



**FILTER
TECHNOLOGY**

cleaner fluids mean better business

CASE STUDY

Mining

Case No : 2 - 6 - 23

Hitachi EX3600 Swing Box : Roche Mining

Roche Mining

We were approached by Roche Mining about filtering the swing box oils in their Hitachi EX 3600, Cumnock Mine was chosen as the site to design the system on.



Site
Attention To:
Machine: **ROCCUM Roche Cumnock**
Sample Location: **3600 Hitachi Right Rear Swing Gearcase**
Oil Type: **86W140**

Oil Test



				21-Feb-06	9-Mar-06	17-Mar-06
Sample Date				21-Feb-06	9-Mar-06	17-Mar-06
Analysis Report No.	-	-	-	272,622	275,156	276,888
Service Meter Reading	-	-	-	0hrs	0hrs	18286hrs
Electric SMR	-	-	-	-	-	-
Oil Hrs	-	-	-	-	188	336
Oil Changed?				No	No	No
Wear Metals	Limit	ppm	ppm	ppm	ppm	ppm
lead	300			0	0	0
iron	40			8	7	7
aluminium	80			1	0	0
copper	16			2	2	1
chromium	16			0	0	0
tin	16			0	0	0
nickel	16			0	0	0
silver				0	0	0
titanium				0	0	0
Contaminants	Limit	ppm	ppm	ppm	ppm	ppm
silicon	80			8	3	3
sodium	30			7	6	6
vanadium				0	0	0
Oil Additives	Limit	ppm	ppm	ppm	ppm	ppm
magnesium				4	4	4
zinc				9	17	18
molybdenum				0	0	0
calcium				262	176	177
phosphorous				157	233	245
boron				66	63	62
barium				0	0	1
Physical Tests						
TBN				0	0	0
TAN				0.00	0.00	0.00
fuel dilution %				0	0	0
water %	0.1			< 0.1	< 0.1	< 0.1
viscosity index				97	97	97
visc @ 100oC - Cst	26	-	-	24.60	24.88	25.00
visc @ 40oC - Cst	344			322	332	332
FTIR Analysis						
soot - abs				0	0	0
glycol%				0	0	0
water ppm				221	0	0
oxidation - abs				0	0	0
nitration - abs				0	0	0
sulphation - abs				0	0	0
Particle Analysis						
particle count in 1ml				46668	13374	4972
ISO-4406 6um \ 14um	-	+	+	21/17	17/13	16/13
PQ90 Fe - mg \ ltr	300			21	8	2

It was decided to run a complete new circuit running a piggy back pump off the back of the air conditioning pump, through a pressure compensating flow control valve, then into a flow divider valve driving two hydraulic motors couple to four pumps flowing 2 litre per minute.

Roche is keen to use a synthetic oil in their gearboxes but cost and lack of life of the current oil due to contamination has prevented this happening up to now, Roche also believe by improving the oil quality and reducing the contaminants within the oil will see a prolong life of the gearbox components.

Based on early reports this is all on track, the ISO of the oil was at 21/15 and three weeks after the units were started now sees the oil at 16/13, PQ has been reduced by 90%, water content has been reduced by 100% and silicon has been reduced by 50%.

The particulate contamination has been reduced by 98%