



# Unlocking Performance Through Isotropic Superfinishing: The ISF® Surface



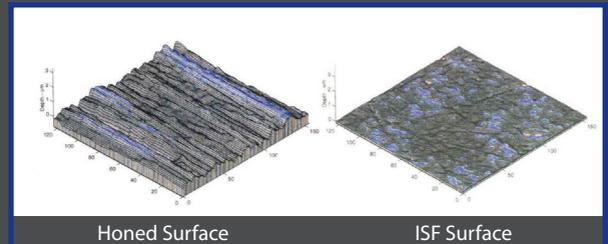
## Why the ISF Surface?

The ISF® Surface is a non-directional low Ra surface achieved via chemically accelerated surface finishing. The ISF Surface has been shown via numerous technical studies to be an optimal surface for gear, bearing, airfoil and many other applications resulting in higher quality components that last longer and perform better than standard finishes. Unlike machined surfaces, the ISF Surface has a unique, non-directional microtexture, without any peak asperities which serve as initiating factors for surface fatigue during operation via the progression of micropitting, wear, surface fatigue and many other problems and failure modes.

## Why REM?

In 1985, REM filed the original patent on chemically accelerated vibratory finishing. This technology revolutionized the surface finishing industry.

To this day, REM continues our dedication to investing in research & development to ensure that our technologies continue to evolve to meet new challenges and to provide solutions to our customers needs. With applications in almost all types of energy transfer mechanisms across a wide range of sizes and complexities, REM and our ISF Technologies firmly remain the benchmark for Isotropic Superfinishing.



## Process Results

- Exceptionally low surface roughness values
- Optimal surface for lubricant retention
- Unique, non-directional, microtexture
- Optimal surface for gear, bearing, and airfoil operation
- Increases load carrying capacity
- Increases loss-of-lubricant component life



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## The ISF Technology

ISF Technology combines the use of nonabrasive media, specialized chemicals, and mechanical energy in the form of random motion to generate an ISF Surface.

The technology relies on a chemical reaction designed to lower the mechanical energy required to refine the surface. The conversion coating actively binds to the surface of the component, enabling metal to be removed more easily and uniformly than by traditional, abrasive processes.

The random motion of the media facilitates the removal of the conversion coating while smoothing and texturing the surface of the component. By repeatedly removing and reforming the coating during processing, the surface of the component can be controllably and accurately refined to the desired surface finish with minimal geometric alteration.

## The ISF Process

- Capable of producing surfaces of 0.05 µm/2 µin or less
- Customized refinement rate for each component
- Vast array of part sizes and quantities can be processed
- Flexibility in automation and control
- The ISF Process typically utilizes vibratory equipment

## The Rapid ISF Process

- Produces ≤ 0.25 µm (10 µin) Ra in 4 minutes
- Ideally Suited for high volume, JIT environment
- Utilizes high energy equipment technology
- Greatly reduced cycle times
- Produces ISF Surface
- Utilizes the same precision and control as the ISF Process



## The Benefits:

- Increase Power Density
- Reduce Wear & Debris
- Eliminate Micropitting
- Increase Resistance to Scuffing
- Reduce Lubricant Operating Temperatures
- Increase Lambda Ratio
- Increase Resistance to Bending Fatigue

## Working with REM

### 1. Initiate an Engineering or R&D Project

- Bring your metal component applications to REM's attention – discuss with a REM Sales Manager.
- Send REM parts for evaluation and processing by REM R&D.
  - May require NDA, part drawings, dialogue with your team's engineering staff.
- REM will retain data to repeat the process as a future paid ISF® Services project (subcontracted processing).

### 2. Utilize REM's ISF® Services

- After initial project, REM will provide an ISF Services quotation.
  - This outsourced processing option is available for use as an immediate and indefinite processing solution or as a bridge to an ISF Technology installation at your facility.

### 3. Install the Solution at Your Facility

- Determine appropriate scale-up need and REM will provide a quotation for an ISF® Installation that includes:
  - Capital Cost and Infrastructure Needs
  - Per Piece Consumable Cost
  - Cycle Time and/or Takt Time
  - Turnkey Installation at your facility.

and/or



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