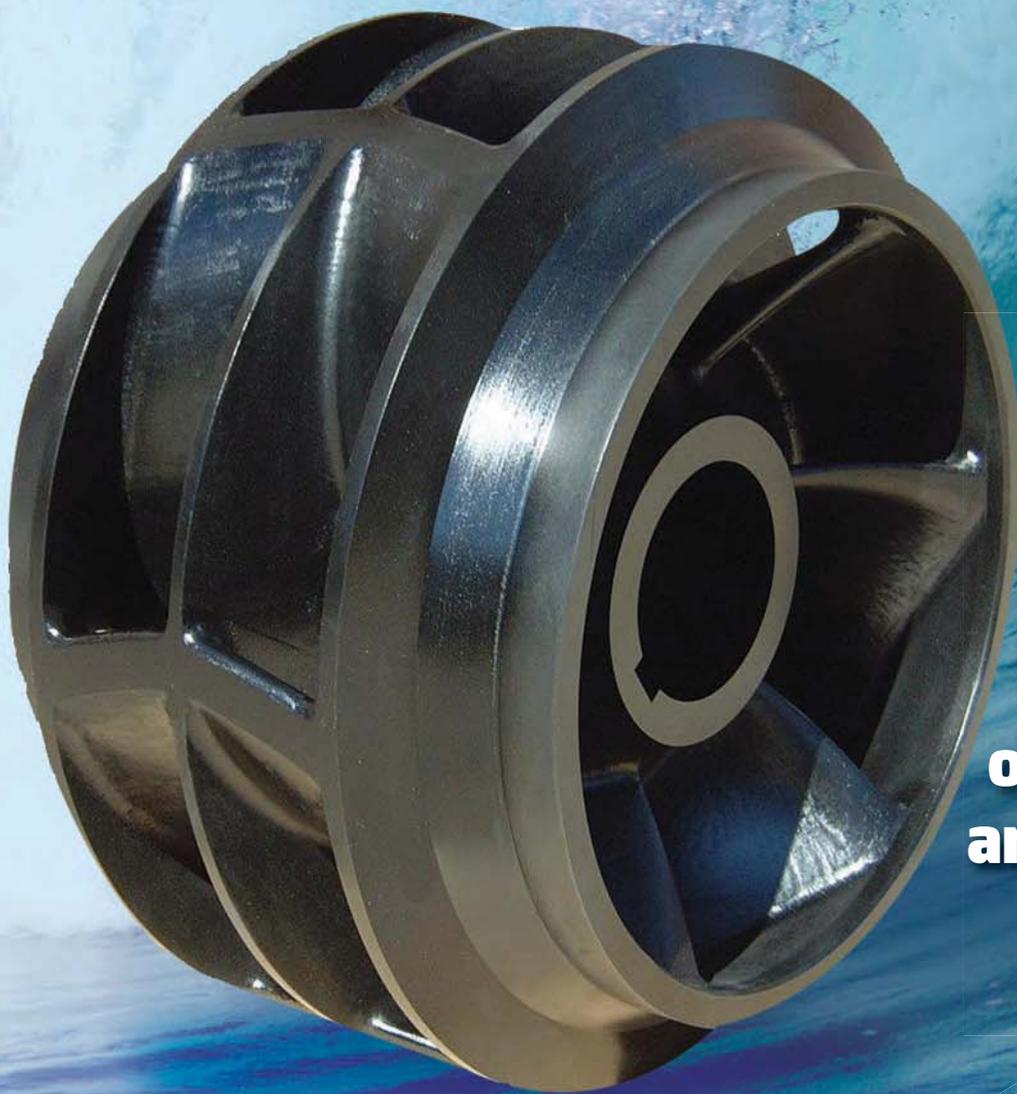


SIMSITE[®]

Impellers & Casing Rings



SIMSITE[®]

**Impellers
& Rings**

**Never
Corrode**

**in Seawater,
or Wastewater,
and will Outlast
& Outperform
ALL Others!**

***Sims* PUMP**

What is SIMSITE®?

