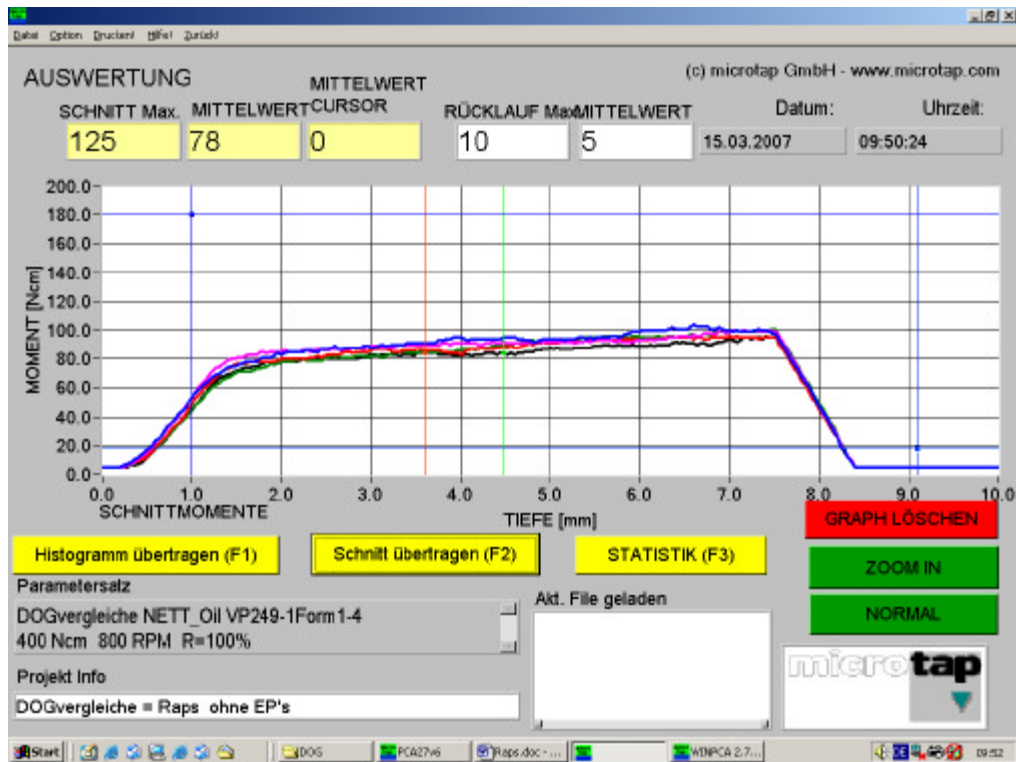
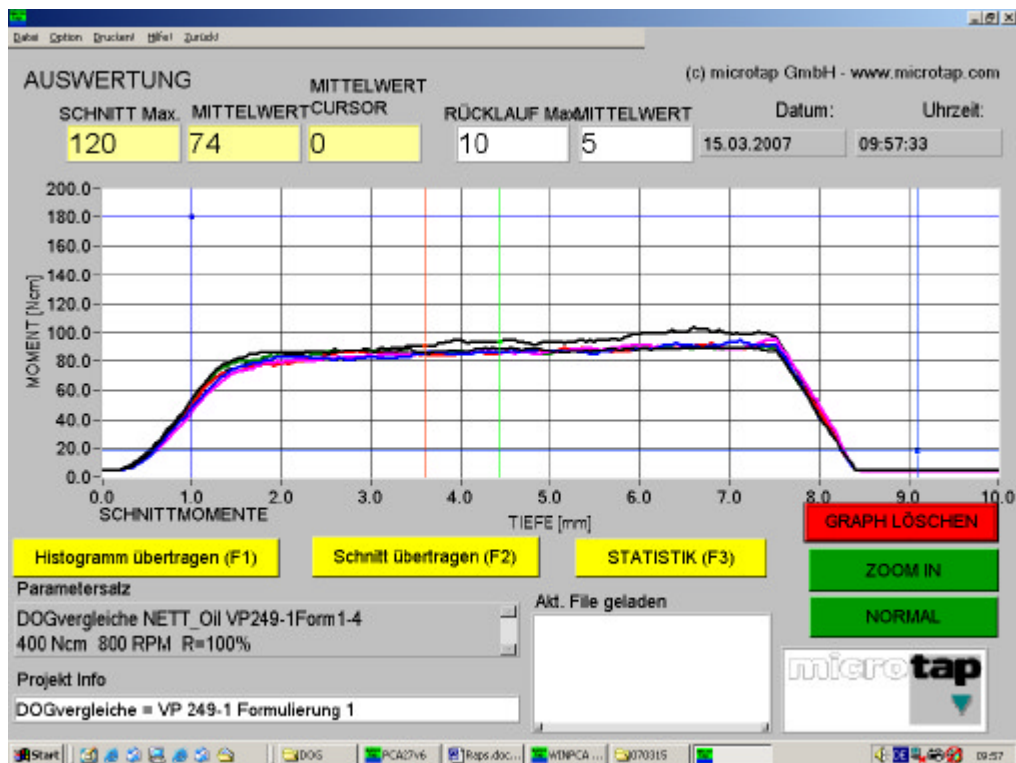


