



INDEPTH KNOWLEDGE OF HIGH PRESSURE
**COMPARATIVE RATIONAL-
ISATION CALCULATIONS**

INTRODUCTION



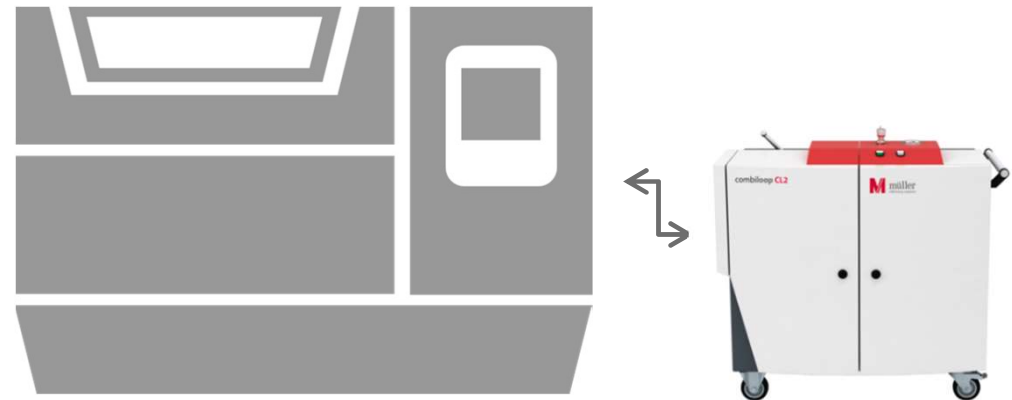
The calculations are based on a turning / milling centre that now operates in combination with combiloop CL3 and automatic reversible flow filter.

Basic data:

// Turning/milling centre

// Machine running times (with combiloop):
209 days a year / 21 hours a day

// Machine hour rate: approx. € 68/hour



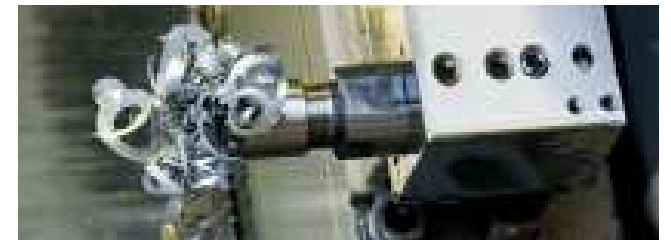
LONGER TOOL SERVICE LIFE

	Characteristic	Benefit
Without combiloop CL3		
Drill wear after 150,000 turned parts	107 drills (incl. regrinding)	
Costs per drill	96,00 €	
Total costs per drills	107 x 96,00 €	10.272,00 € per year
With combiloop CL3		
Longer tool service life:	7 times more	
Drill wear after 150,000 turned parts	15 drills (incl. regrinding)	
Costs per drill (internally cooled)	320,00 €	
Total costs per drills	15 x 320,00 €	4.800,00 € per year
Potential savings with combiloop per machine		5.472,00 € per year



DRILLING WITHOUT CHIP REMOVAL

	Characteristic	Benefit
Without combiloop CL3		
Chip removal	required	
Machining time for 150,000 turned parts	209 production days	
Costs based on machine hour rate:	209 days x 21 hours x 68,00 €	298.452 € per year
With combiloop CL3		
Chip removal	not necessary	
Time savings per part	up to 8 %	
Machining time for 150,000 turned parts	192 production days	
Costs based on machine hour rate:	192 days x 21 hours x 68,00 €	274.176 € per year
Potential savings with combiloop per machine		24.276,00 € per year



ENERGY EFFICIENCY (ELIMINATION OF COOLING)



	Competitive product (screw pump)	combiloop CL3 (piston pump)	Benefit
Compared with rival constant pumps (e.g. screw pump)			
Power consumption of the pump with maximum flow rates of 30 l/min and high pressure of 80bar	7,0 KW	4,0 KW	
Energy savings	-	3,0 KW	
Additional energy savings due to adapting pump	-	1,0 KW	
Potential savings with combiloop per machine	209 days x 21 hours x 4,0 KW x 0,15 €		2.633 € per year
Screw pumps require additional cooling:			
Additional cooling	required	not necessary	
Power consumption	Conversion of excessive power into heat	adapted	
Potential savings with combiloop per machine	209 days x 21 hours x 3,0 KW x 0,15 €		1.975 € per year



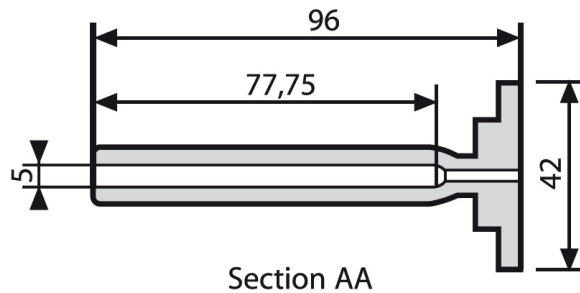
OVERVIEW OF RATIONALISATION POTENTIAL



Rationalisation area	Description	Advantage	Benefit
High pressure	<ul style="list-style-type: none"> Drill wear Working without clearing 	Sevenfold reductions 8% time savings	5.472 € 24.276 €
Full flow or bypass filtration	<ul style="list-style-type: none"> No filter changes, no consumables Improved CL life for full flow filtration 	Time and cost advantage 10% cost savings	1.380 € 950 €
Energy efficiency	<ul style="list-style-type: none"> Regulating pump effect Cooling for constant pump 	Approx. 3–4 kWh savings Does not apply to CL + CS (cost advantage)	2.633 € 1.975 €
Process reliability	<ul style="list-style-type: none"> Improved quality output multishift operations possible 	Here, the advantage can be estimated only with caution	6.000 €
Total		192 production days/year 21 hours/day	42.686 €

- // Not every one of these effects can be applied accumulatively at every customer location
- // Yet most customers will find one or two examples that they can transfer in their minds to their own situation
- // Investments pay off – positive ROI achieved

IN-HOUSE DEEP HOLE DRILLING VERSUS OUTSOURCING



	Characteristic	Benefit
Without combiloop		Per year
External production	134.400 parts x 0,33 €	44.352 €
With combiloop CL3		
Drill wear per part	134.400 parts x 0,03 €	4.032 €
Additional machine time	134.400 parts x 0,15 €	20.160 €
Cost per piece (In-House production)	134.400 parts x 0,18 €	24.192 €
Potential savings with combiloop per machine		20.160 €

// Sliding headstock automatic lathe without high pressure – deep holes could not be drilled

// So drilling outsourced

// This example does not illustrate the time saved by the advantage that the part is finished on the one machine!

// Example from practice:

// Part according to drawing, see Figure

// Hole depth: 77.75 mm

// Hole diameter: 5 mm

// 192 production days outputting 700 parts a day

// Total annual production approx. 134,400 parts

