



Multotec Group of Companies

"Solutions at Work"

Multotec Hawkeye Maintenance Programme



MULTOTEC

Multotec is a leading South African manufacturer and Supplier of world class industrial products and equipment to the minerals processing industry

Presented by: Brent Combrink



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- ❖ **Products and users**
- ❖ **Benefits of outsourcing**
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HAWKEYE

- ❖ **Hawkeye is part and parcel of a Maintenance Model that Multotec has developed.**
- ❖ **Hawkeye is a planned monitoring and recording programme that allows for accurate maintenance schedules.**
- ❖ **It should be noted that the Hawkeye programme does not necessarily have to be part of the maintenance programme but also that the Hawkeye system can not be purchased separately.**





**PRODUCTS TO BE CONSIDERED FOR
MAINTENANCE CONTRACTS:**

- ❖ **Screen media**
- ❖ **DMS and de grit Cyclones**
- ❖ **Scrubber linings**
- ❖ **Wear linings**
- ❖ **Magnetic Separators**
- ❖ **Flotation products**





CURRENT USERS OF THE SYSTEM



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- ❖ De Beers Kimberley (maintain 2 plants)
- ❖ Amplats contract (various plants)
- ❖ Sasol Secunda
- ❖ X Strata (Tavistock, South Witbank)
- ❖ Amcoal maintenance (KK, Landau)
- ❖ Sishen – SEP
- ❖ Australia (Bulga)





DE-CENTRALIZED BRANCHES



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- ❖ **Branches in:**
 - ❖ Middelburg
 - ❖ Rustenburg
 - ❖ Cape Town
 - ❖ Kimberley
 - ❖ Kathu (Sishen)
 - ❖ Secunda
 - ❖ Ghana, Zambia, Australia, Chile
- ❖ **Benefits:**
 - ❖ Close to customer
 - ❖ Stock holding facilities
 - ❖ Emergency services
- ❖ **Disadvantage:**
 - ❖ Costs of establishing branches





BENEFITS OF OUTSOURCING ?

Focused approach improves: (Screening)

- ❖ 1) Process Efficiency:
 - ❖ Accurate cut points
 - ❖ Reduced misplacement
 - ❖ Improved de-sliming

- ❖ Above achieved by:
 - ❖ Correct apertures on screens
 - ❖ Correct deck layout
 - ❖ Timeous replacement of worn panels





BENEFITS OF OUTSOURCING ?



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- ❖ **3) Improved economics:**
 - ❖ **No Stock Holding**
 - ❖ **No Procurement**
 - ❖ **Simplified Budgeting and Forecasting**





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WHY HAWKEYE?

- ❖ **Previous:**
- ❖ **Excel sheets could not obtain detailed reports**
- ❖ **Now:**
- ❖ **Accurate, continuous recording**
- ❖ **Database:**
- ❖ **- obtain information**
- ❖ **- generate reports**
- ❖ **All screens of all sections**
- ❖ **History of a particular panel position**
- ❖ **Web-based enables easy access anywhere, anytime.**
- ❖ **The success of the program depends on a disciplined approach**





HAWKEYE ADVANTAGES?



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- Allows investigation of all associated problems
- Forces regular inspections of equipment
- It identifies problem areas (high wear areas)
- It generates a equipment usage history
- Effective maintenance reduces running costs
- Allows for effective control of stock levels
- Report gives a complete [Screen Layout](#)
- Future applications would possibly include the use of computer chips to monitor products.
- Hand-held PDA's could be used to scan products

