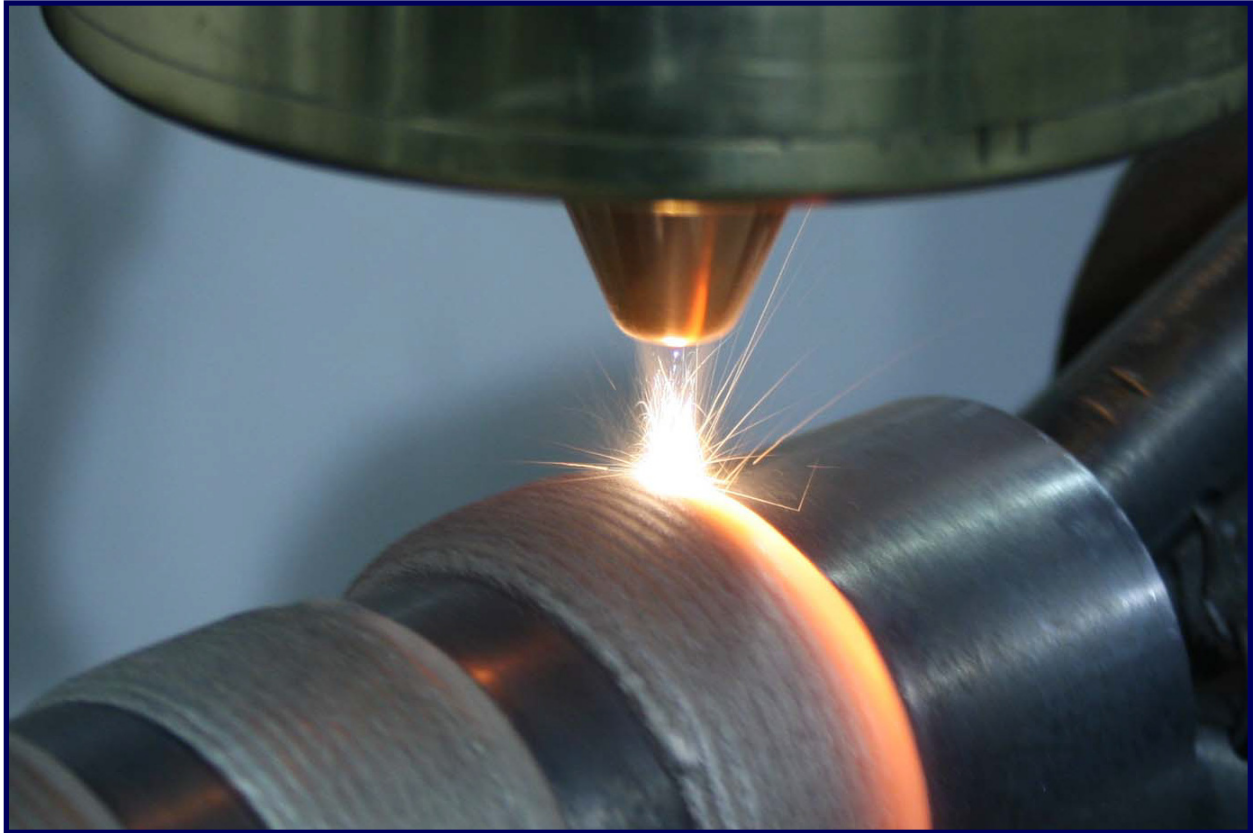


IntegriCladd® Laser Coatings Capabilities



Laser Cladding Services LTD employs proprietary laser processes, **IntegriCladd®**, for applying various metal coatings as described in the list below. We are dedicated to extending the life of your high wear, high mortality components.



IntegriCladd® Laser Coatings List

IntegriCladd®2001

Inconel 600 – Nickel based Super-alloy

- Ni-Cr-Fe alloy exhibiting resistance to corrosion and heat
- Desirable combination of high strength and good workability
- Used in applications from cryogenic to above 2000 F
- Used in chemical and heat-treating industries, aeronautical field, electronic field and is standard material for nuclear reactors

IntegriCladd®2002

Inconel 625- Nickel based Super-alloy

- Ni-Cr-Mo alloy with excellent crevice corrosion, pitting, and high temperature oxidation resistance; suitable for service in severe environments
- Maintains high strength and toughness in temperatures up to 1500 F and clads to a hardness of 25-30 HRC
- Used in aerospace, power generation, chemical processing, oil and gas extraction, and seawater services