Vergleichsmessungen

Graphen einer Schmiermittel-Optimierung
Referenz Rapsöl ohne EP's



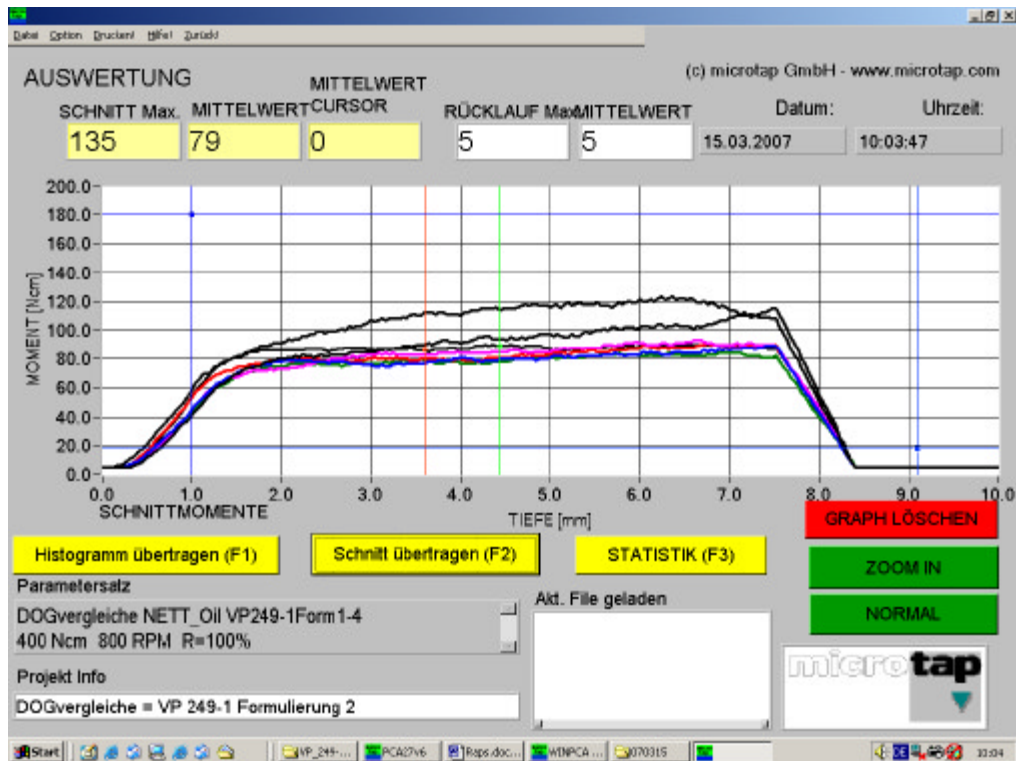
RapsÖl ohne EP's



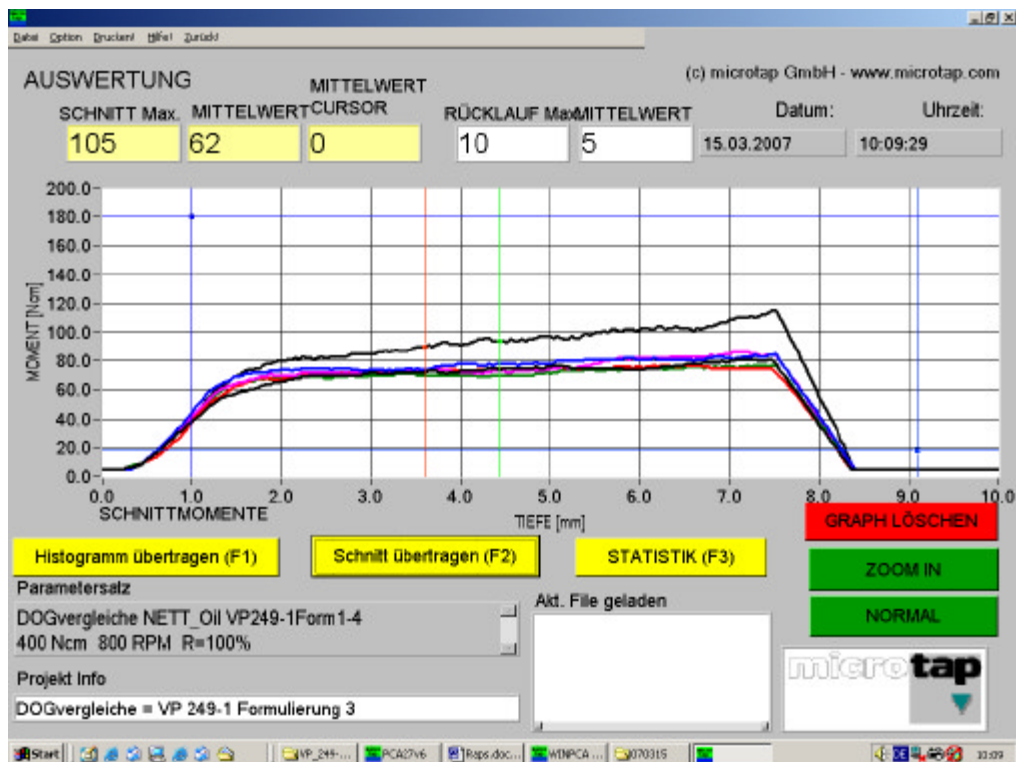
Vergleichs – Messung

Vergleichsmessungen

Graphen einer Schmiermittel-Optimierung



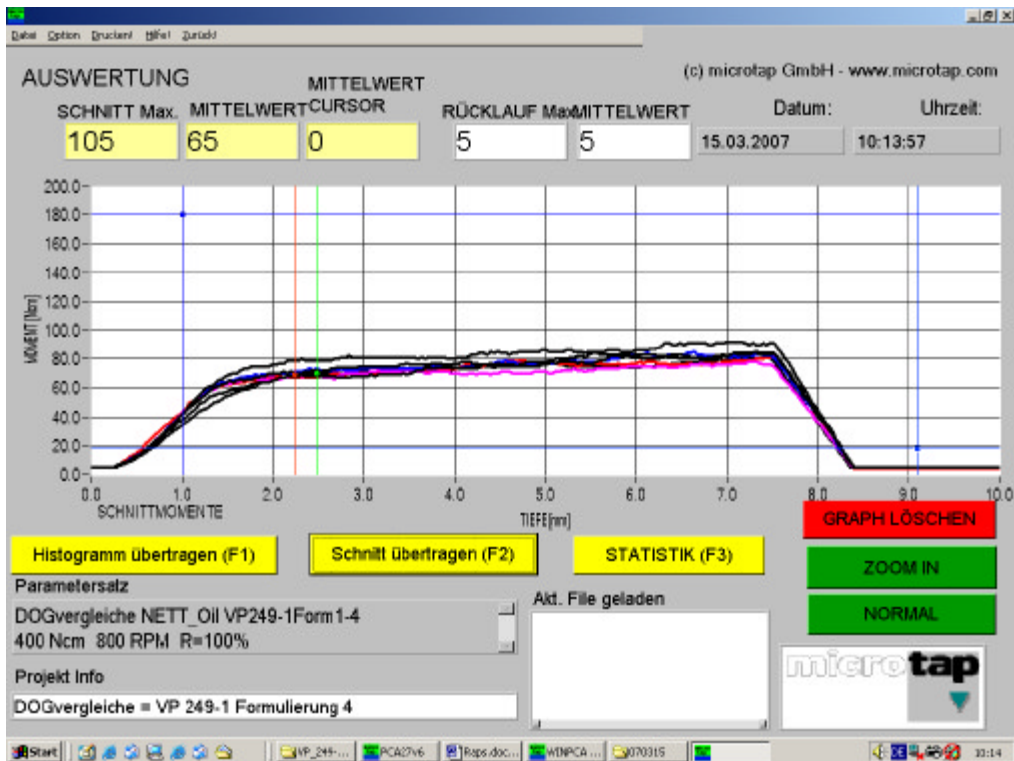
Vergleich – Messung 2



Vergleich – Messung 3

Vergleichsmessungen

Graphen einer Schmiermittel-Optimierung



Vergleich – Messung 4

microtap LABOR 15.3.07

M4 BLINDHOLE TO 6MM 1.4571 Forming				
FLUID/HOLE	Value in Ncm			
	CUT	MEAN	STAT	STD DEV
A1	135	85	45,70	48,10
A2	140	89	47,50	49,50
A3	145	88	46,80	49,30
A4	145	94	50,20	53,40
A5	150	91	48,60	51,20
AVERAGE	143,00	89,40	47,76	50,30
DIFF.. OF B	89,94%	95,11%	95,33%	93,91%
DIFF. OF C	98,62%	94,70%	95,06%	95,45%
DIFF. OF D	81,25%	85,14%	85,41%	84,97%
DIFF. OF E	83,63%	85,80%	86,15%	85,40%
DIFF. OF W	115,32%	118,25%	117,06%	118,97%
FLUID/HOLE				
B1	155	87	46,60	49,30
B2	155	94	49,90	53,20
B3	145	91	48,80	51,20
B4	165	99	52,40	56,20
B5	175	99	52,80	57,90
AVERAGE	159,00	94,00	50,10	53,56
DIFF. OF A	111,19%	105,15%	104,90%	106,48%
DIFF. OF C	109,66%	99,58%	99,72%	101,63%
DIFF. OF D	90,34%	89,52%	89,59%	90,47%
DIFF. OF E	92,98%	90,21%	90,37%	90,93%
