

December 24, 2025



Cut 8X

Growth Method	CVD
Chemical Vapor Deposition (CVD)	Highly controlled environment, allowing for precise control over growth parameters such as temperature, pressure, and gas composition.
Molecular Beam Epitaxy (MBE)	Ultra-high vacuum conditions, enabling the growth of extremely pure and defect-free films.
Pulsed Laser Deposition (PLD)	High energy density laser source, facilitating the deposition of complex materials and structures.
Sputter Coating	Relatively simple process, suitable for large-scale production, but often results in higher defect densities compared to CVD or MBE.
Atomic Layer Deposition (ALD)	Self-limiting reaction mechanism, ensuring atomic-level thickness control and excellent conformality.
Hydrothermal Synthesis	Aqueous solution-based process, typically resulting in nanoscale structures like nanotubes or nanowires.
Sol-gel Process	Low-temperature processing, often used for depositing oxide thin films.
Electrodeposition	Simple and scalable technique, commonly used for depositing metallic coatings.
Langmuir-Blodgett (LB) Transfer	Enables the transfer of monolayers or ultrathin multilayers from liquid surfaces onto solid substrates.
Spin Coating	Rapid and uniform deposition method, widely used for depositing polymer and organic thin films.
Dip Coating	Simple process involving immersion of the substrate in a precursor solution followed by withdrawal at a controlled rate.
Layer-by-Layer (LbL) Assembly	Sequential deposition of alternating layers of complementary charged polymers or nanoparticles.
Self-Assembly	Natural process where molecules spontaneously organize into ordered structures under specific conditions.
Bio-inspired Growth	Utilizes biological templates or processes (e.g., mineralization) to synthesize nanostructures.
Epitaxial Growth	Involves the growth of a crystalline film on a single-crystal substrate, maintaining lattice continuity.
Heteroepitaxy	Growth of a material with a different crystal structure than the substrate, often leading to strained-layer epitaxy.
Organic Vapor Phase Epitaxy (OVPE)	Similar to CVD, but uses volatile organic precursors, often used for growing carbon nanotubes or graphene.
Chemical Solution Deposition (CSD)	Solution-based process where the precursor reacts in situ to form the desired material.
Thermal Evaporation	Simple process involving heating a solid source to evaporate the material, which then deposits on a substrate.
E-beam Evaporation	Uses a focused electron beam to heat the source material, achieving higher evaporation rates and purities.
Magnetron Sputtering	Common industrial technique for depositing conductive and insulating films.
RF Sputtering	Utilizes radio frequency power to sputter non-conductive targets.
DC Sputtering	Uses direct current power, typically for conducting targets.
Plasma-enhanced Chemical Vapor Deposition (PECVD)	Combines CVD with plasma activation, allowing for lower growth temperatures.
Atomic Layer Etching (ALE)	The reverse of ALD, removing material layer-by-layer with atomic precision.
Vapor-Liquid-Solid (VLS) Growth	Used for synthesizing one-dimensional nanostructures like nanowires.
Surface-Mediated Growth	Involves the initial nucleation of a phase on a surface, followed by bulk growth.
Interfacial Reaction	Growth occurs at the interface between two different media, driven by diffusion and reaction.
Exfoliation	Process of separating individual layers from a pre-existing layered material.
Top-down Fabrication	Starting from a larger bulk material and patterning it down to the desired nanostructure.
Bottom-up Fabrication	Building up the nanostructure molecule-by-molecule or atom-by-atom.
Biological Synthesis	Leveraging living organisms or their components to synthesize functional nanostructures.
Mineralization	Natural process where minerals precipitate from aqueous solutions, often forming biominerals.
Electrochemical Synthesis	Using electrical potential to drive redox reactions and synthesize materials.
Photodeposition	Using light to initiate a chemical reaction that deposits a material onto a substrate.
UV Irradiation	Can induce various chemical processes, including cross-linking of polymers or degradation of materials.
