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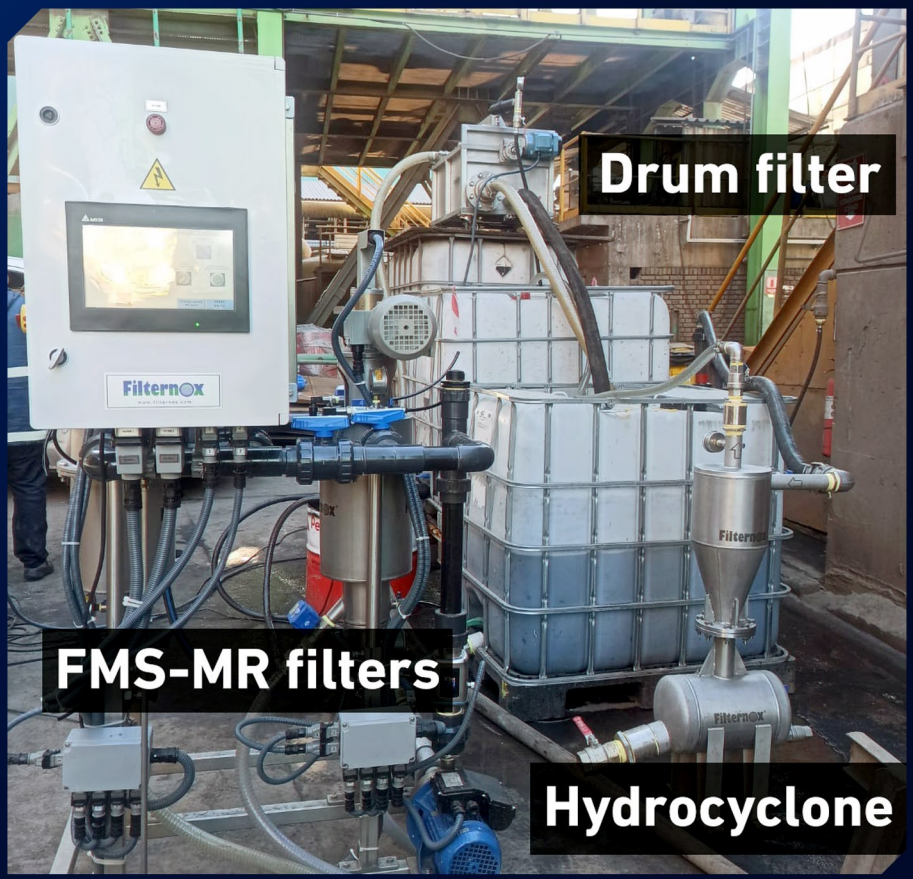
Steel Industry Filtration Test

Open Loop Cooling Water Filtration for Rolling Mill

Filternox®
Automatic Self-Cleaning
FMS-V-MR



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Comprehensive Test Report

Report Date: January 17, 2024
Industry: Steel Industry
Application: Open Loop Cooling Water Filtration for Rolling Mill
Water Source: Rolling Mill Open Loop Water Cooling Tower Basin
Test Flow: 4 - 20 m³/h
Test Dates: December 25-28, 2023 / January 4, 2024

Introduction

The Filternox® Engineering and Testing Team dedicated five days to the **steel industry** to conduct meticulous filtration tests. The focus was on evaluating the efficiency of the Drum Filter and Hydrocyclone at various micron levels and flow rates.