DIFF. OF W	128,23%	124,34%	122,79%	126,68%
FLUID/HOLE				
C1	140	93	49,60	52,10
C2	140	97	51,30	53,80
C3	160	98	52,00	54,80
C4	140	90	48,10	49,70
C5	145	94	50,20	53,10
AVERAGE	145,00	94,40	50,24	52,70
DIFF. OF A	101,40%	105,59%	105,19%	104,77%
DIFF. OF B	91,19%	100,43%	100,28%	98,39%
DIFF. OF D	82,39%	89,90%	89,84%	89,02%
DIFF. OF E	84,80%	90,60%	90,62%	89,47%
DIFF. OF W	116,94%	124,87%	123,14%	124,65%
FLUID/HOLE				
D1	165	103	54,50	57,80
D2	185	105	56,10	59,30
D3	175	106	56,40	59,40
D4	175	104	55,60	59,00
D5	180	107	57,00	60,50
AVERAGE	176,00	105,00	55,92	59,20
DIFF. OF A	123,08%	117,45%	117,09%	117,69%
DIFF. OF B	110,69%	111,70%	111,62%	110,53%
DIFF. OF C	121,38%	111,23%	111,31%	112,33%
DIFF. OF E	102,92%	100,77%	100,87%	100,51%
DIFF. OF W	141,94%	138,89%	137,06%	140,02%
FLUID/HOLE				
E1	175	100	53,20	56,20
E2	170	101	54,20	57,90
E3	170	104	55,60	58,50
E4	165	105	55,80	59,20
E5	175	111	58,40	62,70
AVERAGE	171,00	104,20	55,44	58,90
DIFF. OF A	119,58%	116,55%	116,08%	117,10%
DIFF. OF B	107,55%	110,85%	110,66%	109,97%
DIFF. OF C	117,93%	110,38%	110,35%	111,76%
DIFF. OF D	97,16%	99,24%	99,14%	99,49%
DIFF. OF W	137,90%	137,83%	135,88%	139,31%
FLUID/HOLE				
W1	125	72	39,10	40,60
W2	125	78	41,90	43,10
W3	125	76	41,10	42,40
W4	125	76	41,10	42,70