Gamma Radiation	High-energy radiation used for cross-linking polymers or inducing specific chemical transformations.
Ion Implantation	Injecting ions into a solid material to modify its properties or create doped regions.
Ion Beam Assisted Deposition (IBAD)	Combining ion beam bombardment with evaporation or sputtering to enhance adhesion or modify morphology.
Neutral Beam Assisted Deposition (NBAD)	Similar to IBAD, but uses neutral atoms instead of ions for assistance.
Flame Spray Pyrolysis (FSP)	High-throughput synthesis of nanoparticles in a flame reactor.
Microfluidics	Controlled mixing and reaction of fluids at small scales, enabling precise synthesis of nanomaterials.
Continuous Flow Synthesis	Automated process where reactants flow continuously through a reactor system.
Batch Synthesis	Traditional method where all reactants are added simultaneously to a reaction vessel.
Flow Chemistry	General term encompassing continuous flow synthesis techniques.
Supercritical Fluid Extraction (SFE)	Using supercritical fluids (like CO ₂) to extract or separate components from a mixture.
Supercritical Drying	Prevents capillary action-induced collapse of delicate porous structures during drying.
Supercritical Antisolvent Precipitation (SAPO)	Used for precipitating powders from supercritical solutions.
Supercritical Water Oxidation (SCWO)	Efficient destruction of organic waste in supercritical water.
Supercritical Water Gasification (SCWG)	Conversion of organic feedstocks into syngas in supercritical water.
Supercritical Fluid Chromatography (SFC)	Separation technique using supercritical fluids as mobile phases.
Supercritical Fluid Fractionation (SFFF)	Fractionation of mixtures based on solubility differences in supercritical fluids.
Supercritical Fluid Extraction (SFE)	Using supercritical fluids to selectively extract compounds from a matrix.
Supercritical Fluid Impregnation (SF-I)	Impregnating porous materials with active substances using supercritical fluids.
Supercritical Fluid Polymerization (SFP)	Conducting polymerization reactions in supercritical environments.
Supercritical Fluid Cracking (SFCr)	Cracking heavy hydrocarbons in supercritical fluids.
Supercritical Fluid Hydrogenation (SFH)	Performing hydrogenation reactions in supercritical fluids.
Supercritical Fluid Nitration (SFN)	Performing nitration reactions in supercritical fluids.
Supercritical Fluid Sulfonation (SFS)	Performing sulfonation reactions in supercritical fluids.
Supercritical Fluid Halogenation (SFHal)	Performing halogenation reactions in supercritical fluids.
Supercritical Fluid Amination (SFA)	Performing amination reactions in supercritical fluids.
Supercritical Fluid Alkylation (SFAk)	Performing alkylation reactions in supercritical fluids.
Supercritical Fluid Isomerization (SFI)	Isomerizing molecules in supercritical fluids.
Supercritical Fluid Cyclization (SFCy)	Performing cyclization reactions in supercritical fluids.
Supercritical Fluid Polymerization (SFP)	Performing polymerization reactions in supercritical fluids.
Supercritical Fluid Copolymerization (SFCop)	Performing copolymerization reactions in supercritical fluids.
Supercritical Fluid Grafting (SFG)	Grafting polymer chains onto surfaces in supercritical fluids.
Supercritical Fluid Crosslinking (SFCx)	Crosslinking polymers in supercritical fluids.
Supercritical Fluid Degradation (SFD)	Degrading polymers or other materials in supercritical fluids.
Supercritical Fluid Purification (SFPur)	Purifying substances in supercritical fluids.
Supercritical Fluid Separation (SFSep)	Separating mixtures in supercritical fluids.
Supercritical Fluid Extraction (SFE)	Extracting compounds from solids in supercritical fluids.
Supercritical Fluid Fractionation (SFFF)	Fractionating mixtures in supercritical fluids.
Supercritical Fluid Impregnation (SF-I)	Impregnating porous materials in supercritical fluids.
Supercritical Fluid Polymerization (SFP)	Polymerizing monomers in supercritical fluids.
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Supercritical Fluid Impregnation (SF-I)	Impregnating porous materials in supercritical fluids

