VOELPKER | plastic series

TECHNICAL STUDY

Efficient screw cleaning

Less material consumption

Cost savings

Reduced cleaning time

CLEANING CONCENTRATE CEVO®-CLEAN 1823

Fast colour change after processing dark blue PMMA

Introduction

CEVO®-clean 1823 is a highly efficient cleaning concentrate, which enables particularly thorough and user-friendly cleaning of extruders, injection moulding machines and blow moulding machines, including hot runner systems.

The particular effectiveness of CEVO®-clean 1823 is based on a combined chemical-physical active principle on the basis of optimally harmonised solid solvents and non-abrasive minerals. The cleaning concentrate is always diluted with the polymer that is the basis for the subsequent material. CEVO®-clean 1823 can be used in combination with almost all common polymers. This makes cleaning particularly cost-effective.

The present study showed that CEVO®-clean 1823 is also particularly good for the effective cleaning from intensively coloured materials. The tests were carried out with transparent PMMA, coloured with 4% of a dark blue masterbatch. The aim was to clean the injection moulding machine from intensely blue coloured PMMA to colourless, optically perfect transparent PMMA in a short time.

Materials and test conditions

Testmaterial
Plexiglas 7N, Röhm GmbH
Colour Batch Blue Tekolen 15-06213 (Grafe)
CEVO®-clean 1823

Testequipment and Testbedingungen
Injection molding machine: DEMAG Ergotech 100/420-310s, Clamping force 1000 kN, Screw diameter 35 mm
Molded part: plate 100 x 100 x 2 mm^3 matt, Number of cavities: 2
Shot weight: 64 g, Cycle time 40 s
Temperature profile: Nozzle: 255 °C – Zone 4: 255 °C Zone 3: 255 °C - Zone 2: 240 °C - Zone : 230 °C – Feed: 70 °C

Test principle:

The colour change was prepared in the same way for the 3 different experiments: At the beginning of the test, PMMA mixed with 4 % colour masterbatch (dry mix) was filled into the injection moulding machine and then 20 of the dark blue coloured sheets were produced (Fig. 1).

The injection molding machine was then pre-cleaned from the coloured compound with the partial quantity of cleaning agent specified in Table 1. During this pre-rinsing, the corresponding amount was discharged as a 'cake'. Subsequently for a better assessment of the final colourlessness, plates were produced until colourlessness.

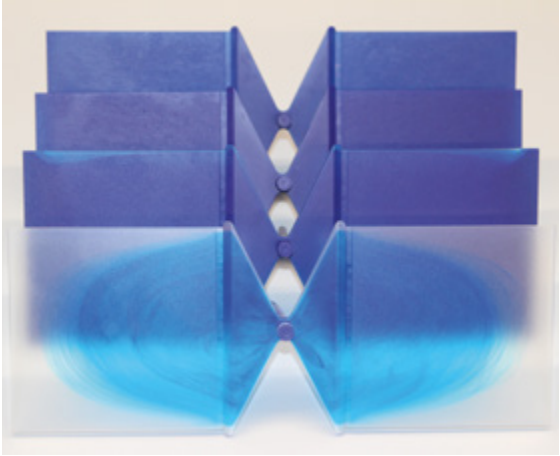


Fig. 1 Test start: Sheet injection molding (PMMA 4% Color MB). The injection molding machine is completely filled with blue PMMA.

Results

Tab. 1: The effectiveness of CEVO®-clean was compared in the test with pure PMMA (1.) and a commercially available competitor product (2.), which is used undiluted.

CEVO®-clean was diluted in a ratio of 1:4 with the pure PMMA diluted (3.)

Cleaning agent	Concentration of cleaning agent [%]	Pre-rinse (output as „cake") [kg]	Molded plates (64 g each) until colorless	PMMA [kg]	Cleaning agent [kg]	Time [min]
1. PMMA	No cleaning agent used	0,8	21	2,14	No cleaning agent used	21
2. Market competitor	100	1,5	>60	>3,8[2)]	>1,5	>55[1)]
3. CEVO® 1823 in PMMA (1:4)	**20**	**0,8**	**9**	**1,2**	**0,16**	**11**

Table 1: Faster color change and reduced material usage with CEVO®-clean 1823. In contrast to CEVO®-clean 1823, the competitor's product requires an additional contact time of 10 minutes. Even after rinsing with the specified amount of PMMA, streaks of the cleaning agent remained on the plates. The test was subsequently discontinued. The competitor's product proved to be ineffective for the test setup.

