Sai Surface Coating Technologies
Advanced Surface Modification Technologies

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Sai Surface Coating Technologies

www.ssct.in

M/S. Sai Surface Coating Technologies (SSCT) specializes in surface modification techniques and precision machining technologies. Based at Hyderabad (INDIA), we have diverse surface modification technologies spanning Detonation spray process, High velocity oxy-fuel (HVOF) process, Plasma spray, Flame spray, Wire arc, Spray and Fuse processes, Plasma Ion Nitriding and Hard facings etc, in addition to wide-spread utility precision machining and grinding facilities at our specially equipped site enabling us to offer our customers a one-stop shop service for every engineering requirement.

PROFILE

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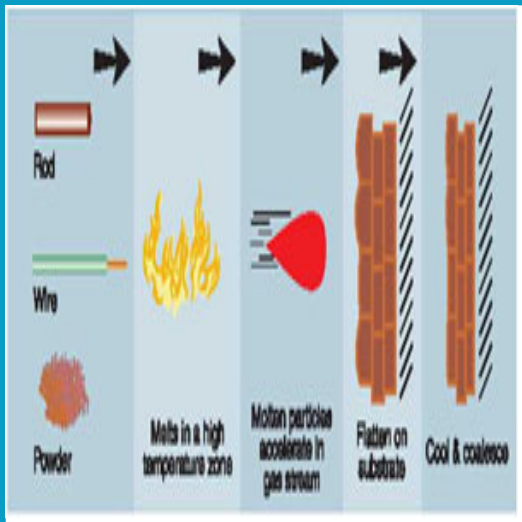
In all our work, whether it is a Surface modification requirement, a state of the art machining, or a component refurbishment, we offer a good deal of quality and customer service that are unique and quite simply unsurpassed. With a wide-spread utility of most popular Surface modification technologies such as Thermal Spray Coatings, Gas Nitriding and Hard Facings coupled with unparalleled surface engineering expertise, we lead the market by offering the customer the most effective solutions and timely service.

SSCT is managed and run by a committed Technical team comprising of experienced Engineers in this field. The Team is totally committed to promote the Surface Engineering Technology in the country, using the latest Technologies.

We started our activities in the year 2000, Situated in our own and spacious premises. Driving Force behind our success is a team of eminent Scientists from ARCI, our Technology Providers.

Promoters are well experienced, dedicated and qualified Technocrats. Run by well qualified and highly skilled / trained Technicians and Lloyd's qualified Welders.

WE SPECIALIZE IN ....



Thermal Spray

Description :

Thermal spray - Overview IMPORTANCE OF THE SURFACE MODIFICATON TEHNIQUES:

In the modern Industrial world, engineering components are prone to more rapid surface degradation due to mechanisms such as wear, oxidation, corrosion or failure under an excessive heat load. As a consequence, in an effort to achieve enhanced performance in terms of productivity, efficiency etc., surface modification technologies have been attracting a great deal of attention as they present a cost-effective way to combat degradation modes such as above without sacrificing the bulk properties of the component material. Thermal spraying is one of the most versatile coating technique and finds wide ranging applications in numerous industry sectors.

THERMAL SPRAY PROCESS

In the thermal spray processes, electrical, chemical or mechanical energy is used to produce a high velocity gas jet. The coating material is introduced into this gas jet, usually in powder form. Particle-gas interaction lead to heat and momentum transfer from the gas jet to the particles and these

accelerated particles are sprayed onto the substrate surface. On impact, thermal and kinetic energies of the particles are used for the formation of splats. These splats adhere to the substrate, and subsequently to each other to form the coating.

BENEFITS OF THERMAL SPRAY COATINGS

DIRECT COST SAVINGS

- Very dense coatings (porosity less than 1%)
- No problem of hydrogen embrittlement like Hard chrome platting
- Increase in life of component.
- Reduction in maintenance costs.
- Decrease in equipment downtime.
- Increase in operating efficiency.
- Use of less costly material for bulk of component.