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Ultimate Diamond Cut Grade



P Poor **F** Fair **G** Good **VG** Very Good **EX** Excellent

Technical drawing of a diamond showing its proportions and angles. The drawing includes the following dimensions and angles:

- Top width: 9.69mm
- Top width (excluding pavilion): 5.85mm 60%
- Top width angle: 35.5°
- Left side height: 0.37mm 3.8%
- Left side height (excluding pavilion): 5.86mm 60.5%
- Right side height: 1.35mm 14.0%
- Right side height (excluding pavilion): 4.14mm 42.5%
- Bottom width: 0.03mm 0.3%
- Bottom angle: 40.2°

DIAMOND SHAPES



CARAT WEIGHT SIZES

Carat Weight	2.50	2.00	1.50	1.00	0.75	0.50
Approx. Size						
Diameter	8.60mm	8.00mm	7.30mm	6.40mm	5.80mm	5.10mm

DIAMOND CLARITY GRADING SCALE

FL	IF	VVS1	VVS2	VS1	VS2	S11	S12	I1	I2	I3
FLAWLESS - INTERNALLY FL.		VERY VERY SLIGHTLY		INCLUDED/VERY SLIGHTLY INCLUDED		SLIGHTLY INCLUDED				INCLUDED/PIQUE

DIAMOND COLOR GRADING SCALE



D - Z DIAMOND COLOR GRADING SCALE

DIAMOND FLUORESCENCE GRADING SCALE



DIAMOND POLISH & SYMMETRY GRADING SCALE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
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BRILLIANT CUT DIAGRAM



BUY WITH
CONFIDENCE

GCAL BY SARINE™
4Cs GRADING GUARANTEE

The GCAL by Sarine™ philosophy is simple: we believe consumers should feel confident about their lab grown diamond purchase, in the same way we believe experts should be accountable and stand behind their work.

This is why your lab grown diamond is protected by a zero tolerance, money-backed grading guarantee. You should know that the GCAL by Sarine™ 4Cs Grading Certificate is the only 4Cs grading certificate in the world that comes with a guarantee that ensures the accuracy of the certified lab grown diamonds' weight and quality grades. If the carat weight or any of the cut, color, or clarity grades provided in this GCAL by Sarine™ 4Cs Grading Certificate is lower than the weight or quality grade of your certified lab grown diamond, GCAL by Sarine™ will reimburse you the difference between what you paid for the lab grown diamond and the current fair value of an equivalent lab grown diamond in the market in which it was purchased, pursuant to the newly established grades. Kindly see additional details, including the limitations of the guarantee, at GCALUSA.com.

MISSION STATEMENT

To provide the most accurate and consistent gemological grading, with uncompromising integrity and unparalleled customer service.

GEMPRINT®

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GUARANTEED
CERTIFICATE



LAB GROWN



8X® is the highest achievement in precision diamond cutting. The GCAL 8X Ultimate Diamond Cut Grading System encompasses all aspects of diamond CUT quality assessment. Your lab Grown diamond has achieved grades of Excellent in all eight aspects of CUT quality assessment. As a result, this lab grown diamond is recognized for its extraordinary brilliance and beauty.

PHYSICAL EXCELLENCE

The first three of the 8X grading factors analyze the exactness of the physical surface, the facet shapes, as well as the angles. This includes the Polish, External Symmetry and Proportions.

Decades of the meticulous mathematical calculations have determined the narrow proportions ranges required to produce superior cut diamonds. Each shape has been studies individually to find the most aesthetically pleasing parameters. Some of the factors considered are listed below.

To view the proportions specifications for each shape, please visit our website GCALUSA.COM

Table %	Lower Girdle facet Length
Depth %	Star Length
Crown Angle/Height	Girdle Thickness
Pavilion Angle/Height	Culet Size

LIGHT PERFORMANCE EXCELLENCE

The next three of the 8X grading factors are Brilliance, Fire and Scintillation, which analyze the light handling ability of your lab grown diamond. The combination of these factors is the essence of what makes any diamond visibly shine, dance and sparkle from across a room. Fire and Scintillation are graded while the diamond is in motion and interacting with the light. View the Fire and Scintillation videos of this lab grown diamond at the GCALUSA.com or by scanning the QR code on this certificate.

OPTICAL EXCELLENCE

The last two 8X grading factors consider optical excellence. These factors scrutinize the craftsmanship, the precise alignment of the crown and the pavilion facets, the shape outline, and the length to width ratio, ensuring the lab grown diamond achieves aesthetic perfection.

Grading scales for each of the 8X grading factors can be viewed at GCALUSA.com

Independently Graded and Guaranteed by GCAL by Sarine™