SIMSITE® is a patented structural composite material. More specifically, it is a graphite fiber reinforced composite with a hybrid phenolic-epoxy resin system offered exclusively by the SIMS Pump Valve Company. The structural design of **SIMSITE®** is unique. Fibers are continuously interwoven in a tri-directional weave. The reinforcing fibers are all continuous for higher strength and flexibility. As a heavy-duty structural composite, its characteristics can be changed to accommodate the required structural strength of the parts being manufactured.

Trouble-free performance

Impellers machined from solid blocks of **SIMSITE®** Structural Composite are lightweight and offer tremendous mechanical strength and corrosion resistance. **SIMSITE®** has been used successfully in the manufacture of Impellers & Casing rings since 1955. **SIMSITE®** Impellers & Casing Rings outlast impellers and rings made of metals such as bronze, stainless steel, duplex stainless, or monel. **SIMSITE®** Impellers & Rings are excellent for applications where seawater, wastewater, sewage, or brackish water is present because they NEVER CORRODE! They are also ideal for use with hydrocarbon fuels, solvents, and with most acids and chemical solutions.

Lower costs - increased performance

Operating and maintenance costs are drastically reduced. **SIMSITE®** Impellers and Rings are excellent for new or retrofit applications. They are light weight and corrosion, erosion and cavitation resistant! Wear of pump parts is greatly reduced because of **SIMSITE®**'s balance, light weight and self-lubricating properties. This means far less replacement of parts, less downtime, and years of trouble free performance.



Both Impellers operated for 18 months in seawater service. However, the **SIMSITE®** Impeller is untouched by corrosion!

Customized for maximum performance

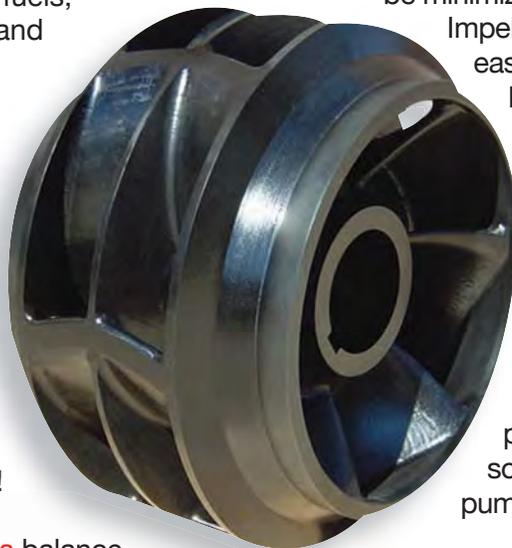
Because **SIMSITE®** Impellers are computer designed and precision machined, the impeller vanes can be designed to maximize efficiency. Problems such as recirculation and cavitation can

be minimized or eliminated with **SIMSITE®**

Impellers. Impeller vane shapes can easily be modified to provide the best vane shape for specific applications.

For more than 98 years, the SIMS Pump Valve Company has been a leader in pump technology. From the invention of the original SIMS Pump Valve to the development of the **SIMSITE®** totally non-metallic composite pump, SIMS has offered innovative solutions for marine and industrial pump applications.

Since it began in 1919, SIMS has focused on complete customer satisfaction with every product manufactured. A unique unconditional customer guarantee is made possible by the highest standards of engineering, manufacture, and customer service.



SIMS – the Proven Name in Pump Technology

Outstanding characteristics give more of what you need

SIMSITE® Impellers are 100% precision machined inside and out, which insures perfect symmetry in the location and shape of the vanes. A smooth interior surface increases the efficiency of the pump by reducing flow resistance. You can be sure that **SIMSITE®** Impellers maintain hydraulic and mechanical balance for the life of the impeller. **SIMSITE®** Impellers are not subject to the compromises and losses in performance found in metallic impellers.

◆ CORROSION RESISTANT

One of the most important advantages **SIMSITE®** has over metal is its resistance to corrosion and erosion in seawater, wastewater, sewage, and chlorinated water. **SIMSITE®** Impellers & Rings are also excellent with most chemical applications and are not subject to damage by gasoline, oil, or refinery by-products.

◆ ELIMINATES ELECTROLYSIS

SIMSITE® is an inert composite which does not conduct electrolysis. Prolonged exposure to salt water will not affect **SIMSITE®** Products. When **SIMSITE®** Impellers & Casing Rings are installed inside a metallic casing; the life of the metallic casing is increased because the **SIMSITE®** Impellers & Casing Rings will NOT support Electrolysis!