DESIGN IMPROVEMENTS

- Utilization of surface design engineering.
- Extending operating range of equipment.
- Improvement of manufacturing methods.
- Use of less dense base material.
- Thermal spray processes available
- Detonation spray process

1. HOVF spray process
2. Cold spray process
3. Plasma spray process
4. Electric arc spray process
5. Powder/ Wire/ Rod Flame spray process
6. Utilization of surface design engineering.

- Extending operating range of equipment.
- Improvement of manufacturing methods.

- Use of less dense base material.

Thermal spray processes available:

- Detonation spray process
- HOVF spray process
- Cold spray process
- Plasma spray process
- Electric arc spray process

Services:

Powder/ Wire/ Rod Flame spray process:

Whether it is a Surface modification requirement, a state of the art machining, or a component refurbishment, we offer a good deal of quality and customer service that are unique and quite simply unsurpassed. With a wide-spread utility of most popular Surface modification technologies such as Thermal Spray Coatings (Detonation Gun, HVOF, Plasma, Wire arc, Flame Spray and Spray & Fuse processes), Gas Nitriding, Laser Cladding, hard facing, manufacturing and Sub Assemblies coupled with unparalleled surface engineering expertise and machining capabilities, we lead the market by offering the customer the most effective solutions, and timely service.

Surface modification on customer supplied components:

We alter working surface of the components by using thermal spray processes, Hard facings and Gas Nitriding processes. Our wide experience in this surface modification technologies helps us in delivering the appropriate surface modification technique for the customers.

Manufacturing of components along with surface modification services

We have capability of manufacturing precision and critical engineering components along with surface modifications. We can maintain inventory for any such component to reduce lead time and inventory cost at customer end. In order to satisfy customer demand, we work with a diverse and experienced supply chain beginning with raw material procurement, component manufacture, coating and finishing.

Sub Assemblies of manufactured components along with surface modification services

As one stop shop, we provide complete solutions for total assembly including manufacturing and surface modification of individual components.

Application Development

Many industries like paper, steel, plastic, printing and pumps etc., employ pronominal methods of surface modifications which lead to short and temporary solutions. Our vast experience in surface modification techniques with in-house characterization & evaluation laboratory and manufacturing techniques will help customer to develop advance solutions for addressing customer development projects. We provide advance solutions for all such applications which improve performance, life, quality and reduce process implications.

Detonation Spray Process

Description :

Detonation Spray Process

Detonation Spray system used to develop dense ceramic and carbide coatings for wear resistant coatings for Aero engine, Power, Paper, Oil & refinery Sectors.

Process description:

In Detonation spray system, an explosive high temperature flux of gas mixtures (Acetylene and Oxygen) is used as a source for heating, accelerating and spraying the powder particles. The high temperature, high velocity gas products of the detonation melt the particles and accelerate them sufficiently so that they emerge from the gun at supersonic velocities depending upon the material being sprayed and its powder size characteristics. The resulting high velocity impingement of the particles on the substrate yields very dense coatings with excellent adhesion.

This technology was developed and transferred by Advanced Research centre for powder metallurgy and new materials (ARCI), HYDERABAD.

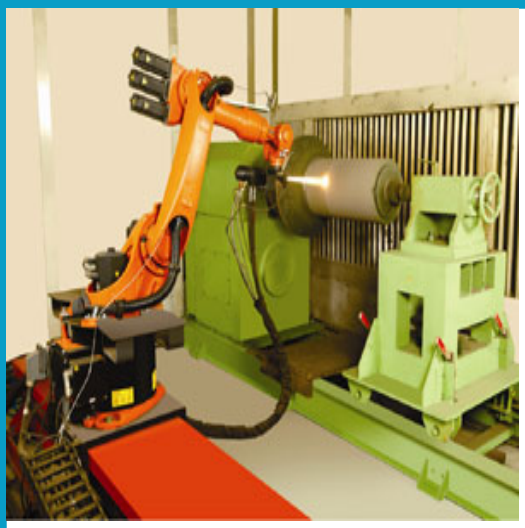
Sailent Features

- Coatings are very hard, clean and dense

- Coatings has low compressive stresses
- Coatings has very high bond strength
- Coating characteristics are superior than Flame spray, Wire arc and Plasma spray coatings