W5	120	76	40,80	42,60
AVERAGE	124,00	75,60	40,80	42,28
DIFF. OF A	86,71%	84,56%	85,43%	84,06%
DIFF. OF B	77,99%	80,43%	81,44%	78,94%
DIFF. OF C	85,52%	80,08%	81,21%	80,23%
DIFF. OF D	70,45%	72,00%	72,96%	71,42%
DIFF. OF E	72,51%	72,55%	73,59%	71,78%

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27. Mrz 07



Description

CUT = Maximum torque encountered during the cut.
 MEAN = Mean value of torque exerted over the depth of the cut.
 STAT = Mean value from Statistics screen
 STD DEV = Standard Deviation number from Statistics screen

FLUID/HOLE = Example - Fluids No.1 to No.5 used / Hole sequence tagged on bar.

FLUID W = Standard fluid for comparison / REFERENCE

The MEAN value is the evaluation statistic of true energy extended.

Material 1.4571 (V4A) Plates with blindhole

Plate - 150mm X 150mm with 3.8mm diameter holes with drilled 10 mm depth
 Measurement-Tool Emuge M4-6HX 1Drück-S

MEGATAP II-G8 1000RPM / 8mm depth

WinPCA - Measurement equipment

Fluid Comparative Analysis

Summary:	Fluid	MValue	MDeviate	WDeviate
	A	89,40	91,79%	118,25%
	B	94,00	96,51%	124,34%
	C	94,40	96,92%	124,87%
	D	105,00	107,80%	138,89%
	E	104,20	106,98%	137,83%
	W			75,60
Mean		97,40	100,00%	

MValue = average of mean values from each fluid.

