonic inclusions, showing a jadeite-albite-serpentinite transition zonation. The distribution range of Guatemalan fei cui extends from the Baja Verapaz Department to the Zacapa Department, spanning 110 km on the north side of the Motagua River Valley. The occurrence extends east to the Izabal Department, which is located in the northeastern part of the Motagua fault zone and is a newer jadeite mining location.

4.8.3 Russia

The main sources for jadeite/fei cui are the Western Sayan Ridge, the Polar Urals, and Chukotka, Russia. In Western Sayan Ridge, the Kashkalak jadeite ore body, occurs in the Borus ultramafic body. This ultramafic body is associated with the massive early Cambrian serpentine suite. Most of the bodies have been subjected to intense metamorphism and are metasomatized by low-temperature mineral assemblages. In the Polar Urals, jadeite ore bodies are hosted on the west of the Syum-Keu body, and jadeite mineralization is controlled by two fractures distributed in serpentinitized peridotite.

4.8.4 Japan

The largest source of jadeite/fei cui in Japan is the Itoigawa region and surrounding areas (Asahi Town, Otari Village, and Hakuba Village). Jadeite has also been discovered in the Wakasa area (Tottori Prefecture), Asahikawa City and Horokanai Town in Hokkaido, and the Chichibu and Yorii areas (Saitama Prefecture), as well as in seven other locations.

Nephrite Jade (Hetian Yu 和田玉)



A set of Qing Nephrite Jade (Qing Hetian Yu, 青玉) ewer and cups, carved with an entwined floral design, by master carver Yu Ting

Nephrite jade is a gemmological term referring to an ornamental mineral aggregate (rock) predominantly composed of the amphibole group minerals tremolite and actinolite, often with minor amounts of other minerals, with dense interlocking fibrous crystal matrix, which gives it exceptional toughness, making it highly resistant to breakage and ideal for fine carving. Chemically, nephrite jade is a calcium-magnesium-iron silicate with the formula $\text{Ca}_2(\text{Mg,Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$. It has a Mohs' hardness of 6 to 6.5, a density of 2.95 (+0.15, -0.05) g/cm³, and a refractive index of 1.606 to 1.632 (+0.009, -0.006). Its texture ranges from smooth to waxy, with a greasy to glassy lustre, transparency from opaque to translucent, and clarity from fair to extremely clean. Nephrite jade occurs in a wide range of colours - from creamy white, highly valued in the trade as "*Mutton Fat Nephrite Jade (Mutton Fat Yu, 羊脂玉)*" to various tones of green, yellow, brown, black, and purple. A notable yellowish or reddish brown surface "skin", prized in the trade, often develops on *Pebble Nephrite Jade* formed naturally into pebble-like forms through prolonged river transport and environment oxidation. Nephrite jade's fine fibrous texture, remarkable toughness, and greasy lustre with a high polish, gives nephrite jade a subtle and enduring beauty making it a treasured material in both art and tradition.

4.9 Classification

In gemmology, and in line with cultural and trade conventions, nephrite jade is often classified according to its colour and deposit types (China-National-Standard 2020)

4.9.1 Colour

The colour of nephrite jade is primarily determined by its main mineral components—tremolite and actinolite—along with their chemical composition. These amphibole minerals are responsible for producing the base hues of white and green, commonly referred to as primary colours. Additional colours such as yellow, red, brown, and black are typically the result of secondary minerals, trace elements, or alteration processes, and are thus known as secondary colours.

This classification is based not only on predominant body colour but also on the distribution of colour, the presence of mixed hues, partial inclusions, and degrees of transparency—all of which influence the overall visual and market perception of the nephrite jade.

White nephrite jade, known in Chinese as Bai Hetian Yu, typically exhibits a predominantly white body colour, occasionally accompanied by subtle hues of green, yellowish green, yellowish brown, pinkish red, or purple. The most esteemed type is referred to in the trade as “Mutton Fat Nephrite Jade” (Mutton Fat Yu), celebrated for its lustrous, translucent, creamy-white appearance and exceptionally fine texture. This distinctive quality arises from a high magnesium content and a low presence of iron.