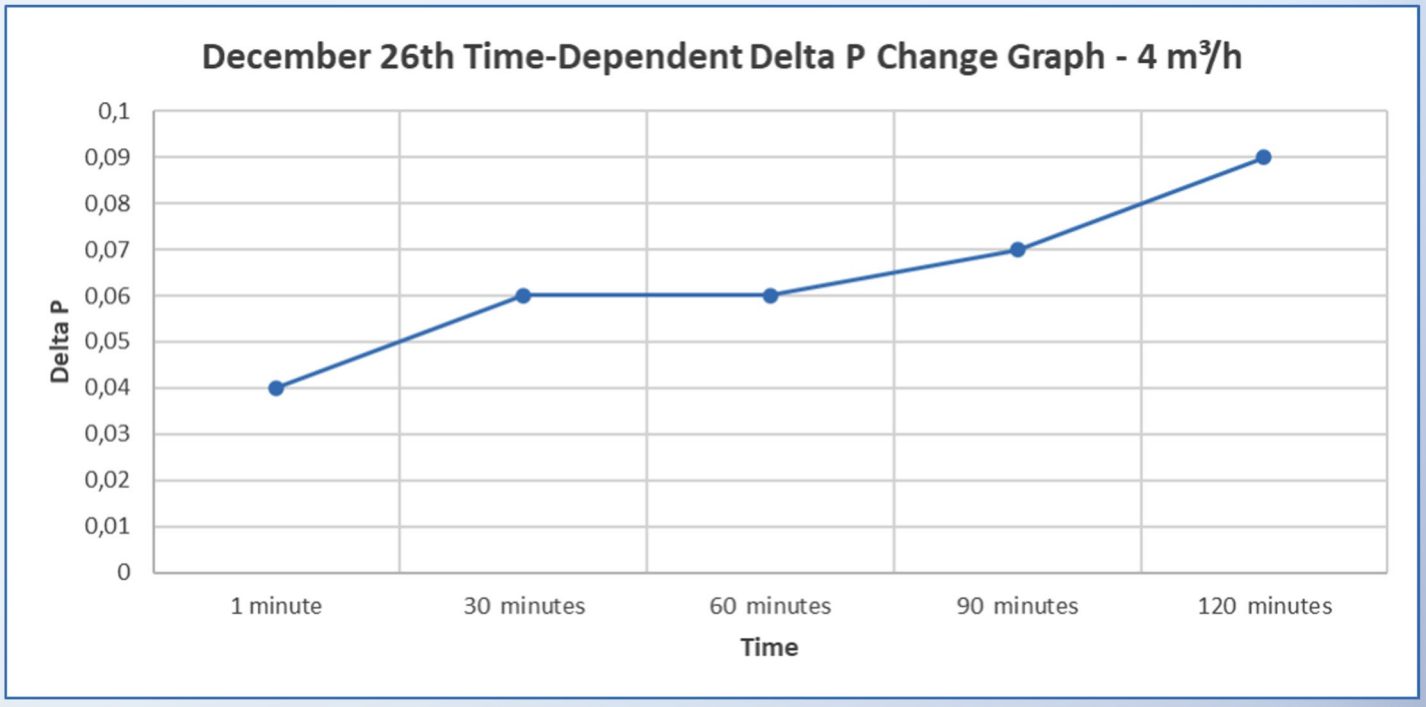
Testing Procedure and Key Results

Different flows (10-15-20 m^3/h) were passed through Filternox® Drum Filter and Filternox® Hydrocyclone.
Efficiency tests included measuring delta P change values of the FMS-V-MR Automatic filter connected in series at the outlets of the hydrocyclone and drum filter.
Hydrocyclone successfully maintained a Delta P below 0.5 bar.
Drum filter showed a Delta P spike within 7 minutes, exceeding the set value.

