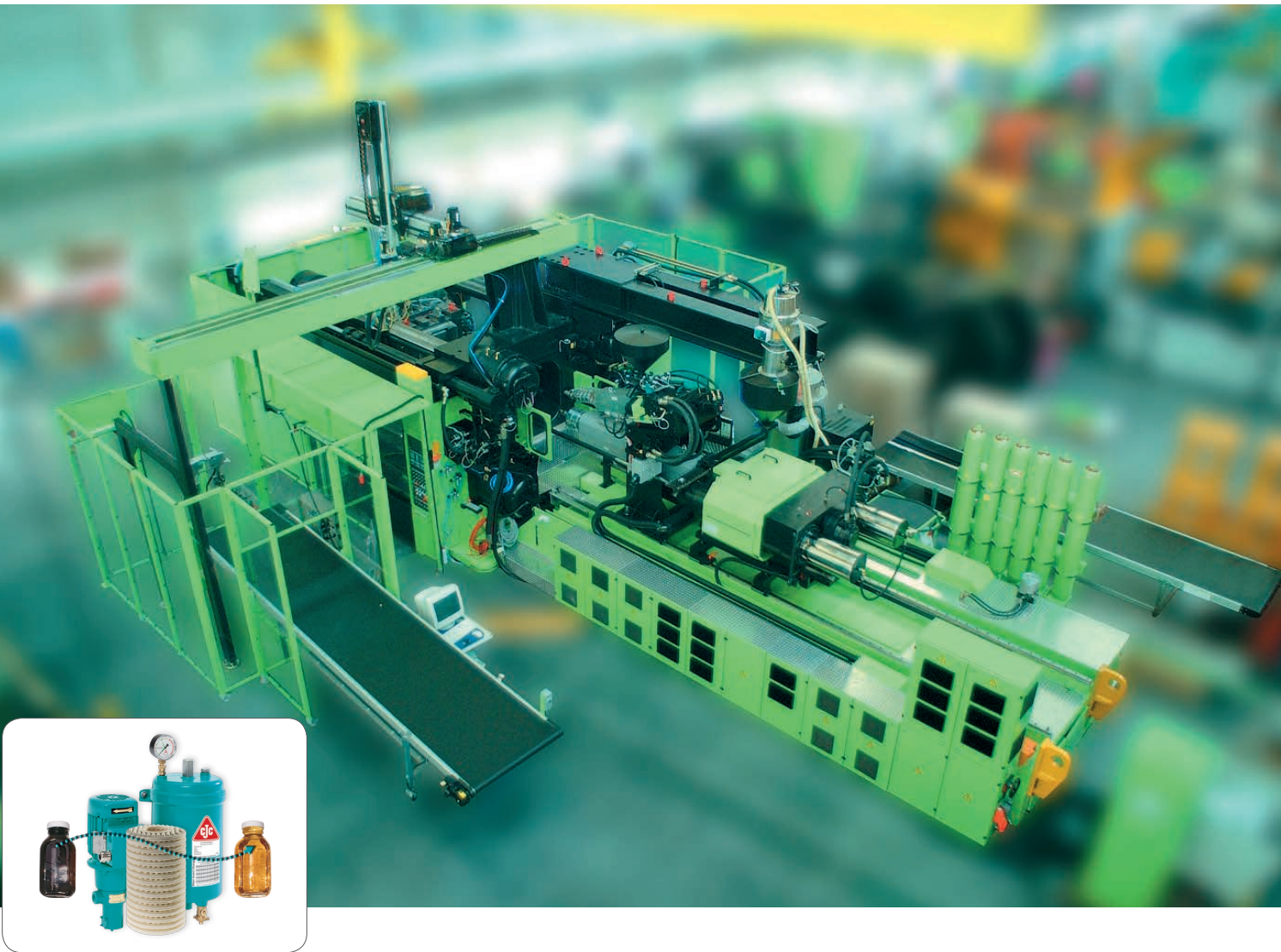


CJC™ Oil Filtration for

# Injection moulding

Solutions for removal of particles, water, acidity and oil degradation products from oils in injection moulding machines



A stable hydraulic system  
is the key to a stable production  
- running 24/7



# Why plastic injection moulders need continuous oil filtration?

## A stable hydraulic system - running 24/7

Injection moulders produce plastic parts in various sizes and complexity. A hydraulic system is applying the clamping force (e.g. 5.500 ton) and injecting the polymer into the mould.