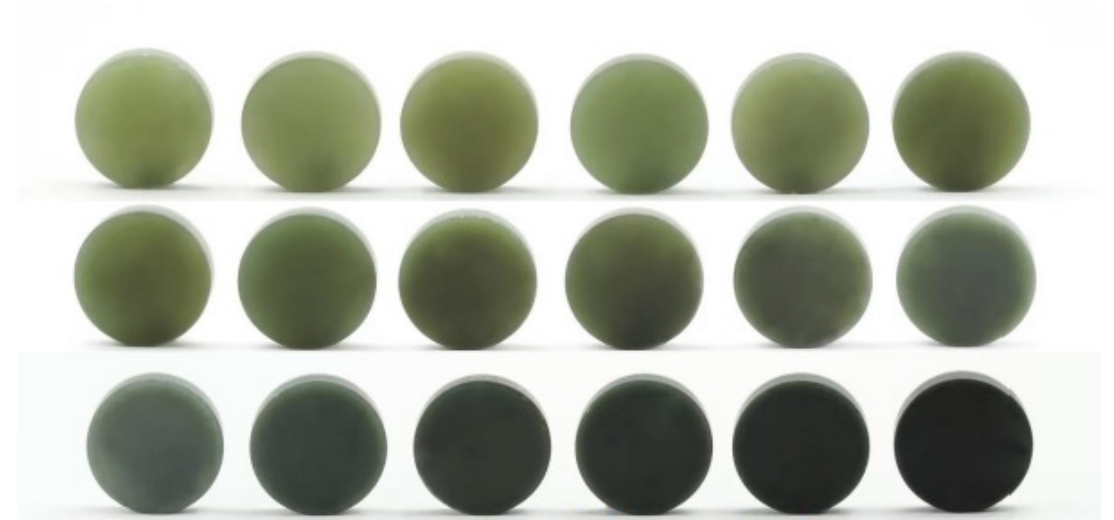


Mutton fat nephrite jade (Mutton fat yu)



White nephrite jade (Bai Hetian Yu) samples from NGTC

Green nephrite jade exhibits a range of hues from light to dark green, with differing levels of colour saturation. It may also show subtle secondary hues like grey, yellow, or blue, influenced by trace elements such as iron, chromium, and nickel.



Qing Hetian Yu samples from NGTC



Bi Hetian Yu samples

Cuiqing Hetian Yu (翠青)
presents a light to relatively
light vivid green hue,
attributed to chromium
content. The green areas
typically cover no less than
5% of the stone's surface and
are commonly interspersed
with white nephrite jade,
creating a striking contrast.



4.11 Possible Treatments Nephrite Jade

It is in the best interest and responsibility of the trade for consumers to be fully informed with regards to any treatments applied to Nephrite Jade. Treatments may impact value, and are often not permanent or may require special care; the seller shall therefore inform the purchaser about the treatment and any special care requirements.

4.11.1 Surface waxing;

Filling minor fissures to conceal natural cracks and improve surface lustre. Over time, the wax may wear off, causing the fissures to reappear. Should be disclosed as “waxed” with the CIBJO trade code “W”.



4.11.2 Bleaching:

Using acidic solutions to remove dark inclusions such as spots, dendritic ("grass-like") patterns, or linear black, brown, and dark brown colours ; can also whiten brown nephrite jade to produce a flawless appearance. Should be disclosed as “bleached” with the CIBJO trade code “B”.



4.11.3 Dying

Altering the colour appearance, commonly to imitate natural pebble nephrite jade by producing yellowish brown or reddish brown hues, and sometimes green, black, or other colours. Should be disclosed as “died” with the CIBJO trade code “D”.



4.11.4 Coating

Applying a relatively thick, colourless or coloured layer onto the polished surface of nephrite jade to enhance the lustre of otherwise porous or lower-quality material. Should be disclosed as “coated” with the CIBJO trade code “C”.