Test Results Overview

December 26th

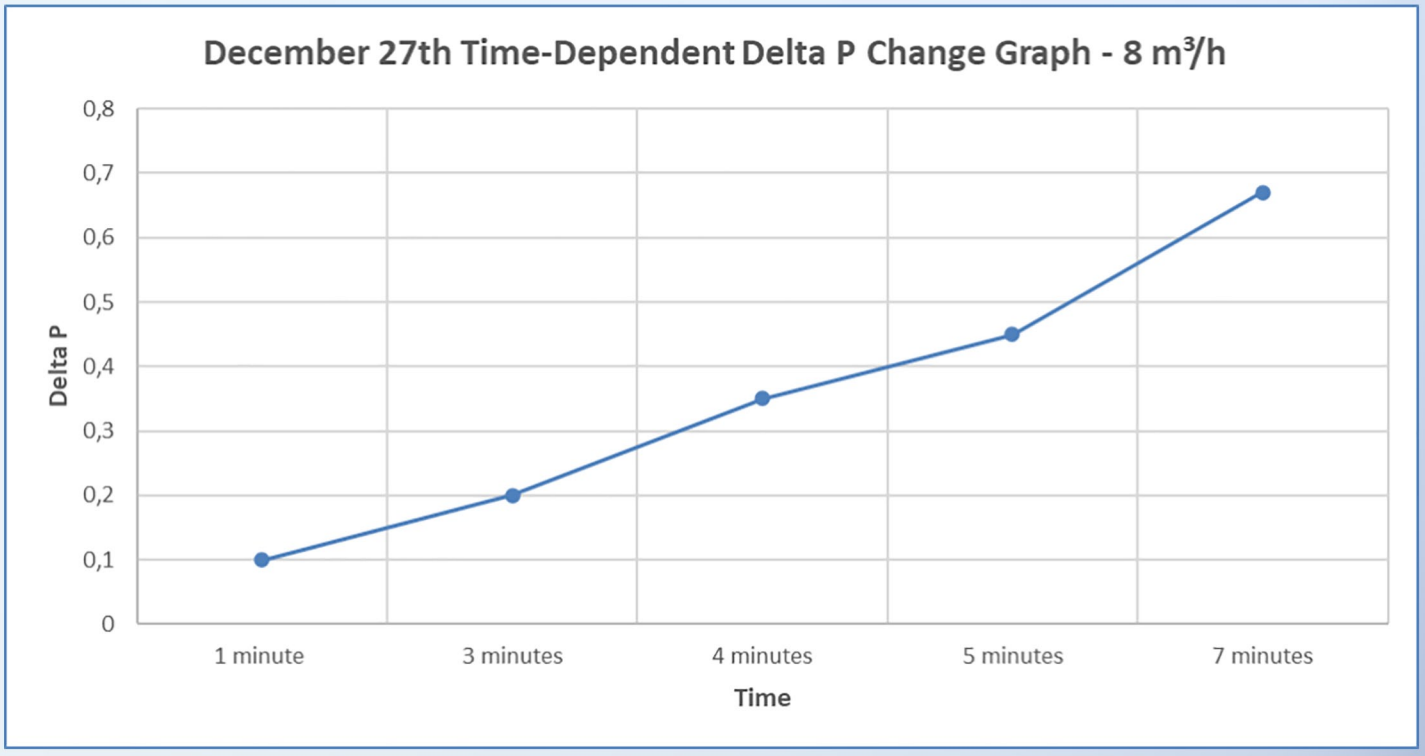
Hydrocyclone and drum filter operated at 8 m^3/h each, totaling 16 m^3/h main flow.
Post-hydrocyclone filtration through two FMS-V-MR filters at 4 m^3/h.
Delta P at 120 minutes: 0.09 bar.



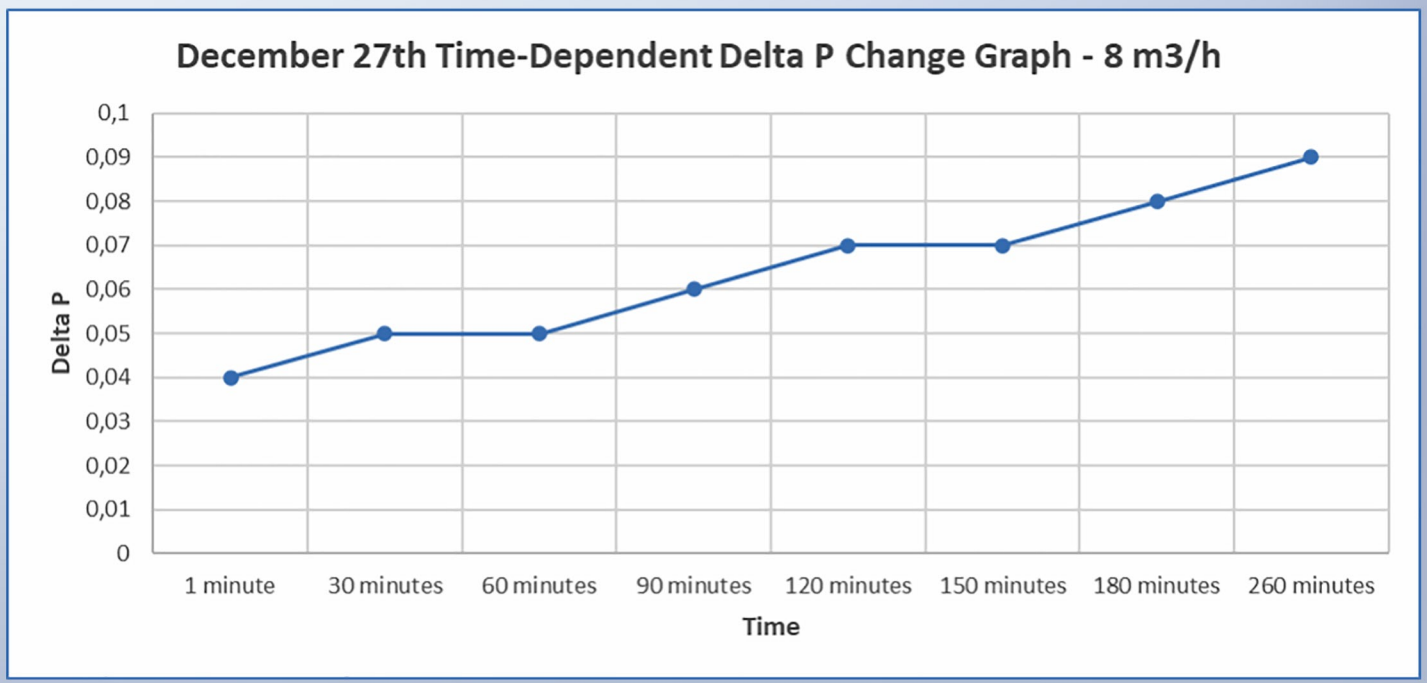
Graphic 1.1. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter Hydrocyclone Outlet - FMS-V-MR Filter Inlet