Fig. 2 Competitor: Streaks of the cleaning agent on the plates – even after rinsing with PMMA.

Fig. 3 Fast color change by using CEVO®-clean 1823/PMMA (1:4). See also Tab. 1.

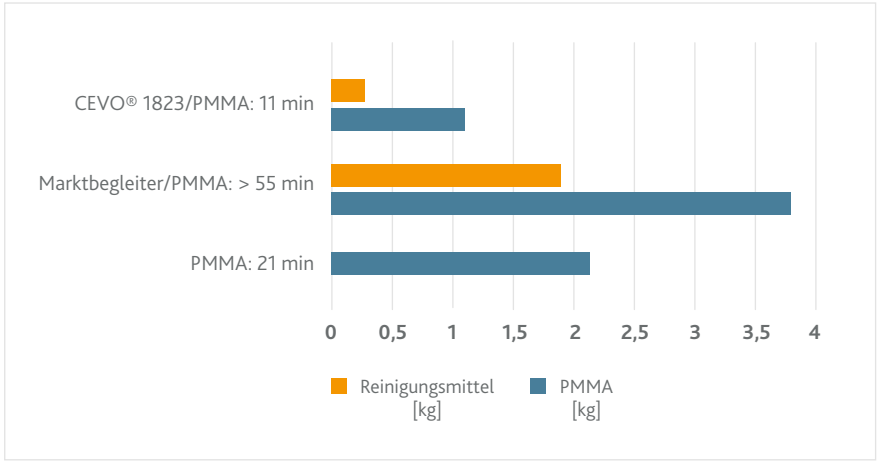


Fig. 4 Comparison of cleaning methods: Time and material demand.

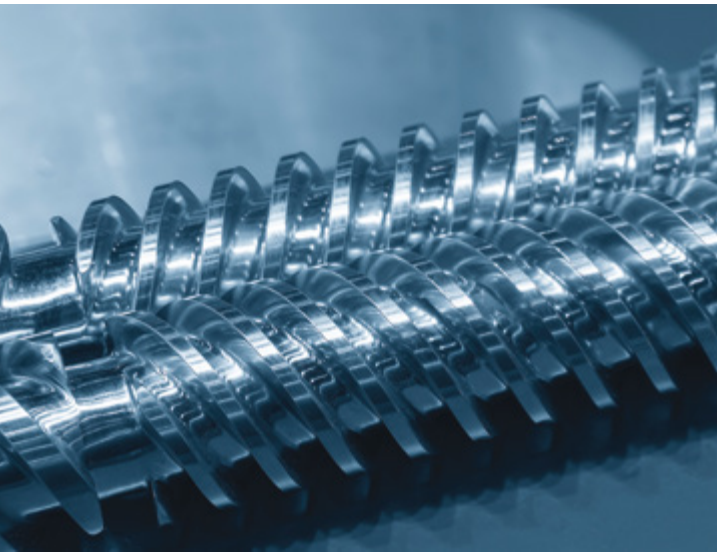
Conclusion

CEVO®-clean 1823 is a versatile 'one 4 all' concentrate for almost all common thermoplastics and is always diluted with a polymer that is also the base for the subsequent material. This means that only one cleaning concentrate is required for almost all common polymers.

CEVO®-clean J-1823 enables a quick material and colour change, shorter downtimes and lower scrap costs. CEVO®-clean 1823 is therefore very cost-effective.

CEVO® 1823: The advantages at a glance:

- 'One 4 all' - Easy mixing: one cleaning granulate for all polymers
- Cost-effective concentrate: dilution (dry mixing) with application polymer 1:4
- Faster colour change
- Gentle cleaning and removal of even stubborn deposits
- Highly effective combined chemical and physical principle of action
- Processing temperature range up to 360 °C
- Can also be used in hot runner systems



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