IntegriCladd® Laser Coatings Capabilities

IntegriCladd®2003

Inconel 690- Nickel based Super-alloy

- High chromium (29%) Ni-Cr-Fe alloy exhibiting resistance to many oxidizing corrosive aqueous media and high temperature atmospheres
- Applications include nuclear steam generators as well as sulphuric, nitric, and nitric/hydrofluoric acid processing

IntegriCladd®2004

Hastelloy® C-22 Nickel Alloy

- Versatile Ni-Cr-Mo alloy with excellent corrosion resistance to wet chlorine and mixtures containing nitric acid or oxidizing acids with chloride ions; also offers resistance to process streams with reducing and oxidizing properties
- Laser cladding provides a dense, crack-free, metallurgically-bonded surface that protects the substrate and will not spall
- Hardness in the range of 40-45 HRC

IntegriCladd®2005

Inconel 718- Nickel based Super-alloy

- Age and precipitation harden-able Ni-Fe-Cr alloy with excellent corrosion and oxidation resistance and superior weldability; maintains excellent strength up to 1800 F
- Widely used in aerospace, oil and gas extraction, and power generation
- Ideal for thick build-up on valve components prior to hardfacing

IntegriCladd®2006

Hastelloy® C-276 Nickel Alloy

- Ni-Mo-Cr alloy with excellent corrosion resistance to localized corrosion to oxidizing and reducing media
- Clads to a hardness of 35-40 HRC
- Used in the chemical industries due to its excellent resistance to pitting and stress-corrosion cracking
- Used in flue gas desulfurization systems because of its excellent resistance to sulfur compounds found in scrubbers

IntegriCladd®2007

Colmonoy® 5

- Nickel based-based hardfacing alloy with chromium boride
- Hardness range of 45-50 HRC
- Applications include wear rings, plungers and dies

IntegriCladd®2008

Colmonoy® 88

- Unique alloy contains Nickel with chromium tungsten borides and carbides for excellent abrasion and corrosion resistance
- Used in high temperature, highly abrasive applications
- With hardness in the range of 59-64 HRC it is used in pump plungers and sleeves, valve seats and extrusion screws

IntegriCladd®2009

Self-fluxing Nickel Alloy

- Wear resistant Ni-Cr-Si-B coating with hardness up to 60 HRC; good resistance to abrasion, erosion, friction and corrosion
- Coatings are very dense with excellent metallurgical bonding
- Recommended for use on base materials with a fairly high coefficient of thermal expansion, and also recommended for corrosion environments

IntegriCladd®2010

Hastelloy® B

- Ni-Mo alloy with excellent resistance to hydrochloric acid at all concentrations and temperatures
- Withstands hydrogen chloride, sulfuric, acetic and phosphoric acids
- Excellent resistance to pitting and stress corrosion cracking
- Used in chemical process applications in the as-cladded condition

IntegriCladd®3000

316 Austenitic Stainless Steel

- Ideal for thick build-up and re-manufacturing of low-alloy steel mechanical components with enduring high stresses
- No cracking, no porosity, no deformation
- Fully machinable (30 HRC) with high chromium & nickel contents for good corrosion resistance
- Withstands attack by many chemicals and solvents; inhibits pitting caused by chlorides



IntegriCladd®3001

431 Martensitic Stainless Steel

- Ideal for crack-free wear-resistant build-up over low alloy steel mechanical components enduring high stresses
- Laser-clad version finishes hardness up to 52 HRC, much higher than spray or weld applied coatings (30-40 HRC)
- Good combination of corrosion resistance, hardness, and toughness
- High Chromium (16%) and low Carbon (0.2%) contents provide good oxidation resistance at high temperatures

IntegriCladd®4001

Stellite® 1

- Cobalt-based alloy with excellent abrasion resistance and good corrosion resistance
- Maintains properties and hardness up to 1470 F
- Applications include pump sleeves and expeller screws

IntegriCladd®4002

Stellite® 6 Cobalt Alloy

- General purpose alloy effective against corrosion, erosion, and cavitation
- Co-Cr-W alloy provides excellent self-mating, anti-galling properties
- Laser cladding provides the hardness range of 46-50 HRC, and the hardness maintained at high temperatures

IntegriCladd®4003

Stellite® 21

- Cobalt based alloy with excellent high temperature strength
- Combats to galling, cavitation, erosion and corrosion with toughness Used extensively in the forging industry
- Laser cladding results in hardness in the range of 37-42 HRC