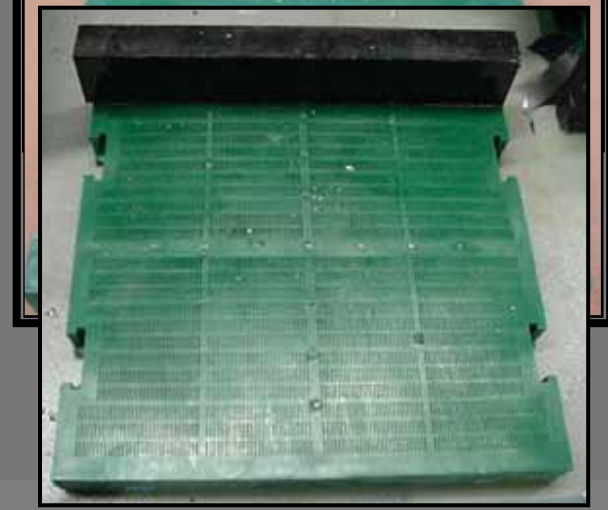
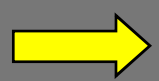
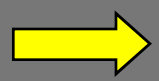
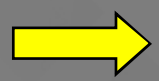




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Screen Layout

FEED END		DESCRIPTION
1	2 3 4 5 6 7 8 9 10	
1	Black	I.M. PLAIN PANEL 305 x 305 x 30 APERTURE: 0.8 X 8.0 WITH DEFECTORS
2	Red	
3	Red	I.M. PLAIN PANEL SOLID 305 x 305 x 40
4	Red	
5	Green	I.M. PANEL WITH RET. BAR 305 x 305 x 30 APERTURE: 0.8 X 8.0 WITH DEFECTORS
6	Green	
7	Green	
8	Green	
9	Green	
10	Green	
11	Green	
12	Green	
13	Green	
14	Green	
15	Purple	I.M. PANEL WITH RET. BAR AND WIERBAR 100mm HIGH 305 x 305 x 30 APERTURE: 0.8 X 8.0 WITH DEFECTORS
16	Purple	
17	Purple	
18	Purple	
19	Purple	
20	Purple	
21	Purple	
22	Purple	
23	Purple	
24	Yellow	
25	Purple	
26	Yellow	
27	Purple	
28	Yellow	Losi solid 305 x 450 x 30
29	Purple	
30	Yellow	
31	Purple	
32	Yellow	TOTAL PANELS PER DECK
33	Purple	
34	Blue	SIDE LINERS: 250mm x 20mm MULTOSLIP
	Blue	



107183





Hawkeye Reports Example



MULTOTEC

- Customer: De Beers Kimberley
- Section
 - CTP Blue Area

SmSys Customer Plant Details				1
			14/09/2006 11:30	
Code	Plant	Section	Description	
CTP	COMBINED TREATMENT PLANT	CTP - Blue Area		
CTP	COMBINED TREATMENT PLANT	CTP - Red Area (Recovery)		
KMSP	SAMPLING PLANT	Sampling - Blue Area		
KMSP	SAMPLING PLANT	Sampling - Red area		
NTP	NEW TREATMENT PLNT	NTP - Bulk Plant		
NTP	NEW TREATMENT PLANT	NTP - Red Area (Recovery)		
NTP	NEW TREATMENT PLANT	NTP - Upgrade Plant		



Hawkeye Reports Example



MULTOTEC

- Customer: De Beers Kimberley
- Section: CTP Blue Area
- Screen:
 - 3121-SCB-01T Scrubber Top Deck

Reference #	Width	Length	Designation	Module	Machine Type	Order	L.Insp
3113-SCS-01	10	27	SIZING SCREEN	1	VIBRAMECH. MODEL - INC1-72-30	1	29/06/2005
3113-SCS-02	10	27	SIZING SCREEN	2	VIBRAMECH. MODEL - INC1-72-30	2	30/12/2005
3121-SCB-01T	12	33	SCRUBBER TOP DECK	1	SIEBTECHNIK BANANA	3	29/05/2006
3121-SCB-01B	12	31	SCRUBBER BOTTOM DECK	1	SIEBTECHNIK BANANA	4	18/04/2006
3122-SCB-01T	12	33	SCRUBBER TOP DECK	2	SIEBTECHNIK BANANA	5	31/05/2006
3122-SCB-01B	12	31	SCRUBBER BOTTOM DECK	2	SIEBTECHNIK BANANA	6	31/05/2006