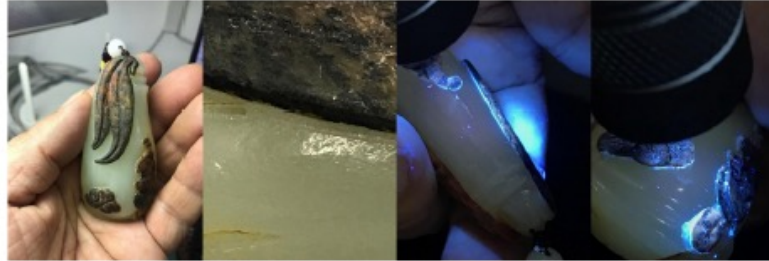


4.12 Nephrite Jade Artificial Products

4.12.1 Composite nephrite jade

Composite nephrite jade refers to objects assembled from two or more pieces of nephrite jade, or from two or more different materials, one of which includes nephrite jade.

In the market, it is common to encounter so-called "pebble nephrite jade" with small "windows" of exposed white material, while the rest remains covered by natural-looking skin. Upon closer examination, these exposed areas are often found to be thin slices or pieces of high-quality white nephrite jade artificially adhered onto low-quality nephrite jade base—or even onto non-nephrite jade materials such as quartzite, marble, or serpentine. In such cases, the main body consists primarily of inferior materials, with genuine nephrite jade comprising only a small portion.



4.13 Imitations of nephrite jade

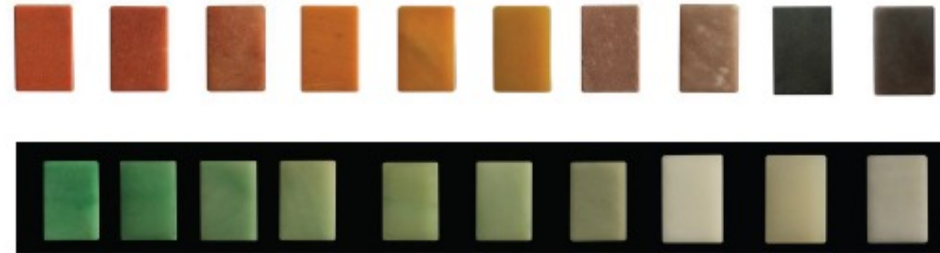
In the market, imitations of nephrite jade made from glass are commonly seen, typically in colours such as white, green, and yellow. Some are further treated with artificial "pores" and dyed to mimic the appearance of pebble nephrite jade.



Nephrite jade imitations

Other Yu (玉) Species

Aside from fei cui, jadeite and nephrite jade, various species of Yu are available in the market, favoured for their vibrant colours or fine textures (Anonymous 2017). It is important to note that the term jade shall not be used in conjunction with any of the following described yu, the term jade being restricted to jadeite or nephrite only.



4.15 Quartzite Yu

(<https://www.mindat.org/min-51087.html>)

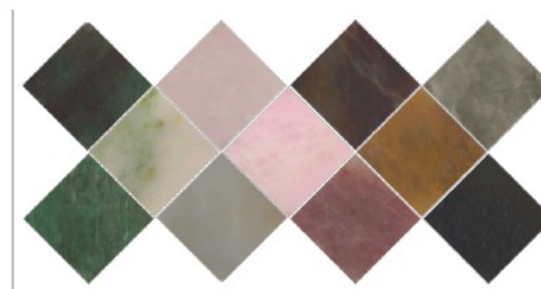
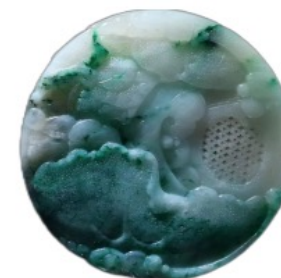
Mineral	Quartz, with minor hematite, goethite, mica, and clay minerals.
Colour	Yellow, red, white, green, black, blue
Lustre	Glassy, greasy
Transparency	Transparent to opaque
Mohs' hardness	6 to 7
Specific gravity	2.53 to 2.72
Refractive index	1.53 to 1.55
Texture	Cryptocrystalline structure, phanerocrystalline structure