◆ COMPUTERIZED HIGH EFFICIENCY DESIGN

All **SIMSITE®** Impellers and Parts are precision machined which increases accuracy and efficiency. Impeller vane shapes are contoured for maximum performance and efficiency and are designed to make the Customer's Operating Point the Best Efficiency Point.

◆ EXCEPTIONAL MECHANICAL STRENGTH

The extraordinary high strength-to-weight ratio of **SIMSITE®** Impellers enables them to replace



metallic impellers which are not only heavy, but are subject to corrosion, erosion, electrolysis and cavitation.

◆ TIGHTER SEALS

SIMSITE® Casing Rings and Wear Rings will not gall or seize like metal rings. Therefore, **SIMSITE®** Rings can operate with tighter clearances permitting less leakage through the rings and increasing pump efficiency. Additionally, **SIMSITE®** Casing Rings and Wear Rings seal against the pump casing. This prevents the “wash out” of the casing ring areas that is a common maintenance problem with centrifugal pumps.

◆ LIGHT WEIGHT

The exceptionally high strength-to-weight ratio of **SIMSITE®** permits a much lighter weight impeller. (approximately 1/6 the weight of bronze or stainless steel.) This means a substantial reduction in start-up load, longer bearing and mechanical seal life, and less shaft deflection.

Improve efficiency,
performance, and longevity
with **SIMSITE®** Impellers..

SIMSITE[®] Impellers Produce Significant Energy and Lifecycle Savings

Reduces Noise & Vibration

Because of the high efficiency design of the **SIMSITE[®]** Impeller, its light weight, its noise absorbing characteristics, and its precision machined design, noise and vibration are reduced in the pump.

SIMSITE[®] Composite Impellers & Rings offer opportunities for improving energy efficiency, performance, and lifecycle of any centrifugal pump, because of their unique design, perfect balance, light weight, corrosion, erosion, and cavitation resistance.

Up to 15 percent or more of a pump's energy consumption can be saved with the use of **SIMSITE[®]** Structural Composite Impellers, especially where the pump is required to work in a corrosive or erosive medium such as seawater, wastewater, sewage, or chlorinated water. For example, over \$200,000 in energy and maintenance expenses can be saved over a five year period for a 45kW (60 hp) vertical in-line pump working in salt water, using a **SIMSITE[®]** composite impeller as opposed to a metallic impeller.

SIMS Pump upgrades existing pumps with **SIMSITE[®]** Impellers & Rings that result in an increase in the Operating Time of ANY pump. **SIMSITE[®]** Structural Composite Impellers & Casing Rings operate more successfully and efficiently than metallic parts.



SIMSITE[®] Impellers are completely machined from solid blocks of **SIMSITE[®]** Structural Composite on 5 to 8 axis machining centers, which enables them to have perfect balance and to be energy efficient!

SIMSITE[®] Impellers are only 15 percent of the weight of traditional metallic materials. The lower weight not only reduces startup load, but also reduces shaft deflection. This allows the rotating element to run with tighter clearances between the rings and the impeller which results in increases in efficiency and the reduction of energy consumption and maintenance costs.



A machined **SIMSITE[®]** Composite Impeller can be engineered to meet any required service in the field.

SIMSITE[®] Impellers Are Excellent for a Variety of Applications...



Just a few of the Industries served by SIMS...

- Merchant Marine
- Work Boats
- Cruise
- Merchant Vessels
- Sewage
- Construction
- Power Generation
- Pulp and Paper
- Utility
- Scrubber Service
- Navy
- Water Towers
- Seaquariums
- Aquariums
- Chemical
- Mining
- Pollution
- Water Parks
- Water Treatment
- Petrochemical

Key Reasons to Choose **SIMSITE**[®] Impellers and Casing Rings

SIMSITE[®] products DO NOT corrode in Seawater and many other fluids; therefore, the efficiency of the **SIMSITE**[®] Impeller & Casing Rings will not deteriorate over time.

When the metallic pump parts begin to wear from corrosion, efficiency drops drastically. This drop in efficiency not only has a significant impact on energy consumption but also increases the cost of maintenance. The life of the pump can be reduced to months instead of years as originally intended.

