
REDSHIFT

REDSHIFT

Sustainable Innovative Green Technology!

Redshift is a mastermind of a combine think-tank of veteran organisations like Sambhav Machinery Private Limited, Indo Colchem Private Limited and Doctorate Professionals. The strong desire to conquer the horizons of diversified fields with a motto of **"Sustainable Innovative Green Technology"** is what drives Redshift.

The venture endeavours to deliver technology at the door step of the customers – a technology which is easy to absorb and ingrain. We believe in ensuring smooth functioning of our technology by passing on complete know-how to handle and operate to our clientele and not just stop with provision of our specialised patented technologies.

Redshift believes in satisfaction of the end customers. Their satisfaction is our priority and vindicates our standing and reputation. We offer complete solutions and mitigation of the challenges clients face with our technical knowledge and skills in all the areas concerning Metallurgy, Petrochemicals, Chemicals & Mechanical Machinery.

Developed in-house and patented green technology "ULSONIK" represents our strong research fundamentals, commercial viability and ethics. Redshift focuses its efforts towards continual improvement resulting into path breaking sustainable innovative green technology for clientele across industry sectors.

ULSONIK –

An INNOVATIVE GREEN APPROACH to TREAT METALS & ALLOYS METALLURGICALLY

Back Boned by Intellectual Property

Indian Patent Number: 3176/MUM/2013

"A SYSTEM TO DEVELOP, ANALYZE AND OPTIMIZE THE ULTRASONIC TECHNOLOGY"

DEGASSING

A prerequisite process for casting quality

CHALLENGES

- Porosities in macrostructure of metals and alloys castings due to dissolved gases precipitation
- Impurities like: Ca, Mg, etc. are found as inclusions in the molten metals and alloys
- Porosities and Impurities found in macrostructure of metals and alloys castings have detrimental effects on metallurgical, mechanical, thermal and electrical properties.

CURRENT TECHNOLOGIES

Vacuum Degassing

Employed in the ferrous metals and alloys industry

Rotary Degassing

Employed in the nonferrous metals and alloys industry

OPERATING PRINCIPLE

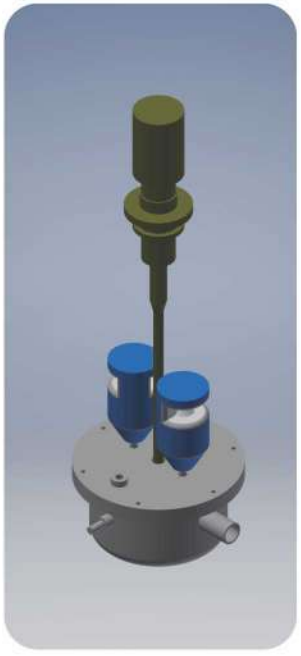
Both methods use argon, nitrogen, chlorine, and fluorine along with other hazardous gases to remove various dissolved gases and inclusions impurities

SHORTCOMINGS

- Because of the use of Fluorine, Chlorine and other gases process becomes **cumbersome and hazardous**.
- A biggest **escalator of greenhouse effects** which is in fact, 23,600 times higher as compared to COx and NOx
- **High initial cost** of auxiliaries such as gas flow regulation, metering and associated control panels
- **Limited efficiency** due to scientific physical constraints in shearing of bubbles up to certain size
- Grain refinement and Equi Axial Alloy Distribution are not feasible
- Constant loss of efficiency with deceased life of wear parts such as rotors and stators
- Consistency in the quality of degassing is highly dependent on operator's experience and skills
- High electricity consumption and higher running cost due to frequent replacement of wear parts and heating provisions
- Higher maintenance cost of separate degassing unit with heating provisions

ULSONIK CAN BE RETROFITTED IN YOUR EXISTING FACILITY…

ULSONIK



To Degasify, Purify and Refine metals and alloys with a capacity of upto 80 metric tonnes per hour…

OPERATING PRINCIPLE

- ULSONIK does not use argon, nitrogen, chlorine, and fluorine but a rich ultrasound to remove various dissolved gases and inclusions impurities from molten metals and alloys.
- ULSONIK uses high-intensity ultrasonic vibrations to generate oscillating pressures in molten aluminum. In the region of minimum pressure micron sized fine bubbles are produced which provide nuclei for dissolved gases to coalesce and flow out of the melt.