4.17 Serpentine Yu

(<https://www.mindat.org/min-260.html>)

Mineral	Serpentine, with possible calcite, talc, and magnetite.
Colour	Green, white, black, yellow, blue
Lustre	Glassy, waxy
Transparency	Semi-transparent to opaque
Mohs' hardness	2.5 to 6
Specific gravity	2.44 to 2.80
Refractive index	1.56 to 1.57
Texture	Fibrous granular structure



4.16 Dushan Yu

(<https://www.mindat.org/min-96.html>
and <https://www.mindat.org/min-3885.html>)

Mineral	Plagioclase and zoisite, with chromian muscovite and actinolite as constituents.
Colour	Yellow, red, white, green, black, blue
Lustre	Glassy, greasy
Transparency	Semi-transparent to opaque
Mohs' hardness	5.5 to 7
Specific gravity	2.70 to 3.09
Refractive index	1.56 to 1.70
Texture	Fibrous granular structure, crystalloblastic texture, metasomatic texture

APPENDIX D – Amphibole & Pyroxene Nomenclature

APPENDIX B – Misnomers for Jade

After Schluessel, R. (2022) Glossary • Jades & lookalikes. In *Jade • A Gemologist's Guide*, Edited by Hughes, R.W., Bangkok: Lotus Publishing, pp. 480–485. With edits.

See also (Galopim-de-Carvalho 2024)

Misnomers often arise because something was named long before its correct nature was known, or because an earlier form of something has been replaced by a later form to which the name no longer suitably applies

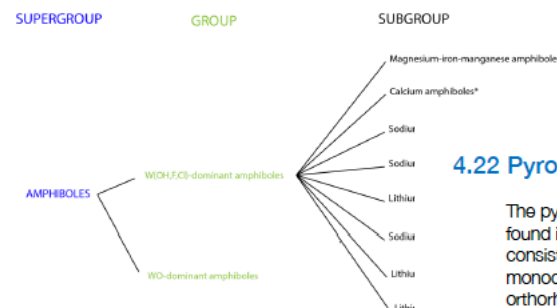
Afghanistan (Afghan) Jade: Off-white to greenish yellow bowenite (serpentine variety); term also used for untreated marble.

also called green idocrase or californite.

Andes Jade: Serpentine
Andesine Jade: Massive andesine feldspar.

4.21 Amphibole

An extensive and complex group of minerals presently divided into a group/subgroup/root-name hierarchy. The amphibole group remains under study with the most recent, IMA-approved nomenclature being published in 2012 (Hawthorne 2012).



The supergroup-group-subgroup hierarchy of the amphibole group

4.22 Pyroxene

The pyroxenes (Px) are a group of important rock forming inosilicate minerals found in many igneous and metamorphic rocks. They share a common structure consisting of single chains of silica tetrahedra. Pyroxenes that crystallize in the monoclinic system are known as clinopyroxenes and those that crystallize in the orthorhombic system are known as orthopyroxenes.

The name *pyroxene* is derived from the ancient greek words for 'fire' and 'stranger'. Pyroxenes were so named due to their presence in volcanic lavas, where they are sometimes found as crystals embedded in volcanic glass; it was assumed they were impurities in the glass, hence the name meaning "fire stranger". However, they are simply early-forming minerals that crystallized before the lava erupted.

APPENDIX C – Trade or Commercial names for Jade

See also (Galopim-de-Carvalho 2024)

amphibole jade Jade gem varieties essentially composed of polycrystalline aggregates of fibrous amphibole minerals, notably in the tremolite-actinolite isomorphous series (nephrite).

ancient jade Old trade name for nephrite jade used to make axes in the Neolithic. Same as axe jade or axian jade.

axe jade Old trade name for nephrite jade used to make axes in the Neolithic. Same as axian jade or ancient jade.

axian jade Old trade name for nephrite jade used to make axes in the Neolithic. Same as axe jade or ancient jade.

B.C. jade Trade name for dark green nephrite jade from British Columbia, Canada.

botryoidal, shape that resembles a grape-like eternal structure. Same as bubble jade.