December 27th

Drum filter connected to FMS-V-MR filter at 8 m^3/h.
Delta P exceeded 0.5 bar at the 7th minute (0.67 bar).
Hydrocyclone connected to FMS-V-MR filter at 8 m^3/h.
Delta P at 260 minutes: 0.09 bar.



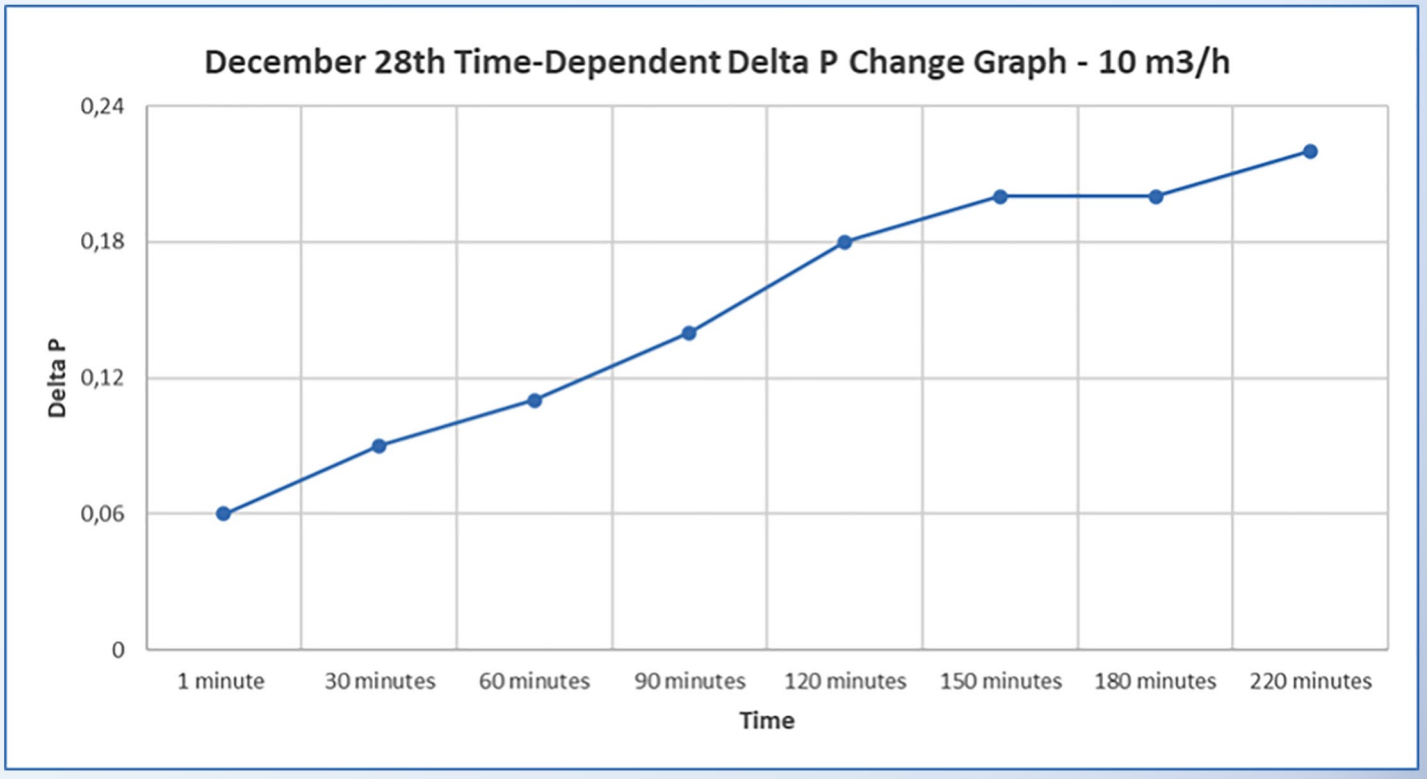
Graphic 1.2. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter - Drum Filter Outlet - FMS-V-MR Filter Inlet



