

How a European color masterbatch producer has reduced machine downtime by 83% with Clean Xpress® !



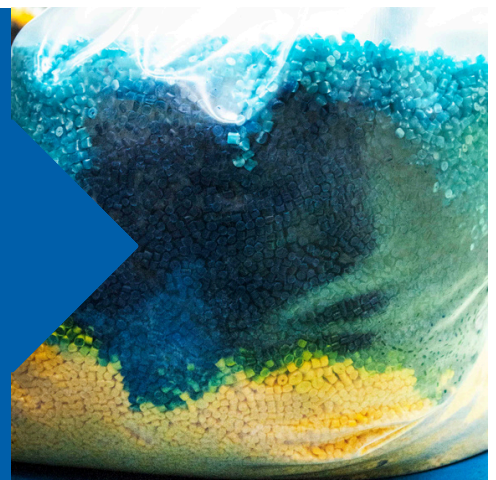
THE CHALLENGE

An European company specialized in the production of colored polyolefin masterbatches (HDPE, LDPE, PP) dedicated to various markets (extrusion, injection, blow molding) uses a wide range of pigments and colorants – white, black, blue, yellow, red, green, etc. They produce these products on two screen screw extrusion lines.

The challenge is to minimize the machine downtime to clean the barrels and the screws, due to colored contaminants. And therefore to restore productivity with a faster high-quality cleaning process !

The problem before using Clean Xpress®

-  **High machine downtime**
-  **Color contamination**



COLOR & MATERIAL CONTAMINATION

This issue is the main origin of the problem. Colored pigments tend to remain present in the extruder, being **stuck into dead zones** of the barrel or the screw.

This phenomenon results in **rejection of colored contaminant** on the next production or carbonization of the pigment, causing ultimately a **rejection of black speck**.

In addition and depending on the wearing of the machine or the material itself, there can be **generation of unmelted resin, gels or carbonized material** that would cause as well black speck generation.

- **Impact on product quality**
- **Generation of defaults**
- **Non conformity of finished product.**

REDUCING MACHINE DOWNTIME

The producer was using virgin resin to rinse the extruders. Here, it was a **standard LDPE (MFI 2 at 190°C/2, 16 kg) processed at 180°C**.

• The rinsing technic is usually followed by ➤ two different steps - depending on the level of contamination:

- For a low level of contamination, they continue to rinse material until there is **no more visible contaminant appearing on the resin strains (2-3 hours)**.
- For a high level of contamination, a **machine stop and a dismantling of the screws** is done with manual cleaning operation (4-5 hours)
- In average, we can consider **3h of cleaning time with a waste of 200 to 300 kgs** of virgin resin to rinse the extrusions lines.


➤ **Impact on Production Cost and Productivity.**
 ➤ **If rinsing only - low level of cleaning method presenting over time, a risk of quality.**

In total, considering an average price of 1,500 €/T for LDPE (Platts index February 2025), two production lines with two color changes per week, and the company operating 24/7 for 50 weeks, the company loses:

➤ **50 T** of LDPE used to rinse – equivalent to **two full truckloads / year** resulting in **70K€** in material loss.

➤ **600 hours spent** on line cleaning instead of producing – equivalent to **12.5 days of cleaning per year per line.**

SOLUTION PROVIDED

After a technical discussion with Polytechs,  **Clean LDPE** was recommended.

Clean LDPE is a purging compound containing high level of additives (non-abrasive minerals and organic additives) and Low Density Polyethylene (LDPE) as carrier.

Clean LDPE is especially useful in extrusion applications: Films, sheets, cables, pipes, compounding.

Clean LDPE hybrid recipe reduces the cleaning time of the screw and the barrel of the extruder.

Operating temperature of

110°C  TO 200°C







MFI (190°C / 2.16 kg)

1.5 - 2.0

RESINS

 LDPE & LLDPE
  BIO RESINS
  FLEXIBLE PVC
  XLPE / PEX

APPLICATIONS

 PIPES, TUBES & PROFILES
  INJECTION MOLDING
  BLOWN & CAST FILMS
 COMPOUNDING
  FOAMED SHEETS
  WIRES & CABLES

The **Clean LDPE** was used according to the following guideline:

- Ending extrusion cycle of blue masterbatch production + starting the filling of the hopper & extruder with **Clean LDPE**
- Extrusion for **2 minutes + T°C down to 110° C**
- Screw stop **for 10 min** (RPM = 0)
- Restart in disco purge mode (RPM variations)
- Emptying of the hopper & extruder of **Clean LDPE**, then start of the **new yellow production**.

