

## UPGRADE NOTIFICATION

## Stainless Steel Diffuser

### Background

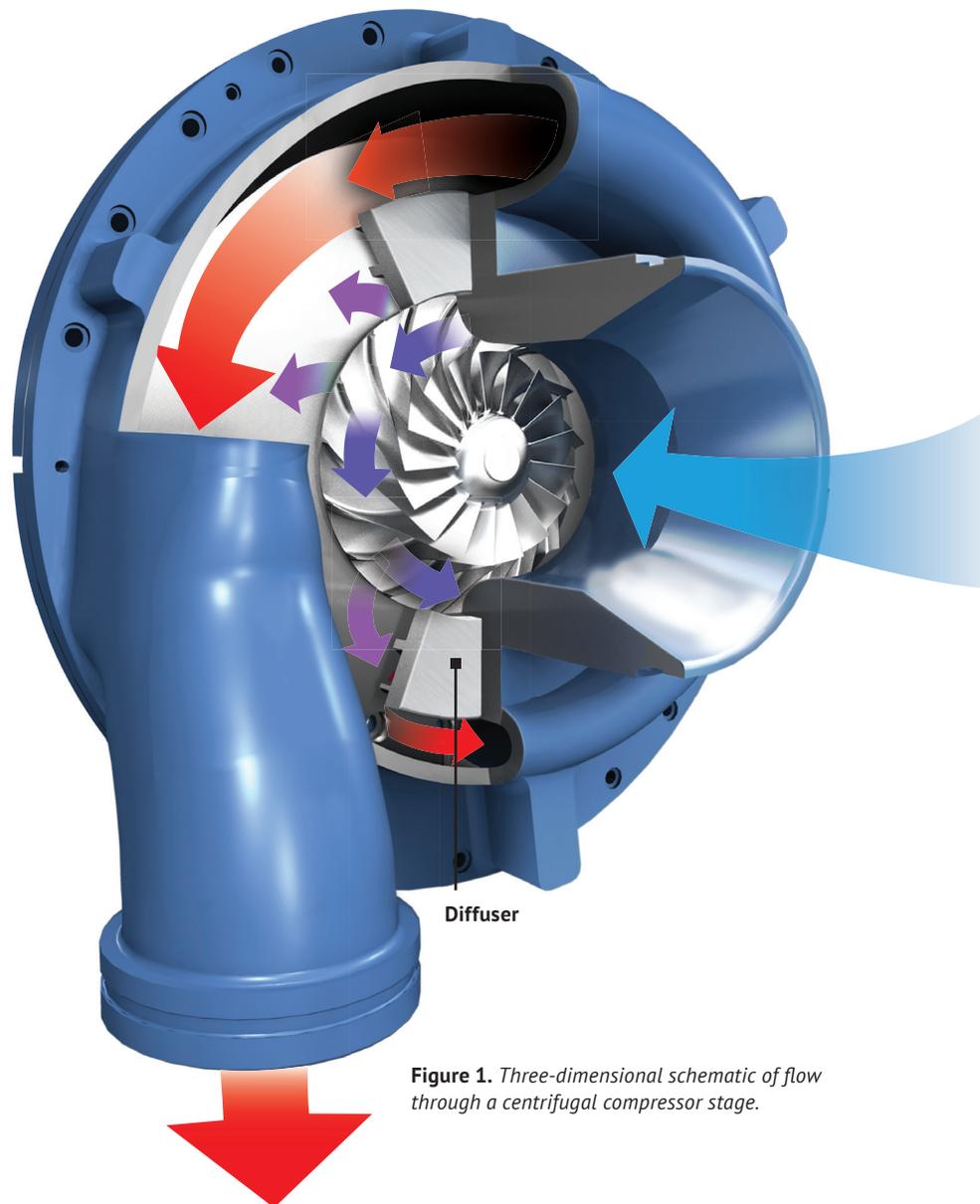
Air handling systems for industrial applications are designed to process large volumetric flow rates. Every installation site, to some degree, has airborne particles and impurities that can have an adverse effect on the life-cycle costs of the system. The cleaner the air and the more resistant the materials of construction are to such contaminants, the longer the period will be between planned maintenance. This will result not only in fewer replacement parts, but also provide higher mechanical and aerodynamic performance.

### Flow Path

Ambient air enters the compressor through the inlet control device where it is then directed and accelerated into the first stage impeller (Figure 1). The rotating impeller transfers energy into the air stream while increasing velocity as the flow moves radially outward through the high efficiency, three-dimensional passages. Once the air travels beyond the outer tip of the impeller, it enters the diffuser section of the compression stage. The diffuser systematically reduces the airflow's velocity and raises the pressure by increasing the sectional area before entering the scroll collection area.

### Inlet Air Filtration

The inlet air filter limits the quantity of potentially damaging foreign contaminants from entering the air compressor. Its performance parameters must be properly monitored, or the filter can become blocked and restrict the flow to the compressor. If the filter is left unattended for extended periods of time, the possibility exists for excessive amounts of contaminants to enter the compressor. In a worst-case scenario, a filter element can fail and release entrapped contents into the air stream. Any of these events could cause premature erosion or corrosive build-ups on the flow path hardware elements leading to mechanical and aerodynamic operational complications.



**Figure 1.** Three-dimensional schematic of flow through a centrifugal compressor stage.

## Stainless Steel Diffuser

The standard aluminum diffuser is the material of choice for the vast majority of air compressor applications. However, for unique sites experiencing high concentrations of airborne particulates and corrosive vapors present in the inlet air stream, a stainless steel diffuser (Figure 2) can offer unique benefits including improved efficiency and extended run times between planned overhauls.

The ASTM 304 stainless steel diffuser material offers a higher hardness and resistance to the erosive action of excessive particulates in the air stream. This material is also capable of resisting the corrosive attack from harmful vapor contaminants including, but not limited to, entrained sulfides and chlorides found in some refinery environments and salt water coastal locations.

FS-Elliott offers stainless steel diffusers as an optional choice for new compressors and as an upgrade package available to existing air compressor installations. As the Original Equipment Manufacturer (OEM), FS-Elliott is in a unique position to have direct access to the authentic manufacturing drawings, material specifications, and assembly clearances. By using genuine OEM parts, the critical diffuser component will include the proper fits and clearances necessary for ensuring the air compressor system performs as intended, the first time and every time.

Please contact your local authorized FS-Elliott distributor or sales representative for a stainless steel diffuser upgrade proposal for your existing air compressor installation.



**Figure 2.** ASTM 304 Stainless Steel diffuser is designed as a drop-in upgrade replacement for existing compressor installations..



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ISO 9001- certified for the design and manufacture of centrifugal compressors.