

# ROCLEAN CLP-V SERVICE

## REMOVAL OF BLACK DUST FROM GAS PIPELINES

Black powder or black dust represents a major problem in natural gas pipelines throughout the world. Many different compositions with different properties can occur in dry, greasy or wax like conditions.

Whilst recent research has improved the understanding of its formation and occurrence, black powder continues to create widespread problems in equipment fouling and flow reduction. In the context of the operation of pipelines, black powder can result in problems like: Clogging of instruments, reduction in diameter and increased pressure drop or erosion due to powder flow.

### THE SOLUTION

ROSEN's new technology successfully combines the advantages of regular cleaning tools with those of magnetic inspection tools, as well as incorporating a specifically developed bypass and flushing system.

Central feature of the concept is a bypass flow that runs through the middle of the tool. The accelerated central flow creates a negative pressure inducing a flow through the suction tubes. The evacuated medium flows into the bypass nozzle from where it is transported downstream. Due to a special flow guidance by replacing the evacuated volume, a Vortex flow is created in the brush suction area.

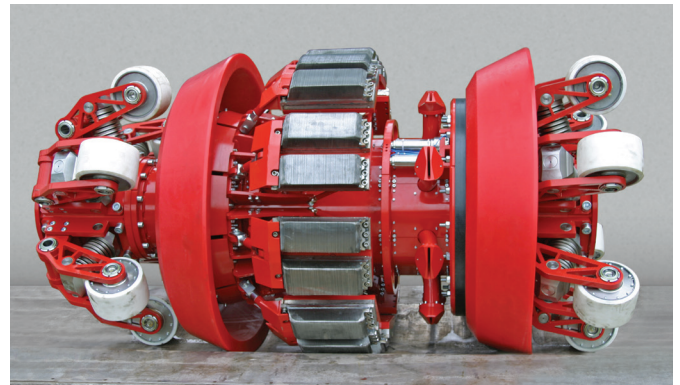
Finally, the combined flow through the tool creates a flushing effect in the downstream area and supports particle transportation.



Amount of black powder after cleaning run

### KEY ADVANTAGES

- Increase of the integrity and life time of the pipeline and installations.
- Effective Cleaning in reduced number of runs.
- Improvement of the transportation performance of the pipeline (reduced differential pressure –reduced costs).
- Optimized filter change intervals.
- Improved quality control of the delivered product.
- Continuous control of pipeline condition.
- High quality service with certified processes (API 1163), personnel qualification (ASNT) and equipment (CE, ATEX).



48" Active Cleaning tool

### SERVICE OPTIONS

- Effective cleaning – Less runs for clean pipeline
- Adapted program – Cleaning for actual condition and goal
- Versatile tool – Tool can be adapted to a wide range of run and pipeline conditions
- Support Wheels – centralization and rotation
- Cups or discs – sealing
- Brushes with magnets – cleaning and differential pressure
- Jet pump principle – suction and dust transportation
- Bypass Vortex flow – cleaning efficiency

## **ROCLEAN CLP-V SERVICE REMOVAL OF BLACK DUST FROM GAS PIPELINES**

### **The principles of active cleaning**

There are clear differences between standard and active cleaning. The more conventional cleaning methods tend to lead to lower efficiency, heavy wear on equipment and more cleaning runs being needed.

The principles of active cleaning (vacuum cleaner, differential pressure, Venturi effect, etc.) lead to the cooperation of the flow and pressure profile, positively impacting the cleaning results. It is combining the effects of high friction cleaning brushes with the directed flushing of the cleaning area ending in an upstream transport of the debris by the entire bypass flow.

### **ROSEN 's unique cleaning tool concept**

Our unique approach is based on the following:

- Support wheels (centralization, rotation)
- Cups or discs (sealing)
- Brushes with magnets (cleaning, braking)
- Jet pump principle (suction, dust transportation)
- Bypass Vortex flow (cleaning efficiency)

ROSEN's new technology successfully combines the advantages of regular cleaning tools with those of magnetic inspection tools, as well as incorporating a specifically developed bypass system. Carried by support wheels which are sloped so as to create continuous rotation for the purpose of preventing one-sided wear of wall-touching or weightbearing components, the tool is sealed with polyurethane guiding and sealing discs or cups. To improve cleaning capability, it is also equipped with spring supported magnetic brushes. And all of these mechanical components can be adapted to any pipeline properties, hence optimizing cleaning efficiency under a wide range of different conditions.

A central feature of the concept is a calculated bypass flow that runs through the middle of the tool. The negative pressure created as a result of the acceleration of the medium permits the use of suction tubes. The evacuated medium flows into the bypass nozzle from where it is transported, together with the central bypass flow, to the downstream area of the tool. The evacuated volume is replaced continuously by a specially designed inlet channel. Due to the special flow guidance of the tool, a Vortex flow is created in the brush suction area. Moreover, the bypass flow through the middle of the tool transports additional powder particles. Finally, the combined flow through the tool creates a flushing effect in the downstream area and supports particle transportation.

Due to the flexible design of the Active Cleaning tool, it can be adapted to a wide range of pipeline conditions.

### **Our vast experience and field tests**

ROSEN has more than 30 years' experience in ILI and cleaning throughout the world. And based on specifically developed technology, we have constructed various different tools and performed numerous cleaning runs with each tool.

The new technology is capable of not only removing remarkable volumes of black powder from a pipeline, but also to be operated in a progressive cleaning program because of its variability. Furthermore, it enables an improved understanding of the interaction between the tool, pipeline and powder accumulation to be ascertained.