A stable hydraulic system is the key to a stable production. Many plastic production companies has the aim of having their injection moulding machines running 24/7.

## Problem

The most common problems for the oil in injection moulding machines are:

- Oxidization, which leads to varnish which settles on components, making them stick
- Contamination from particles which generates wear on machine parts
- Water from condensation and/or leaking heat exchanger



## Consequences

Malfunction of valves and other components with varnish layer will make the system less reliable and the production will be inefficient and less precise. Particle contamination gives wear on the many different parts in the system: valves, hydraulic hoses, pumps, cylinders and pistons. The wear on components leads to risk of breakdowns and unplanned downtime. Replacing components can be very costly both in manpower and lost production. An unreliable system results in high maintenance costs.



“A hydraulic system needs oil filtration to avoid unplanned stops and to increase oil change intervals”

# Your benefits

by installing CJC™ Oil Filtration systems

Reduce your maintenance cost, fewer breakdowns and fewer oil changes by installing a CJC™ Oil Filter !

The cleanliness level achieved and maintained by oil filtration means that the predicted lifetime of machine components and oil is expected to be extended 2-10 times! The benefits that you can achieve when implementing CJC™ Oil Filters will have a positive effect on many parameters such as:

## Financial benefits

- Increased uptime
- Reduced maintenance budget
- Fewer unplanned breakdowns and stops of production
- Enhanced operational precision

## Lower energy consumption

- Lubricating capabilities remain intact
- Reduced friction
- Viscosity is maintained

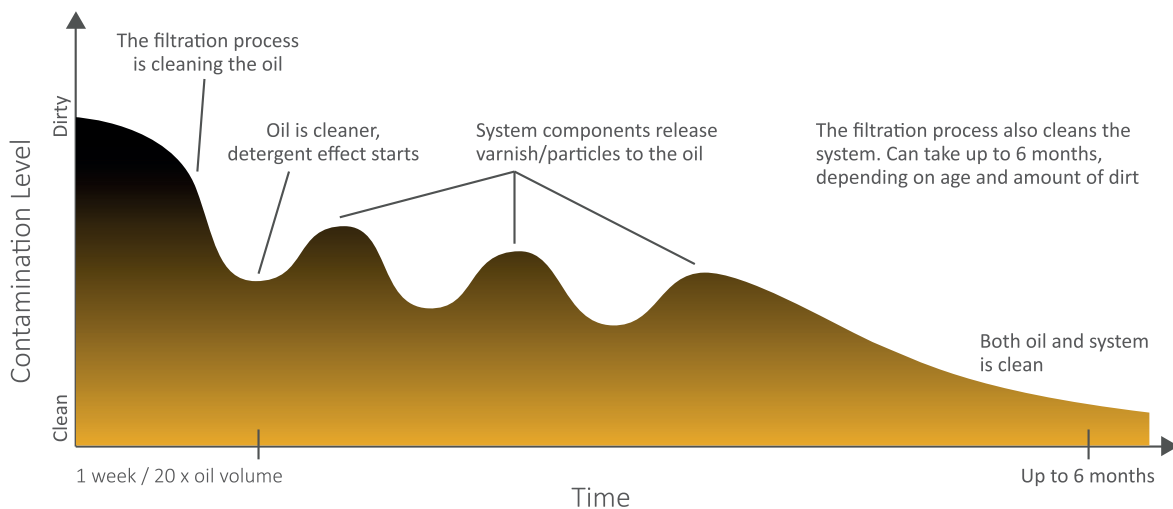
## Less maintenance

- Increased equipment reliability
- Less wear and increased life-time of components and oil
- Longer lifetime of in-line filter

## Environmental benefits

- Fewer oil changes
- Reduced top-up of oil
- Less waste oil - less use of natural resources

## Oil maintenance with continuous oil filtration



The oil filtration process over time



# Customer - No unplanned stops, ever!

Comparative oil filter test conducted by the biggest injection moulding company in Europe

One of the biggest injection moulding companies in Europe, decided to make a test to improve the quality of the oil in their machines

The headquarters of the company is based in Denmark and has several thousand injection moulding machines which are running 24 hours a day and seven days a week. Keeping maintenance costs low is crucial in a production this size. The company decided to start a programme of service and maintenance trials **with the aim of reducing costs**. One of the first areas to be investigated was **how to improve the quality of the oil** in the machines. Three machines were selected to take part in a comparative test, and all tests were run under the same conditions, except the fact that the machines were equipped with three different oil filtration solutions. It was an independent study conducted by representatives of the company.