MDeviate = percent of deviation from the average mean value.

WDeviate = percent of deviation from the sample fluid mean.

The lowest deviation percentage is under the prepared

conditions the best lubricity.

The smaller torque value for same work determines

the best performance of the tapping tool.

Fluid Standard Deviation Analysis

(a measure of smooth cutting)

Summary:	Fluid	Std Dev	MDeviate	WDeviate
	A	50,30	91,57%	118,97%
	B	53,56	97,50%	126,68%
	C	52,70	95,94%	124,65%
	D	59,20	107,77%	140,02%
	E	58,90	107,22%	139,31%
	W			42,28
Mean of StdDev		54,93	100,00%	

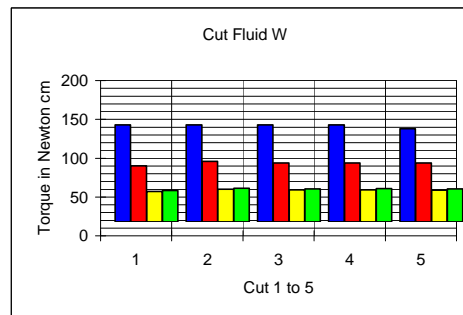
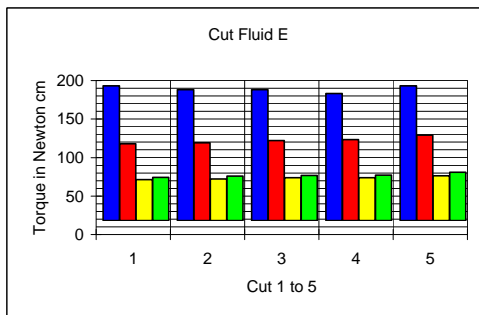
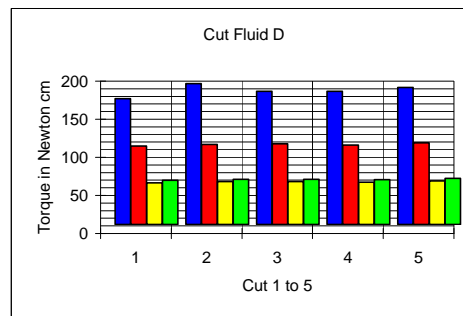
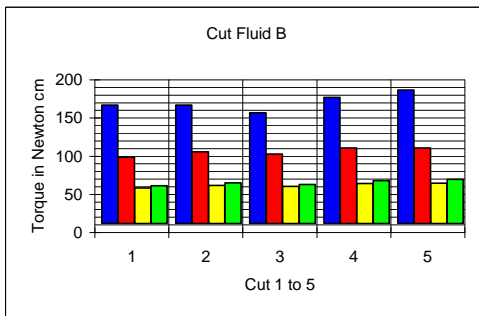
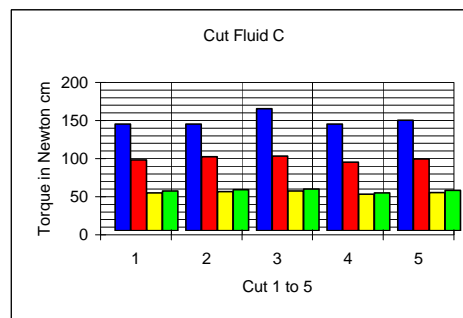
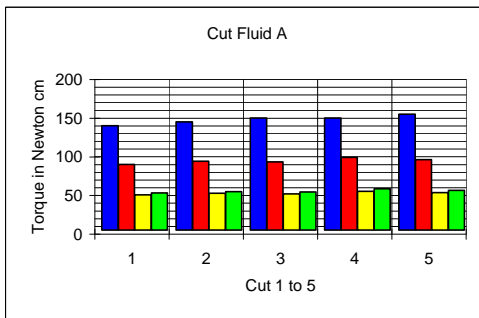
A = No.1
B = No.2
C = No.3
D = No.4
E = No.5
W= Standard Rape Oil (w/o ads)

Test performed by microtap Germany

Oliver Posch - Roger Rowley - K. M. Mueller

Test conducted January 2007

M4 BLINDHOLE TO 6MM 1.4571 Forming



CUT MEAN STAT STD DEV

CUT = Maximum torque encountered during the cut.
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