Typical Coatings:

- Anti – Wear Coatings
- Anti - Corrosion Coatings
- Metallic Coatings



Hvof Process

Description :

Hvof Process(High Velocity Oxy Fuel Spray System):

HVOF system used to develop wear resistant coatings for Aero engine, Power, Paper, Oil & refinery Sectors.

Process description:

In High Velocity Oxy Fuel (HVOF) Spray System, Continuous combustion of the oxygen and fuel gas occurs in the combustion chamber and the resulting hot, high pressure gas is allowed to expand and accelerate through orifices into the nozzle. A carefully measured flow of powder is introduced axially into the nozzle, allowing sufficient heating and acceleration of the powder particles. The powder is heated and accelerated by the products of the combustion, usually to temperatures above its melting point and to velocities approaching supersonic velocities.

Sailent Features

- Coatings are very hard, clean and dense
- Coatings has low compressive stresses
- Coatings has very high bond strength
- Coatings has high surface finish

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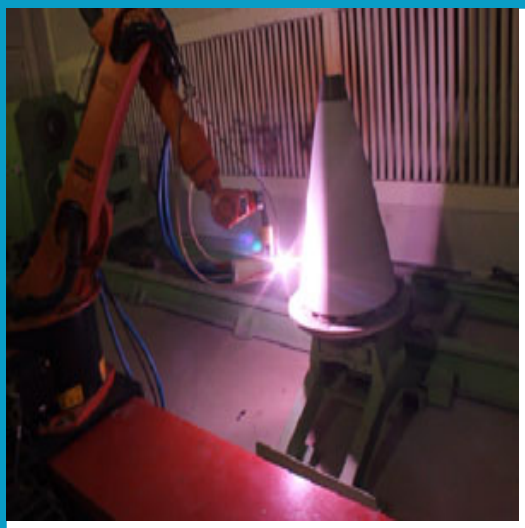


Plasma Spray process

Description :

Plasma Spray process:

The plasma spray system is versatile process in thermal spray systems and by using this system ceramics, carbides, metals and plastics can be applied onto base materials for wear and corrosion protection, electrical insulation, thermal insulation, repair, and restoration.

Process description:

In plasma spray system, an electric arc created between two fixed electrodes. Process gasses (argon, nitrogen, hydrogen, helium) flows around the cathode and through the anode which is shaped as a constricting nozzle. The plasma is initiated by a high voltage discharge which causes localised ionisation. Powder is fed into the plasma flame most commonly via an external powder port mounted near the anode nozzle exit. The powder is so rapidly heated and accelerated to deposit on work piece.

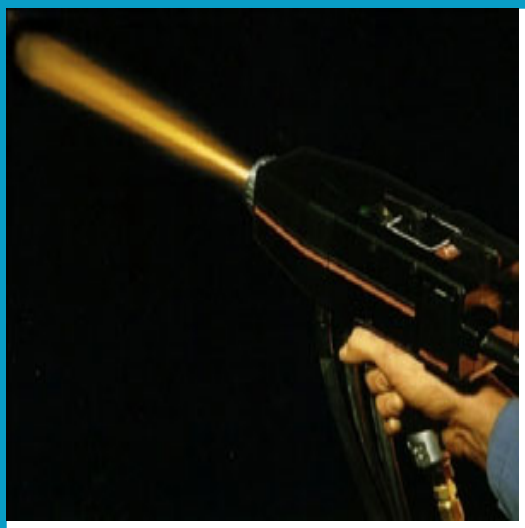
Sailent Features

- Ability to deposit refractory materials like Zirconia and Tungsten etc.
- Coating characteristics are superior than Flame spray and Wire arc spray coatings
- Coatings have high surface finish