14/09/2006 11:31





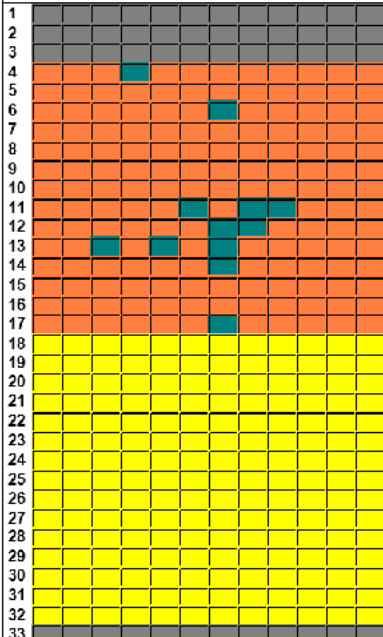
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Customer : De Beers - Kimberley Mine
Plant : COMBINED TREATMENT PLANT
Section : CTP - Blue Area
Screen Ref. # 3121-SCB-01T
Designation : SCRUBBER TOP DECK
Module : 1



Panel Grid Width : 12
Panel Grid Length : 33

A B C D E F G H I J K L



Screen layout



Item number



Colour code



Item No.	Description 1	Description 2	Search Text	QTY
990000	305X305X30/24X24	T1H TX7	MD Panel Rubber	0
125405	305X305X40/SOLID	T2H	MD Panel Rubber	46
151603	305X305X30/24X24	T1H VIBRARI AST	MD Panel Rubber	0
152656	305X305X30/22X22	T1H TDS	MD Rubber Panel	12
990000	305X305X30/27X27	T1	Rubber	150
990001	305X305X30/27X27	T1 50mm VIBRARI	Rubber	0
990004	305X305X30/27X27	T1	Rubber	0
990005	305X305X30/22X22	T1	Rubber	180



Direction of flow





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History of position B1

Replacement Code

History For Screen : 3121-SCB-01T								1
Designation : SCRUBBER TOP DECK								
Module : 1								14/09/2006 11:32
Position	Item No	Date	Expected	Actual Days	Code	Inspected/Installed By	Captured	Comments
B1	125465	03/01/2006		113	NW	paddy p	18/02/2006	
B1	125465	12/09/2005		14	NW	P	07/12/2005	
B1	125465	29/08/2005		14	NW	p	07/12/2005	Stringers on rows 1 to 6 badly worn and were only welded
B1	125465	15/08/2005		28	NW	P	07/12/2005	
B1	125465	18/07/2005		14	NW	P	07/12/2005	
B1	125465	04/07/2005		10	NW	P	07/12/2005	
B1	125465	24/06/2005		18	NW	P	07/12/2005	
B1	125465	06/06/2005		28	NW	P	07/12/2005	
B1	125465	09/05/2005		14	NW	P	07/12/2005	
B1	125465	25/04/2005		0	NW	P	07/12/2005	
B1	125465	01/01/2005		0	New	PADDY	07/12/2005	
				Average	28	(Excluding Zero's)		



Replacement codes



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SmSys Panel Replacement Codes	
Code	Description
AC	APIERTURE CHANGE
AW	APIERTURE WEAR
BA	BACTERIAL ATTACK
BL	SCREEN BOLTS AND/OR NUTS LOOSE
DB	DAMS BREAKING
HO	HOLES OVERSIZE
IF	INTERNAL FRAME
NEW	NEW
NS	NEW SCREEN INSTALLED
NW	NORMAL WEAR
PC	PLANNED CHANGEOUT
PL	PANEL LOOSE/MISSING
PM	PIN MISSING
PSM	PIN AND SLEEVE MISSING
PT	PANEL TYPE CHANGED
RB	RAILS BROKEN OR DAMAGED
SF	SCREEN FAILURE (BEAMS ,STRINGERS,MECHANICAL)
ST	SADDLE TOP CONVERSION
TP	TEST PANEL
UD	UNKNOWN DAMAGE
WD	WELDING DAMAGE