Graphic 1.3. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter - Hydrocyclone Outlet - FMS-V-MR Inlet

December 28th

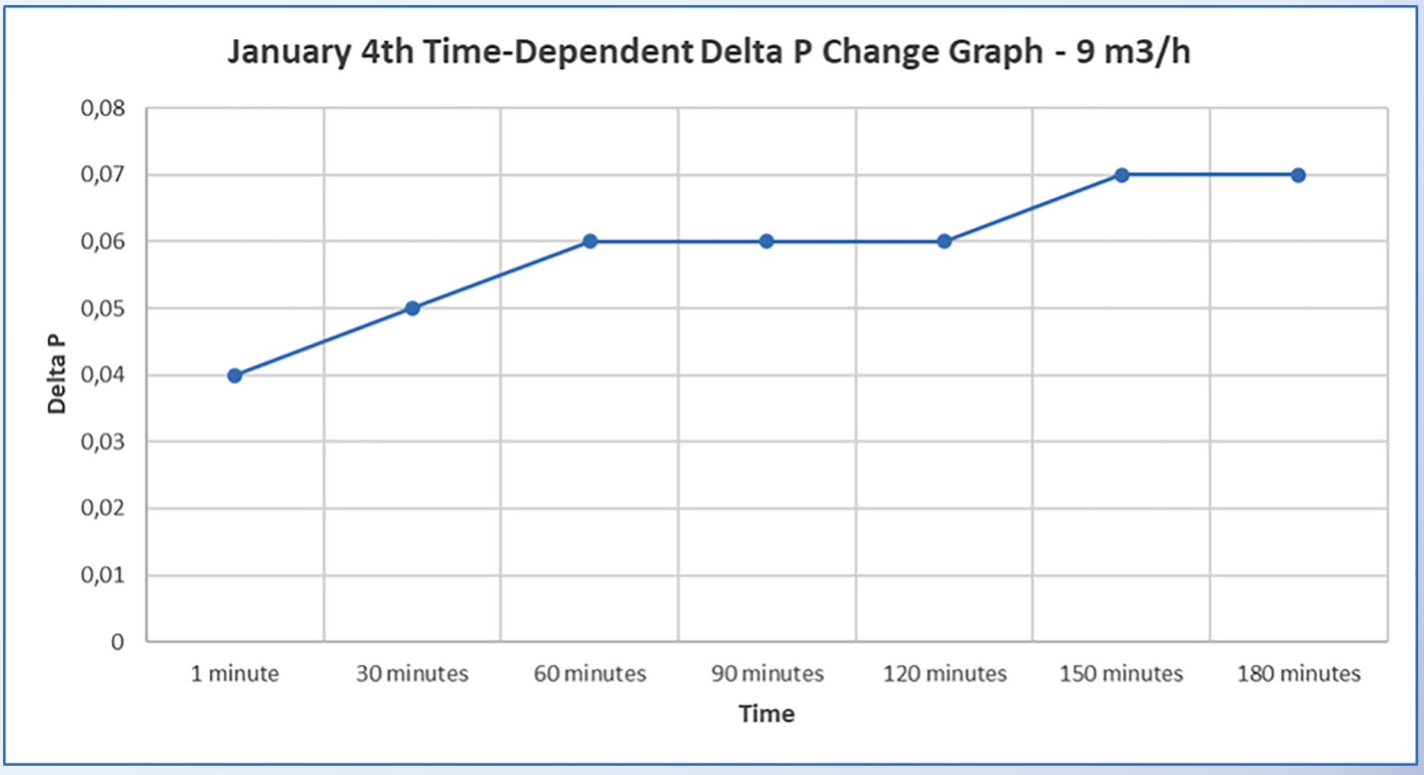
Hydrocyclone connected to FMS-V-MR filter at 10 m^3/h.
Delta P at 220 minutes: 0.22 bar.