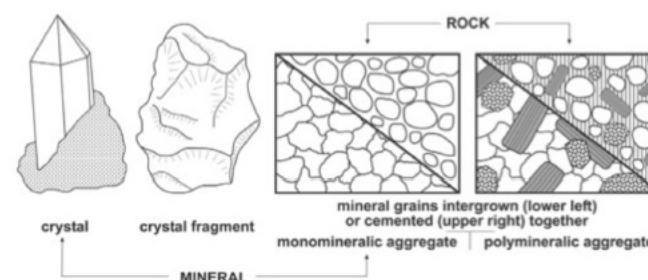
bubble jade nephrite jade rough with a globular, or botryoidal, shape that resembles a grape-like eternal structure. Same as botryoidal jade.

California jade white to black to various tones of green nephrite jade and, to a lesser extent, pyroxene jade from California, USA.

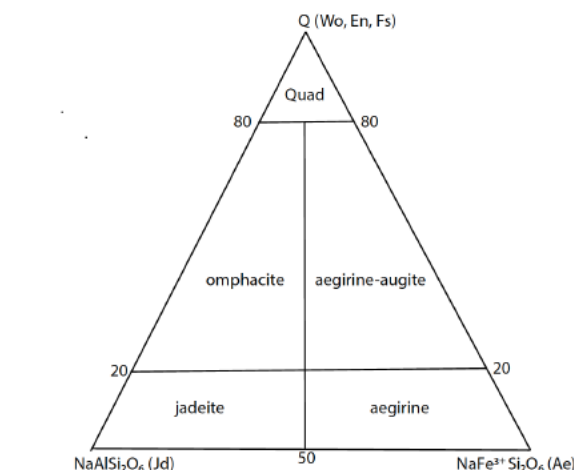
Canadian jade dark green nephrite jade from British Columbia, Canada.

cat's-eye jade a green to yellow chatoyant variety of actinolite-tremolite from Taiwan. Similar-looking material occurs in Canada. Technically it is not a jade and is also known in the trade as Taiwan cat's eye.

APPENDIX E – Distinction between Mineral and Rock.



From: Harrell, J.A. (2025) *Archaeological Stones and Their Macroscopic Identification*. Oxford: Archaeopress, 284 pp.;



Ca-Mg-Fe and Na pyroxenes with accepted names. Quad represents the Ca-Mg-Fe pyroxene area.

APPENDIX F – CAUTION the perpetration of dishonest schemes or attempted frauds).

Over what may be centuries there have been numerous reported instances of incorrectly described “gem materials” that prey upon the gullibility or greed of those without gemmological knowledge. These include describing materials as historically important (ancient) and being exceedingly rare and therefore (by implication very valuable), when in fact they are merely imitations, synthetics or very low quality treated materials.

Fei cui, with its long history, particularly in the East, has been misrepresented in various manners over the years and in today’s market it is not unknown for resin impregnated and dyed fei cui to be described as the finest quality historic gems by the uneducated, ignorant or unscrupulous, who prey on the unwary.

An example scenario

So called “Ming (1368–1644) and Qing (1644–1912) dynasties jadeite/fei cui” (明清老翡翠) has in recent times been featured at expositions in Hong Kong, in auction claims, and across social/video platforms, where the material described and imaged is of an unnatural colour, modern appearance and appears to be impregnated and dyed. The promotion of such items often with exaggerated claims surrounding “Ming/Qing (or other dynasties) old jadeite/fei cui” is driven by mistaken/ignorant marketing and, in some cases, deceptive practices.

Scientific Verification: Well established gemmological laboratories are equipped to identify bleached and impregnated as well as dyed jadeite with, amongst other things, infrared spectroscopy.

Expert Warnings: Reputable institutions emphasize that authentic Ming/Qing jadeite/fei cui is extremely rare, typically housed in museums or major collections—not circulating in expos, online platforms, or private auctions.





Progress continues
and a launch during
the 2026 CIBJO
Congress is expected.

Thank you

