

# ENERGETICS, NITROCELLULOSE AND EXPLOSIVES PRODUCTION

# WILFLEY®

DURABLE. WATERLESS SEALING. INDUSTRIAL PUMPS.



**Market:**  
**Explosives.**  
**Nitrocellulose**

**Product:**  
**A9 pump.**

**Country:**  
**USA**



## BACKGROUND

The manufacture of energetics, nitrocellulose, military explosives, and industrial explosives has evolved in response to technology, capabilities, and demand. Increase demand in the industrial arena for explosives (demolitions, clearing, mining) has led to expansion of civilian production facilities. Aging military infrastructure has struggled to keep pace with increased military demand and has also spurred several significant upgrade projects.

## CHALLENGE

The manufacture of energetic materials, nitrocellulose, and other explosive materials often includes movement of components and ingredients in liquid or slurry form. As liquids, these materials are not difficult or dangerous to handle. When the liquid evaporates, the residue left behind is often very combustible or explosive. As such, equipment designed to be used in these services need to focus on solutions to this issue.

## THE SOLUTION

Wilfley pumps work well in various explosive duty applications due to several engineering design considerations and modifications to standard products. Beginning with the materials of construction, pumps in these types of services are often specified as low carbon stainless steel construction. Wilfley has standardized on 316L as our standard material for energetic services. To reduce areas where the explosive residue can accumulate, there are several engineering modifications also made to the standard product. First, the pump is supplied with a packed shaft sealing arrangement. This ensures flow from the packing into the process, not allowing residue to accumulate in the sealing portion of the pump. A significant feature of pumps for these types of services include an integrated impeller/shaft sleeve that is machined in one piece out of a piece of 316L billet.



This also guarantees that there is no surface irregularity between the sleeve and the impeller, ensuring that there is no place for the residue to accumulate. All internal surfaces that will be in contact with the pumped material are polished to a surface finish of 40 Ra. Finally, all internal clearances within the pump are widened to a minimum of 1/16". Pump cases are specified to NOT include casing drains. All of these are an effort to minimize the opportunity for residue to accumulate in the pump. The widening of the internal clearances does affect the pump performance, and pumps must be selected taking this de-rating factor into account. Externally, the pumps are supplied with thermowells welded to the back of the pump case to allow for temperature monitoring of the packing/sealing area. The pumps are also specified to run at a speed of 1750 rpm or slower and are direct driven by explosion proof motors. Mounting plates are specified as 316SST channel, and TB Wood DuraFlex couplings have also become standard.

## **THE RESULTS**

As a result of these significant product modifications, there are two main pump suppliers recognized as providers of equipment into these types of services. Experience, capabilities, and agility have firmly established Wilfley as the leading supplier of centrifugal pumps for energetics/nitrocellulose/explosive services, resulting in providing equipment for several significant projects in the recent past.

## **WILFLEY**

Wilfley has now been providing heavy duty centrifugal pumps throughout the world for almost 100 years. The company is still based in Denver, CO and it is currently in its 5th generation of ownership and operation.

We continue to support every single pump that has ever gone through our doors while ambitiously striving forward to pioneer revolutionary pump designs and innovative sealing technologies for today's most difficult pumping applications.



**Tel: +1-303-779-1777**

**Email: [pumps@wilfley.com](mailto:pumps@wilfley.com)**

**[www.wilfley.com](http://www.wilfley.com)**

**5870 E. 56th Avenue Commerce City, CO 80022 USA**

**WILFLEY®**

**DURABLE. WATERLESS SEALING. INDUSTRIAL PUMPS.**