- Excellent control of coating thickness

Typical Coatings:

- Thermal Barrier Coatings
- Electrical Insulation Coatings
- Abradable coatings
- Wear Resistant Coatings
- Anti –Corrosion Coatings
- Metallic Coatings



Electric Arc Wire Spray System

Description :

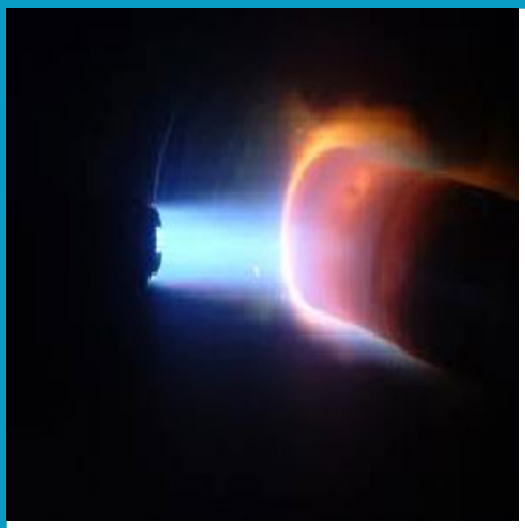
Electric arc wire spray system uses only electricity and atomized air to deposit metallic coatings.

Process description:

In Wire arc spray system, two metallic wires are fed into a "gun" where they are electrically charged with opposing polarity and directed together to create an arc. The resulting heat (Nearly 4,000°C) melts the metallic wire, forming droplets that are propelled (Particle velocity will be up to 150 m/s) by compressed air or gas onto the work piece surface to form the coating.

Powder/wire/Rod Flame Spray System:

The main advantage of Powder flame spray over the wire flame spray is that a much wider range of materials can be easily processed into powder form giving a larger choice of coatings such as metals, alloys, carbides, polymers and ceramic powders.



Spray and Fuse process

Description :

Spray and Fuse Process

Spray and Fuse coatings has virtually no porosity and bond strength comparable to welding.

Process description

Coating material in a powder form is fed into an oxygen-fuel gas combustion flame, melted and projected by the gas stream onto a prepared substrate. This process requires a fusing process after being sprayed. This is done by using a torch to bring the part up to approximately 1100 degrees Centigrade.

HORIZONTAL TIG WELDING EQUIPMENT

This Equipment very useful for carrying narrow groove welding to join thick sleeves, long tubes and to carry cladding on large components. The welding principle of this equipment is Tungsten Inert Gas Welding (TIG) principle.

Hard Facing

Description :

LASER CLADDING & HARDENING PROCESSES:

Laser cladding process utilizes a laser source to create a melt pool of the base material and cladding material is introduced into this melt pool in powder form. The energy of the laser melts the cladding material also to form alloying zone between base material and clad material resulting to a metallurgical bonding with good control on required dilution rates.

Laser hardening process is environmental friendly process which will produce very effective hardening layer compare to conventional hardening processes.

Laser cladding & Hardening Facility at SSCT:

ADVANTAGES OF LASER CLADDING PROCESS:

1. Lower dilution levels
2. Metallurgical Bond
3. Minimal heat effected Zone
4. Minimal part distortion

5. Reduced post processing
6. Highly repeatable process

ADVANTAGES OF LASER HARDENING PROCESS:

1. Very low distortion
2. No quenching requirements
3. High process rates
4. Easy case controllability
5. High process flexibility
6. Automation possible
7. No requirements of absorbent coatings

PTA PROCESS

The main advantage of PTA Welding process is low dilution levels than TIG & MIG welding processes.