## Tank inspection

After 11 months of operation, the three machines were stopped, and their tanks were opened for tank inspection. It appeared that only the system equipped with CJC™ Oil Filtration need no cleaning. Both photos and MPC membranes below show huge difference in the oil cleanliness. It was decided to install similar solutions on all 700 machines in this plant. (Photos below were taken by the maintenance manager - one of each machine)

## Customer statement

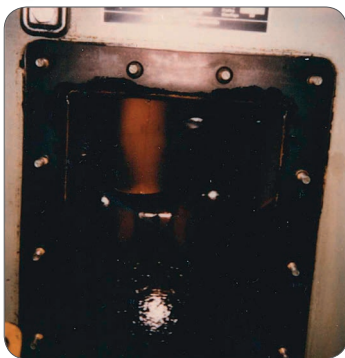
**Former Maintenance Manager,  
Mr. Lars Ryø:**

*"Installing CJC™ Oil Filters is the single best preventive maintenance element we ever implemented.*

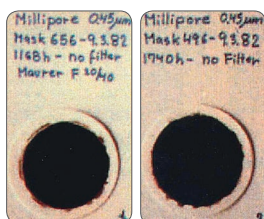
*We never have unplanned stops caused by resin or other debris in the valves, nor was cleaning of the hydraulic tanks necessary any longer".*

## Result of three different oil filtration systems

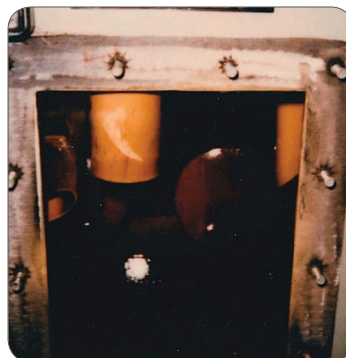
**Suction filter**  
tank needs cleaning



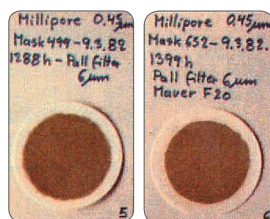
Machine no. 485 - 18,850 hours run  
This machine was fitted with only a suction filter.  
The tank is filthy



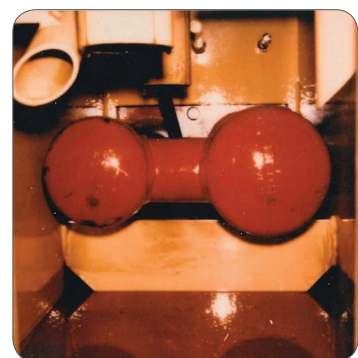
**6 µm pressure filter**  
tank needs cleaning



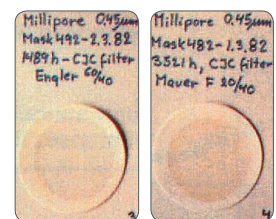
Machine no. 653 - 14,121 hours run  
This machine was fitted with a 6 micron pressure filter. The tank is not as dirty as the machine only with a suction filter, but it still needs cleaning



**CJC™ Oil Filter**  
**no cleaning needed**



Machine no. 482 - 20,261 hours run  
This machine was fitted with a CJC™ Oil Filter.  
The tank does not need to be cleaned!



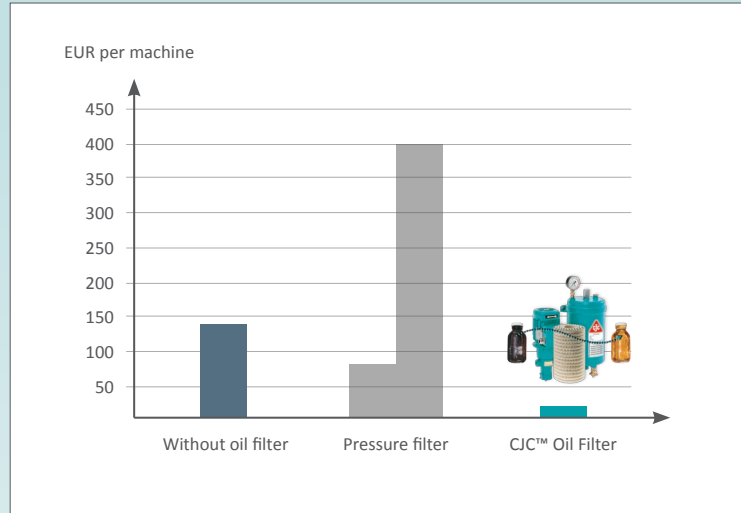
# The effect on maintenance costs

Reduced maintenance costs and reduced lost production hours

## Comparative cost of maintenance materials per machine during test

The graph (to the right) shows the cost per machine for packings, filter inserts and other maintenance parts during the 12 months trial.