New technology - **SIMSITE[®] Structural Composite Pumps, Impellers, and Rings NEVER CORRODE in seawater, wastewater, sewage, or chlorinated water.**

SIMSITE[®] *Impellers are designed with state of the art CFD Techniques to maximize efficiency and they are engineered to operate at the Best Efficiency Point (BEP).*

Because **SIMSITE**[®] Impellers are 100% machined on the inside as well as the outside, the

SIMSITE[®] Structural Composite Impellers are optimized using CFD engineering techniques for maximizing the performance and efficiency in which the pump is operating in the field.

It is an all too common problem – You purchased a pump for one specific performance, yet when you put the pump into service in your plant or ship, the pump operates at another point entirely different from the original design point of the pump because of your system requirements. In addition to being



very costly and inefficient, when you operate the pump away from the original design point or best efficiency point (BEP), it causes a multitude of problems. These problems include excessive noise and vibration of the pump, shaft oscillation, cavitation, and premature wear and failure of the mechanical seals, bearings, rings, sleeves, and impellers. In extreme cases, the pump shaft will break right behind the impeller from the excessive radial forces that occur when you operate a pump away from the original design point.



SIMSITE® Casing Rings and Wear Rings

Quality manufactured for longer life

SIMSITE® Casing Rings and Wear Rings are sized to fit the pump housing. They are manufactured to tight tolerances and machined to the dimensions specified. Like all SIMS products, they are quality control inspected before leaving the plant. Rings machined from **SIMSITE®** are structural and rugged enough to withstand a great deal of use and abuse.

All of our Casing Rings and Wear Rings are:

- Corrosion Resistant
 - Lightweight
 - Prevent Electrolysis
 - Prevent Damage to the Casing
 - Non-Sparking
 - Non-Galling
 - Allow Less Leakage
 - Allow for Higher Efficiencies
 - Prevent Catastrophic Failure
- *Outlast Metallic Rings*

How they work

SIMSITE® Rings are designed to seal tightly into the pump casing.

SIMSITE® Casing Rings will seal against the pump casing like a gasket and prevent pump “wash out” or damage to the casing from flow circulating behind the ring.

When the composite becomes immersed in the fluid being pumped it swells slightly, forming an excellent seal against

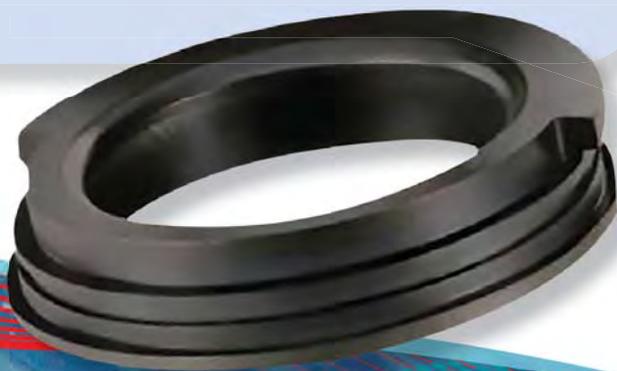
the metal casing. This prevents corrosion and erosion of the pump casing. Another important benefit is that tighter clearances are maintained with **SIMSITE®** Rings which reduces leakage and achieves greater pump efficiency.

Availability

SIMSITE® Casing Rings and Wear Rings are readily available from stock or can be custom manufactured to your specifications. Clearances are set at the factory. Whenever possible, impellers and casing rings are sold as a set for better performance and longevity. Requests for unusual sizes are filled quickly from an ample supply of material stock and computer-aided manufacture.

Durability

SIMSITE® Rings have the same durability as **SIMSITE®** Impellers; they have the same resistance to corrosion and erosion. The rings are self-lubricating and have a lower coefficient of friction which prevents galling and seizing. These features guarantee extended life and lower costs of operation.



◆ **MACHINED FROM SOLID BLOCKS OF SIMSITE®**

SIMSITE® Rings are not cast or molded; rather, they are completely machined from solid blocks of structural composite. The fibers in the engineered **SIMSITE®** Structural Composite are interwoven in a tri-dimensional weave making them superior to other metallic and non-metallic rings and wear rings.