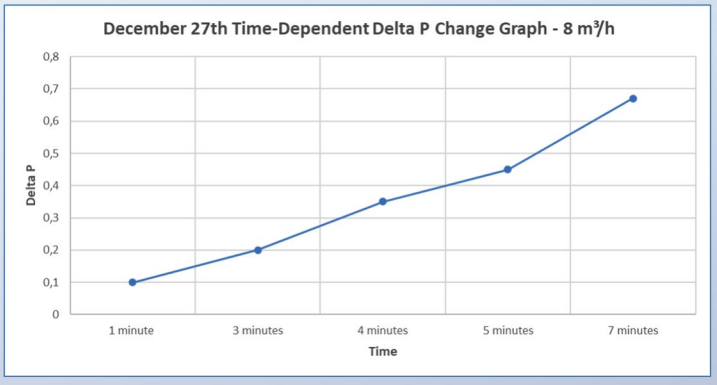
Graphic 1.4. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter - Hydrocyclone Outlet - FMS-V-MR Inlet

January 4th

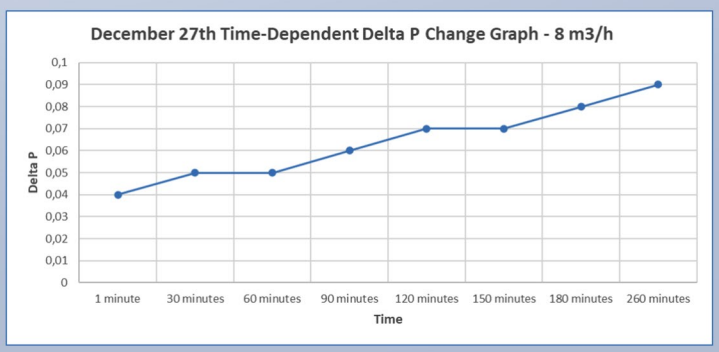
Hydrocyclone connected to FMS-V-MR filter at 15 m^3/h, then increased to 20 m^3/h.
Delta P at 180 minutes: 0.07 bar.



Graphic 1.5. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter - Hydrocyclone Outlet - FMS-V-MR Inlet



Graphic 1.6. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter (Drum Filter Outlet - FMS-V-MR Filter Inlet)Model Filter - Hydrocyclone Outlet - FMS-V-MR Inlet



Graphic 1.7. Time-Dependent Delta P Change Graph for 50-micron FMS-V-MR Model Filter (Hydrocyclone Outlet - FMS-V-MR Filter Inlet)

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Benefits and Recommendations

Implementing Filternox® Hydrocyclone + Filternox® FMS-V-MR Model Filter is suggested for benefits such as reduced backwashing frequency, cost-effectiveness, and enhanced performance compared to alternatives.

Benefits of Hydrocyclone Seperation + Filtration with Filternox® FMS-V-MR

+ Prevents frequent backwashing,
+ Reduces water discharge from filter's drain,
+ Cost-effective and space-efficient,
+ Higher performance compared to alternatives,
+ Improves manufacturing and product quality,
+ Protects against particulates, extending tower fill lifespan,
+ Decreases water consumption.

In the tests conducted with Filternox® Hydrocyclone and drum filter, the drum filter before the FMS-V-MR model automatic backwashing filter failed to demonstrate the expected performance. However, the tests carried out with Filternox® Hydrocyclone Separator + Filternox® FMS-V-MR model filter have proven that the combination of these two systems provide acceptable results.

Sincerely,

Filternox Europe, S.L.