Process Description

In PTA welding, two DC power supplies are used to first establish a pilot arc (non-transferred arc) between the tungsten electrode and the anodic nozzle and then a transferred arc between the tungsten electrode and the workpiece. The pilot arc is struck by an High Frequency device and the plasma gas flowing around the cathode is ionized at the electrode tip. When the transferred arc is ignited, the workpiece becomes part of the electrical circuit and the plasma arc is directed and focused through the torch orifice into the workpiece. Powder is metered, under a positive pressure of Argon flow, from the bottom of the torch into a pool of molten metal on the workpiece surface.

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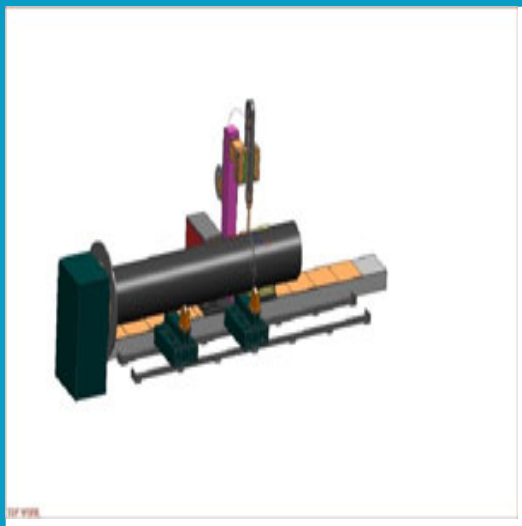

Gas nitriding

Description :

NITRIDING PROCESS:

Nitriding and Nitro carburising of steel parts give unique improvements in wear and corrosion resistance. These improvements can be understood when examining the surface microstructure and hardness after treatment

NITRIDING FACILITY AT SSCT

1. Control over the depth of the diffusion zone independent of the depth of the white layer
2. Elimination of corner effects & nitride network
3. Control over surface hardness & distortion
4. Control on surface porosity
5. Control over type of nitrides in the white layer
6. High degree of case depth & hardness uniformity
7. With post oxidation capability

BENEFICAL PROPERTIES IMPARTED BY NITRIDING:

High surface hardness and wear resistance

Anti – galling properties

Increased high temperature hardness

High fatigue strength

Improved corrosion resistance

High dimensional stability

ADVANTAGES OF SSCT FACILITY OVER CONVENTIONAL NITRIDING FACILITIES:

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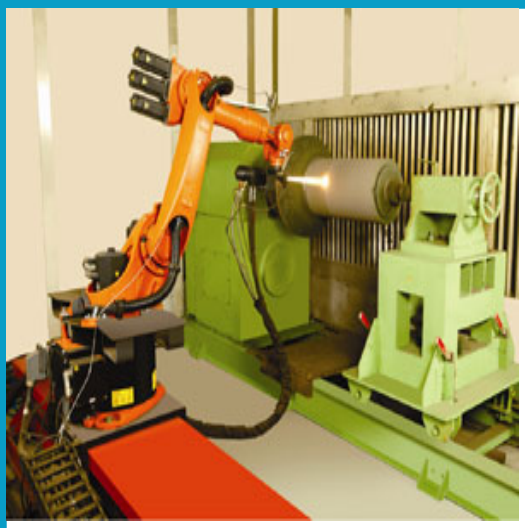

Laser cladding and hardening process

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FACT SHEET

Business Type	:	Manufacturer, Supplier, Exporter, Serviceprovider,
CEO	:	Mr Harshvardhan
Year Established	:	17/08/2019
Clients	:	Power Generation, Aero space,Paper & Print Industry,Oil & Gas Industry,Auto Mobile Industry

CONTACT US

Sai Surface Coating Technologies

Pashmylaram, Hyderabad, Telangana, India,Pashmylaram, Hyderabad, Telangana, India

Patancheru

7731950055

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