Current Technologies & ULSONIK

	Rotary & Vacuum Degassing	ULSONIK
Main element	Graphite/ceramic stator rotor	Special alloy
Operating costs	High	Low
Utilities Consumption	External gas/air	None

ULSONIK TREATED AA8011

1. DENSITY: 2.68 g/cc
2. H2 CONTENT: < 0.2 cc/100 g
3. POROSITY: <3%

ULSONIK TREATED AA1100

1. DENSITY: 2.57 g/cc
2. H2 CONTENT: < 0.4 cc/100 g
3. POROSITY: <7%

ROTARY DEGASSED AA8011

1. DENSITY: 2.55 g/cc
2. H2 CONTENT: < 0.7 cc/100 g
3. POROSITY: <8%

ROTARY DEGASSED AA1100

1. DENSITY: 2.42 g/cc
2. H2 CONTENT: < 0.9 cc/100 g
3. POROSITY: <12%

ADVANTAGES

- ULSONIK is made up of special materials with unique patented concept and design along with automatic universal degree of freedom movement for the continuous production of metals and alloys castings.
- ULSONIK can be used with vacuum, normal and positive pressure surroundings with constant higher efficiency with ease of operation.
- ULSONIK can be used either within furnace or within launders / conduits / gutters / channels /passage for metals and / or alloys to the downstream side of furnace.
- ULSONIK - A complete treatment along with highly efficient degassing to nullify the detrimental defects on quality of metals and alloys produced by porosities and inclusions impurities achievement of below objectives:

1. Reduction in large amount of Porosities to almost NIL level
2. Maximum reduction of Inclusions Impurities which exist within melt
3. Maximum enhancement of Mechanical, Metallurgical, Galvanic, Electrical and Thermal properties of metals and alloys along with Equi Axed Shape Grains with Refinement and Equi Axial Alloy Distribution.
4. Maximum savings of energy and running cost.
5. Minimum supervision and maintenance.
6. Minimum level of dross
7. Maximum safety along with ease of operation.
8. Healthy and environment friendly process.

Better Properties of Metals and Alloys Treated With ULSONIK

- Production of more finer and equi axed grains, better structure of crystallization, better distribution of alloy elements throughout the cross sections of the product, better strength to weight ratio can be achieved
- Almost NIL Porosities can be achieved
- Thermal, Electrical and Galvanic properties gain of 10-18%
- Metallurgical properties gain of 5-8%
- Mechanical properties gain of 10-20%

Applications & Benefits of ULSONIK

Application	Benefits
• Billets and slabs casting of alloys for aerospace, automotive and marine applications.	• Equi axed fine grain structure with controlled dendritic growth and equi axial alloy distribution with better proper orientation if directionally chilled. • Increased surface properties such as corrosion, erosion and pitting resistance. • Improved conductivity, hardness, fracture toughness, tensile strength and impact strength. • Increased strength to weight ratio with NIL level of porosities • NIL butt curl defect
• Foils production for Pharmaceuticals and Food Packaging Industry.	• Futile level of pin holes • Increase in tensile strength • Improved elongation • Better surface finishing

Application	Benefits
• All types of castings for all industries of metals and alloys	• Higher activation energy of melt with better fluidity • Better solidity with NIL level of porosities • Equi axed fine grain structure with controlled dendritic growth and equi axial alloy distribution • Increased surface properties such as corrosion, erosion and pitting resistance • Improved conductivity, hardness, fracture toughness, tensile strength and impact strength • Increased strength to weight ratio • Better surface finishing properties

Some Facts and Figures

- Recycled metals and alloys production is more than 18 million tonnes annually which is projected to be raised up to 31 million tonnes annually by 2020

- The gaseous fluorine compound, sulphur hexafluoride, SF6, occurs in the atmosphere at levels of about 0.3 parts per trillion. It is extremely unreactive with an atmospheric lifetime estimated at 3200 years. Current atmospheric levels of SF6 are significantly higher than the estimated background level of 0.04 ppt in 1953 when commercial production of it began. The compound is very useful in specialized applications including gas insulated electrical equipment and inert blanketing/degassing of molten aluminum and magnesium. Increasing uses of sulphur hexafluoride have caused concern because it is the most powerful greenhouse gas known, with a global warming potential (per molecule added to the atmosphere) about 23,900 times that of carbon dioxide

- Thus, the metals and alloys recycling plants use hazardous gases for production than 136 tonnes of SF6 are emitted annually

- These are equivalent to health hazardous effects of 3.3 million tons of Carbon Dioxide

- Our ULSONIK can reduce these health hazardous effects by 50% by 2020 assuming 50% plants who recycle metals and alloys using it!

Sustainable Innovation Green Technologies!

REDSHIFT ENGINEERING LLP

Plot No. 509, Phase IV, GIDC – Vatva, Ahmedabad-382 445, Gujarat, India.

info@rseng.in | www.rseng.in

+91 9016330001 | +91 9825084235

Our Associations

Sambhav Machinery Pvt Ltd
http://sambhavmachinery.in

Indo Colchem Pvt Ltd
http://www.indocol.com