The results for the machines with in-line filters are shown in two columns. The smaller column indicates the cost of materials excluding filter inserts.

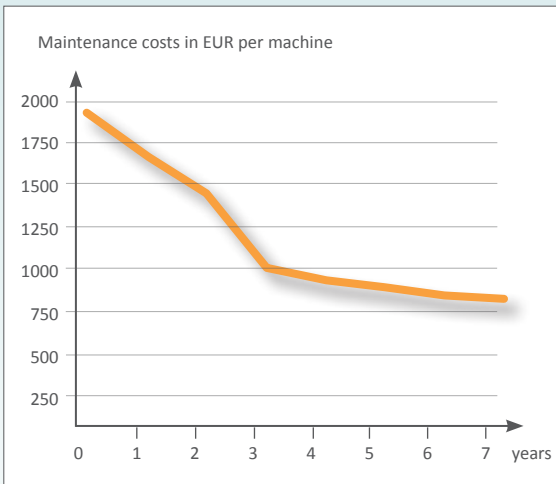


## Continued reduction in costs

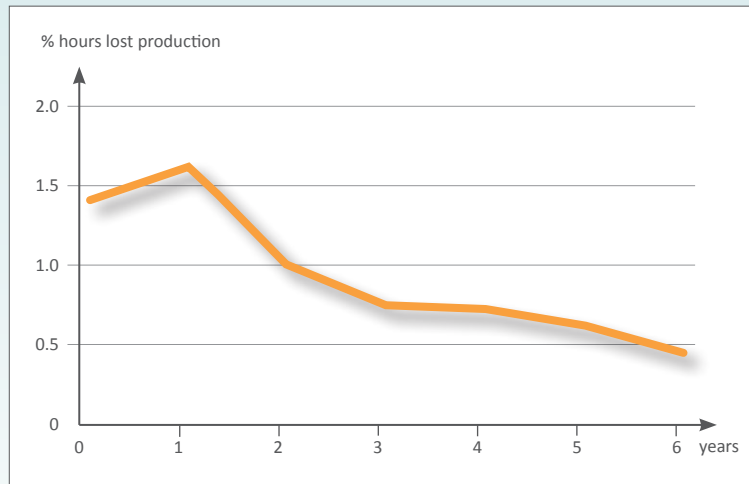
As a result of the comparative trial, the company decided to initially install oil filters on all new machines and later existing machines were equipped as well.

The maintenance department continued to monitor the performance of the machines fitted with CJC™ Oil Filters. After 7 years, all machines had CJC™ Oil Filters and the graphs below show the reduction in both costs and lost production time.

Total maintenance cost per machine, over a 7 year period



Percentage of lost production hours due to breakdowns and maintenance, over 6 years



The oil cleanliness level on these machines now ranges between ISO code 14/11 and 12/9 (according to ISO standard 4406).

## Benefits of oil filtration

In addition to these impressive results, the factory also is experiencing:

- increased repeatability in the production cycles
- increase of the average oil and pump lifetime from 15,000 to 40,000 hours
- no unplanned production stops
- cleaning of system oil tanks is now history

Furthermore, the good results achieved installing CJC™ Oil Filter for contamination control, have caused the Maintenance Department to extend main overhaul intervals from 3 to at least 5 years.

# Customer - No oil changes, ever!

CJC™ Oil Filtration solutions are always specified when ordering new ENGEL machines

## Customer

DBI Plastics A/S, Denmark

## System

54 ENGEL plastic moulding machines 20-400 tons  
Oil type: Texaco Rando HD 68

## Oil maintenance

DBI Plastics uses plastic moulding machines to manufacture protective covers and plastic plugs for industrial use. The moulding machines run around the clock. As in all other plastic moulding machines, dirt particles and oxidation products are continuously ingressed and generated in the hydraulic oil, and in the long run these can have a highly damaging effect on the machine components and on the lifetime of the oil.