◆ **WILL NOT BREAK DOWN**

SIMSITE® Casing & Wear Rings will not break down under pressure or temperature like thermoplastic rings. They also will not seize and gall like metallic rings.

◆ **SELF-LUBRICATING**

SIMSITE® Rings can take dry starts because of the self-lubricating properties of the graphite embedded in the structural composite.

◆ **TIGHTER CLEARANCES**

SIMSITE® Casing Rings & Wear Rings can operate with close clearances. Because **SIMSITE®** Casing Rings will not seize or gall like metallic rings, they run with tighter clearances. This improves efficiency and reduces shaft deflection and vibration. It also improves running time for the whole rotating element.

◆ **CORROSION RESISTANT**

SIMSITE® Engineered Structural Composite Casing Rings are corrosion resistant and wear much better than metallic rings because of their low coefficient of friction and self-lubricating qualities!

These **SIMSITE®** Engineered Structural Composite Casing Rings, Wear Rings, and Impellers for a Main Circulator in a power plant have self-lubricating qualities and are not subject to corrosion.



Advantage of SIMSITE® Structural Composite Impellers	Cause of Advantage	Most pronounced effect in:
No Corrosion	Impellers machined from SIMSITE® Structural Composite NEVER corrode in salt water, wastewater, chlorinated water, and many chemicals.	Salt Water, Brine, Reverse Osmosis, wastewater and other corrosive applications
No Electrolysis	SIMSITE® Structural Composite Impellers are non-conductive and will NOT support galvanic corrosion.	Salt Water, Brine, and Reverse Osmosis
Less Frictional Losses	SIMSITE® Composite Impellers have machined vane surfaces, which results in much smoother surface finishes. The impellers have a low coefficient of friction with self-lubricating characteristics.	Low Specific Speed Impellers
Less Volumetric Losses	SIMSITE® Composite Impellers run on tighter ring clearances.	Mixed Flow Impellers
Less Mechanical Losses	SIMSITE® Structural Composite Impellers are 6 times lighter than metallic impellers.	All Pumps
Less Vibration	SIMSITE® Composite Impellers are perfectly balanced, both hydraulically and mechanically. They remain balanced throughout the life of the pump.	All Pumps
Less Shaft Deflection	The light weight of the SIMSITE® Structural Composite Impellers reduces start up load and allows for tighter clearances – bearings, seals, rings and sleeves last much longer.	All Pumps
No Efficiency Degradation	SIMSITE® Structural Composite Impellers will not corrode; therefore there is no reduction in efficiency and performance.	Sea Water, Chemicals Applications
Longer Life	SIMSITE® Structural Composite Impellers are corrosion, erosion, and cavitation resistant. They are perfectly balanced and light weight. The average lifecycle is 5 to 7 times longer than metallic impellers in seawater service!	Salt Water, Brine, Reverse Osmosis, Wastewater, and other corrosive applications
Average Expected Pump Efficiency Gain	Depends on existing pump conditions, operating conditions, temperature, and the corrosive nature of the fluid being pumped.	5% - 15%

SIMS Pump Valve Company

Achieve the Ideal Performance

SIMS is ready to supply you with impellers and rings which allow your pumps to achieve ideal performance parameters. Our commitment is to lower maintenance costs and increase pump life.

REPAIRS - Your repair problems will be solved by sending us the complete pump or rotating element for overhaul. SIMS manufactures pumps, pump casings, impellers, rings, shafts, shaft

sleeves, bearings, mechanical Seals and other Pump Components. Your impeller assembly is returned better than when it was originally purchased

SIMS will upgrade your metallic impellers and casing rings with **SIMSITE®** Impellers & Rings, thus increasing operating efficiency & longevity and reducing maintenance costs.

Just Some of Our Other Excellent SIMSITE® Products:

- Complete Composite Pumps
- Guide Bearings
- Sleeves
- Bushings
- Backplates
- Spider Bearings
- Suction Bowls
- Heat Exchanger Doors
- Frame adaptors
- Strainer Boxes
- Powerends
- Husheaters
- Packing Rings
- Mechanical Seals
- Suction Bells
- Wear Plates



WHEN ONLY THE BEST WILL DO!

A tradition of innovation continues...

...you can achieve the ideal!



SIMS

Since 1919

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