Normal wear



Runners Broken





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Reports: Number of changes

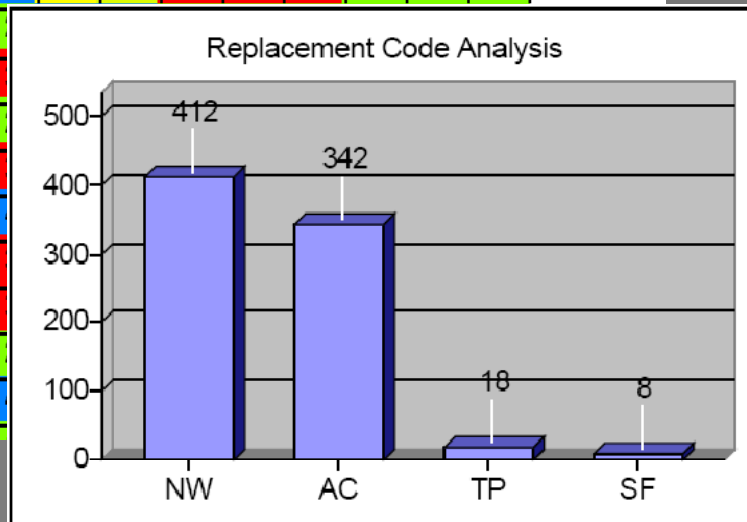
Screen Ref. # 3121-SCB-01T

Designation : SCRUBBER TOP DECK

Module : 1

Number Of Panel Changes, Any Item No, For The Period 0

	A	B	C	D	E	F	G	H	I	J	K	L
1	5	10	8	2	1	2	3	1	1	2	1	0
2	9	10	13	13	7	7	4	4	2	2	1	1
3	5	10	9	7	8	4	5	2	3	2	3	2
4	3	3	3	3	3	4	2	2	1	1	1	1
5	4	3	1	2	4	2	1	2	1	1	2	1
6	2	1	3	4	2	3	4	1	2	1	1	1
7	3	2	2	4	3	3	2	3	2	1	1	1
8	4	3	2	5	5	3	2	1	2	2	1	1
9	4	4	4	4	8	6	3	3	3	1	1	1
10	3	2	2									
11	4	2	3									
12	3	2	3									
13	3	2	8									
14	4	2	2									
15	4	4	1									
16	1	3	1									
17	3	4	1									
18	2	2	1									
19												
20												



- Colour-coding indicates number of changes during the specified period
 - Light green – 2 and less
 - Light blue - 11 and more
- Wear patterns can easily be picked up
- Graph – shows why panels were changed
 - 412 changed – Normal wear
 - 342 – Aperture change
 - 18 – Test panels
 - 8 – Screen failure



Weeks since last installation



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Screen Ref. # 3121-SCB-01T

Designation : SCRUBBER TOP DECK

Module : 1

Weeks Installed Since Last Panel Changes, Any Item No.

	A	B	C	D	E	F	G	H	I	J	K	L
1	52	35	35	52	52	35	35	68	66	53	53	0
2	28	28	28	28	24	24	26	26	26	26	35	35
3	39	39	26	24	24	24	24	39	39	39	39	39
4	40	40	0	1	0	0	40	0	40	40	40	40
5	40	40	40	40	22	24	40	40	40	40	40	40
6	40	40	40	40	26	40	1	40	40	40	40	40
7	40	40	40	22	22	40	24	40	40	40	40	40
8	40	40	40	22	0	0	26	40	40	40	40	40
9	40	40	22	22	22	22	26	22	26	40	40	40
10	40	40	0	40	40	26	40	40	40	40	40	40
11	40	40	40	40	24	1	40	1	1	40	40	40
12	40	40	40	40	34	24	1	1	40	40	40	40
13	40	40	1	22	1	40	1	2	40	40	40	40
14	40	40	0	0	2	2	1	40	40	40	40	40
15	40	34	40	40	40	40	40	40	40	40	40	40
16	40	40	40	22	20	40	22	40	40	40	40	40
17	40	40	40	22	20	22	1	20	20	40	40	40
18	40	40	40	40	40	40	40	40	40	40	40	40

- Colour-coding indicates the weeks since the last installation
 - Dark-green – 2 and less
 - Pink – 60 and more
- Can predict which panels will fail next





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Average life of a specific panel