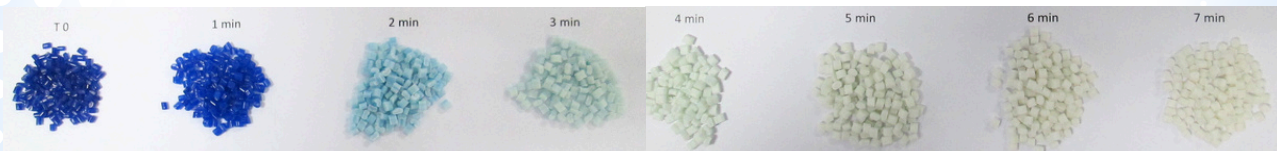
RESULTS & ROI

Lab line results

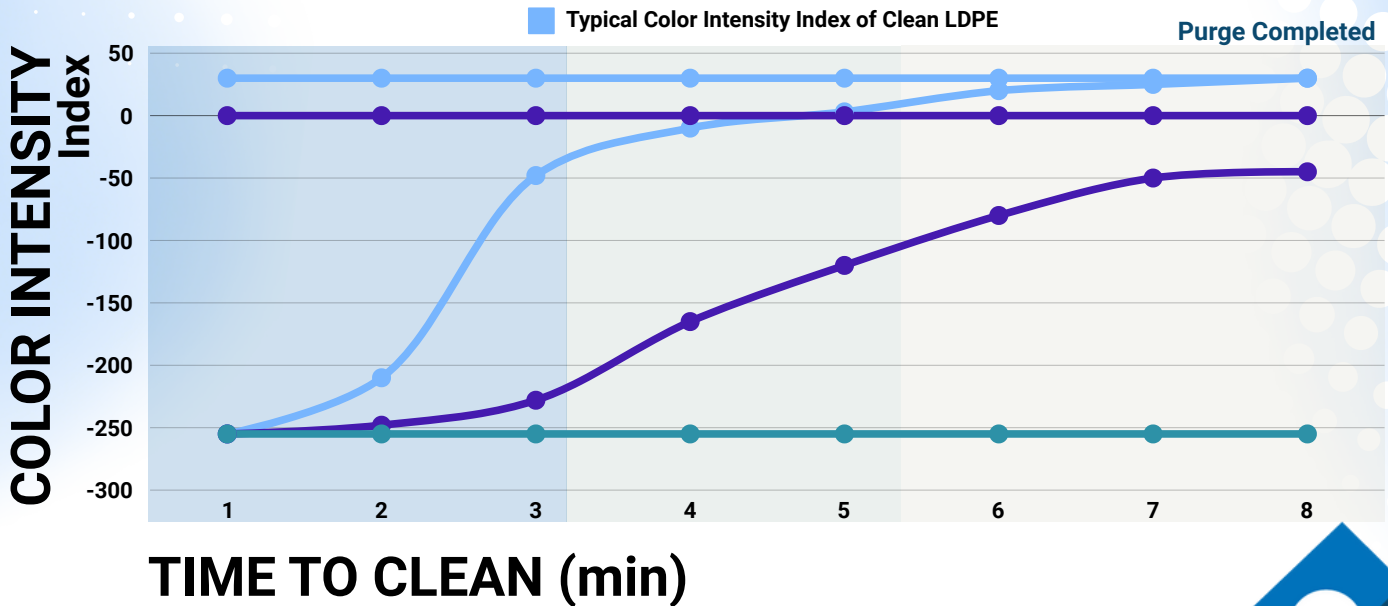
To replicate the gain observed – the customer tested the solution on a single screw lab line with the same application. Here are the results observed :

Tested solutions	Test conditions	Test results
Virgin LDPE MFI 2	LDPE resin + 2% Blue pigments	Picture of pellet samples at T+n
CLEAN LDPE	Single Screw (45 mm – 23 L /D)	Color intensity (ASTM D1925)
	Processing T° = 185°C	State of the screw before / after CleanX purge
	Introduction of CLEAN LDPE & virgin LDPE = T0	

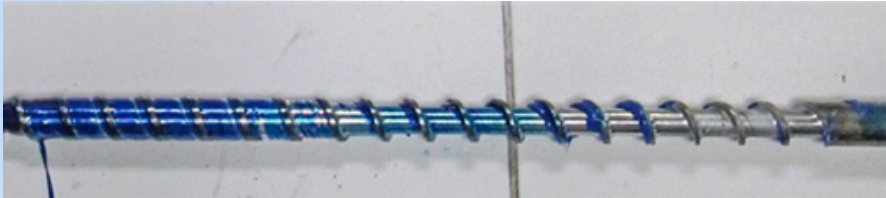
🕒 Clean LDPE is nearly 2 times faster than virgin LDPE resin



■ Purge with Clean LDPE after blue MB production
 ■ Purge with virgin LDPE after blue MB production
■ Typical Color Intensity Index of blue MB production
 ■ Typical Color Intensity Index of virgin LDPE



Screw visual comparison with/without Clean LDPE



➤ Single screw after production of LDPE+2% blue additive + rinsing step with virging LDPE (after t=7min)

Single screw after production of LDPE+2% blue additive + purging step with Clean LDPE (after t=7min) ⬅



☑ Real gains obtained on their INDUSTRIAL LINE for one cleaning process.

	Virgin LDPE	Clean LDPE	Gain
Time spent	180 min	30 min	150 min/ 2h30 (6X Faster)
Quantity used	250 kgs	50 kg	200 kg (5X less Material)
Economic gain	37% of savings		

CONCLUSION - ROI

540H saved on two lines and available for production

83% of machine downtime reduction

2x less material / month to purge

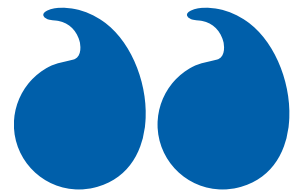
Customer Testimonial



The value is huge - In total, it is the equivalent of 22 more days of production time that we gained.

What we truly appreciated was the support of Polytechs to technically discuss with us our cleaning issues with the right wording.

What is enjoyable is the ability of the Clean LDPE to clean without issue the Barrel & to be easily removed from the screw and extrusion machine elements thanks to its "elastic behavior".



Request a Sample



Order your free Clean Xpress® sample now and boost your efficiency today or [discuss your project with our experts!](#)