IntegriCladd®4005

Ultimet® Cobalt Alloy

- This Co-Cr-Ni-Mo alloy offers corrosion resistance comparable to Hastelloys as well as wear resistance (especially against cavitation erosion, slurry erosion, and galling) comparable to Stellite® alloys
- Laser cladding results in hardness of 30-50 HRC material can be work harden to 53 HRC
- Can be mixed with tungsten carbide to fight abrasion and severe corrosion phenomena

IntegriCladd®4006

T-800 Cobalt Alloy

- This Co-Mo-Cr alloy features a hard inter-metallic laves phase in a softer matrix; can reach hardness 60 HRC and resist wear and galling up to 1825 F
- Resists crevice corrosion and stress corrosion cracking better than austenitic stainless steels

IntegriCladd®5000

Titanium Grade 2

- The most widely used Titanium in the industry providing good balance of strength and ductility
- Excellent corrosion resistance in highly oxidizing environments
- Excellent weldability
- Applications include aircraft construction, heat exchangers, pumps and valves

IntegriCladd®5001

Aluminum-Bronze

- Versatile material widely used for bearing surfaces or to resist fretting and cavitation
- Can be laser clad onto bronze, cast iron, and steel
- A variation of this coating exhibits excellent erosion, cavitation, and corrosion properties for use in high-performance marine engineering applications

IntegriCladd®7000

H13 Tool Steel

- Ideal for crack-free build up of hot forming tools and dies; can be used for tool temperatures up to 1000 F
- The most widely used hot work tool steel; provides good balance of toughness, high temperature strength, and wear resistance
- Laser-clad application provides highest possible hardness up to 57 HRC



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IntegriCladd® Laser Coatings Capabilities

IntegriCladd®7054

CPM-9V® Tool Steel

- This powder metallurgy version of AISI A11 tool steel contains less carbon and vanadium to improve toughness and creep resistance
- Provides improved wear resistance and toughness over D2 cold work tool steel due to its vanadium carbide content
- Laser-clad process results in homogeneous and high hardness up to 54 HRC deposit compared to conventional wrought and cast products
- Can be used to improve forging and extrusion tooling operation up to 1000 F

IntegriCladd®7060

Durmat® 505 Tool Steel

- This powder is a version of AISI tool steel provides superior wear resistance while maintaining toughness similar to that of D2 and M2 steels
- Contains 10-11% fine primary vanadium carbides for as-clad hardness of 58-60 HRC
- Offers twice the wear life of chromium carbide
- Typical services include stamping, forming tools, knives, slitters, and wear plates

IntegriCladd®7065

VimCru®20 Bearing Steel

- Cobalt-free high molybdenum super high speed steel designed for critical bearing services
- Excellent high temperature hardness and brinelling resistance
- Laser-clad process results in dense, crack-free deposit with hardness range of 63-65 HRC with uniformly distributed carbides for excellent wear resistance

IntegriCladd is a register trademark of Laser Cladding Services, LTD. Houston, Texas.

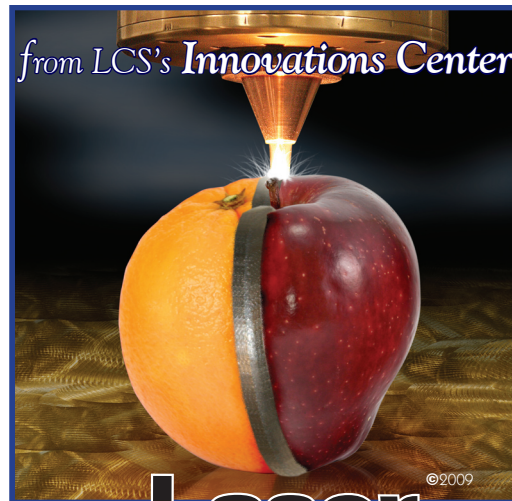
IntegriCladd®8000

Tungsten Carbide Composites

- Consists of 60% fine spherical tungsten carbide grains (hardness 3000 HV) homogeneously dispersed in a 40 HRC self-fluxing nickel matrix
- Withstands extreme sliding abrasion and can be ground for bearing applications
- Proven to outlast nickel-base, cobalt-base, and chromium carbide weld overlays by a factor of 10
- Nickel matrix can be substituted with H13 tool steel (for abrasion and impact resistance), Stellite® 6 (for anti-galling) and Ultimet® (for extreme corrosion)

NOTE 1: These are some of the typical coatings LCS currently utilizes. There are many others that can be specified for special applications.

NOTE 2: The information listed here is typical, and these are considered general guidelines. The performance and utilization vary depending upon the application.



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