## Solution

Positive experience with using CJC™ Oil Filters for maintaining the oil has led DBI Plastics to install CJC™ Fine Filters on practically all plastic moulding machines in the factory. The types installed are CJC™ Fine Filters HDU 15/25 PV with CJC™ Filter Inserts BG 15/25. When ordering new ENGEL machines, DBI Plastics always specifies CJC™ Oil Filters on their machines.

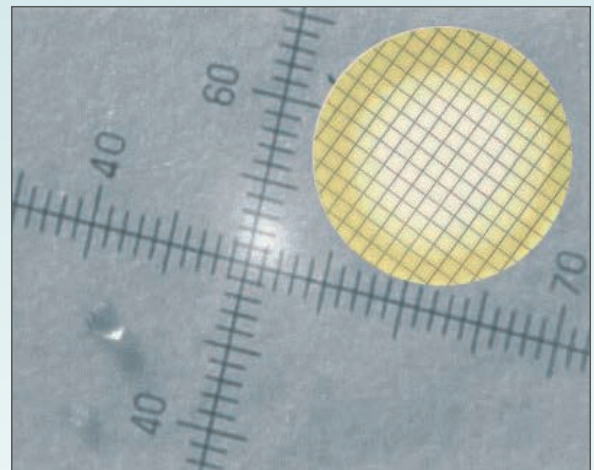
## The result

Oil samples are continuously taken from the machine oil in order to analyse the present state of the oil. Only when the test results show that the oil can no longer be used, the oil is replaced with new oil.

Going through the oil samples taken recently, the customer discovered a machine, which has used the same oil for a period of 16 years (see oil sample membrane to the right).



ENGEL Plastic moulding machine at DBI Plastics with CJC™ LG 15/25 Fine Filter fitted



Latest oil sample from: **Machine 283**, which was in operation for the first time in 1991  
Type: ES600/125 tons

**Lifetime of the oil: 16 years**

## Customer statement

**DBI Plastics, Mr. Preben Jensen:**

*"I can only remember changing oil on one of my plastic moulding machines, and that was because of a leak from the oil cooler. Otherwise we run the same oil throughout the lifetime of a machine. I am pleased with the CJC™ Fine Filters, and when I buy new machines, I always specify them with CJC™ Oil Filter."*

# Your natural solution

Round-the-clock removal of particles, water, acidity and oil degradation products, all in the same operation

## CJC™ Oil Filter - Key figures

The CJC™ Oil Filters are offline depth filters for hydraulic and lubrication oils.

CJC™ Offline Oil Filters have an unmatched high dirt holding capacity, and remove particles, water, acidity and oil degradation products, all in one and the same operation.

Our oil filters are installed offline, meaning they are not system critical e.g. machinery shutdown is not necessary when changing filter insert.

The cleanliness level achieved and maintained by offline oil filtration means that the predicted lifetime of machine components and oil will be extended 2-10 times!

Using CJC™ Offline Oil Filters will have a positive effect on your maintenance budget as well as increase your productivity and reduce your energy consumption.

Our product range covers tailor made solutions for all system volumes.

## CJC™ HDU Series

CJC™ Fine Filters are offline oil filtration systems with integrated circulating pumps for offline installation. The oil filters are recognised around the world as highly efficient purification systems for industrial applications.

CJC™ Fine Filters have a 3 µm absolute filtration ratio and remove particles, water, acidity and oil degradation products from oils.



CJC™ HDU 15/25



CJC™ HDU 27/27



CJC™ HDU 27/54

## CJC™ Filter Insert system

All CJC™ Filter Inserts have a 3 µm absolute filtration ratio. The CJC™ Filter Inserts are produced of **100% natural cellulose fibres** from sustainable resources - no metal, no plastic, no chemicals.

- **Particles** down to 0.8 µm are retained in the unique CJC™ depth filter media (cellulose).
- **Water** is removed either by absorption or separation according to oil system requirements.
- **Acidity** can be neutralized with ion exchange resin media.
- **Oil degradation products** are removed by the attraction to the polar fibers.



### Modular build-up

The modular build-up of the CJC™ Filter Inserts means that a CJC™ Fine Filter can be designed to fit any applications and requirements



## What do we do differently?

Compared to a standard in-line filter, CJC™ Offline Oil Filters have proven their many benefits.

### The main benefits are:

- Huge dirt holding capacity
- 24/7 offline oil filtration
- Fine filtration capabilities with the removal of particles, water, acidity and oil degradation products, all in one and the same operation

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of innovation &  
market leadership



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