Screen Ref. # 3121-SCB-01T
Designation : SCRUBBER TOP DECK
Module : 1

Average Weeks Between Panel Changes, Any Item No, For T

	A	B	C	D	E	F	G	H	I	J	K	L
1	4	4	4	11	0	16	18	0	0	13	0	0
2	5	5	4	4	5	5	12	14	27	27	0	0
3	9	4	7	10	9	15	15	0	13	0	13	0
4	11	16	31	32	28	23	29	39	0	0	0	0
5	5	12	0	22	13	16	0	26	0	0	29	0
6	14	0	13	9	14	11	18	0	28	0	0	0
7	16	23	26	16	23	13	16	12	22	0	0	0
8	9	16	32	12	18	20	14	0	13	29	0	0
9	9	11	21	21	9	12	10	12	10	0	0	0
10	7	28	39	13	9	14	0	0	29	0	0	0
11	7	32	13	11	16	19	0	27	38	0	0	0
12	13	22	13	16	14	16	20	18	0	0	0	0
13	16	32	11	25	15	8	19	37	0	0	0	0
14	11	32	39	18	19	24	38	11	0	0	0	0
15	7	13	0	11	22	0	0	22	0	0	0	0
16	0	16	0	17	12	16	17	0	0	0	0	0
17	16	11	0	17	10	15	38	19	19	0	0	22
18	0	0	0	10	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0

- Colour-coding indicates the average life of a panel
 - Red – 15 weeks and less
 - Green – 36 and more
 - Grey – never changed since date zero
- High wear areas can be identified and planned for
- Information will be more accurate the longer one uses the system



Reason for panel replacement



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De Beers - Kimberley Mine Panel History

08/09/2006 12:20

For The Period 01/06/2005 - 08/09/2006

Filter = ,CTP, CTP - Blue Area

Total

Code	Description	Count
NW	NORMAL WEAR	5463
SF	SCREEN FAILURE (BEAMS ,STRINGERS,I	786
PT	PANEL TYPE CHANGED	755
AC	APERTURE CHANGE	749
NS	NEW SCREEN	136
HO	HOLES OVERSIZE	111
TP	TEST PANEL	66
NEW	NEW	45
BA	BACTERIAL ATTACK	27

Expected remaining service



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Screen Ref. # 3121-SCB-01T

Designation : SCRUBBER TOP DECK

Module : 1

Expected Remaining Weeks for Panel, Any Item No, Fo

	A	B	C	D	E	F	G	H	I	J	K	L
1	-48	-31	-31	-40	0	-19	-17	0	0	-40	0	0
2	-23	-23	-24	-24	-19	-19	-14	-12	1	1	0	0
3	-31	-36	-19	-14	-14	-9	-9	0	-27	0	-27	0
4	-29	-24	31	31	27	22	-11	39	0	0	0	0
5	-35	-28	0	-18	-8	-8	0	-14	0	0	-11	0
6	-26	0	-27	-31	-12	-29	17	0	-12	0	0	0
7	-24	-16	-14	-6	2	-27	-8	-28	-18	0	0	0
8	-31	-24	-8	-9	17	19	-12	0	-27	-11	0	0
9	-30	-29	-1	-1	-13	-10	-16	-10	-16	0	0	0
10	-33	-12	39	-27	-30	-12	0	0	-11	0	0	0
11	-32	-8	-27	-29	-8	18	0	26	37	0	0	0
12	-27	-18	-27	-24	-20	-8	19	17	0	0	0	0
13	-24	-8	9	3	13	-32	18	35	0	0	0	0
14	-29	-8	39	18	16	21	37	-29	0	0	0	0
15	-32	-21	0	-29	-18	0	0	-18	0	0	0	0
16	0	-24	0	-5	-9	-24	-5	0	0	0	0	0
17	-24	-29	0	-5	-10	-7	37	-1	-1	0	0	-18
18	0	0	0	-36	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0

- The colour-coding indicates the expected life that the panel has left
 - Light-green – 36 and more
 - Yellow – 10 and less
- Negative figures – panel has not been changed on its due date
 - Red – 33 and more weeks over the due date
 - Highest probability of failure





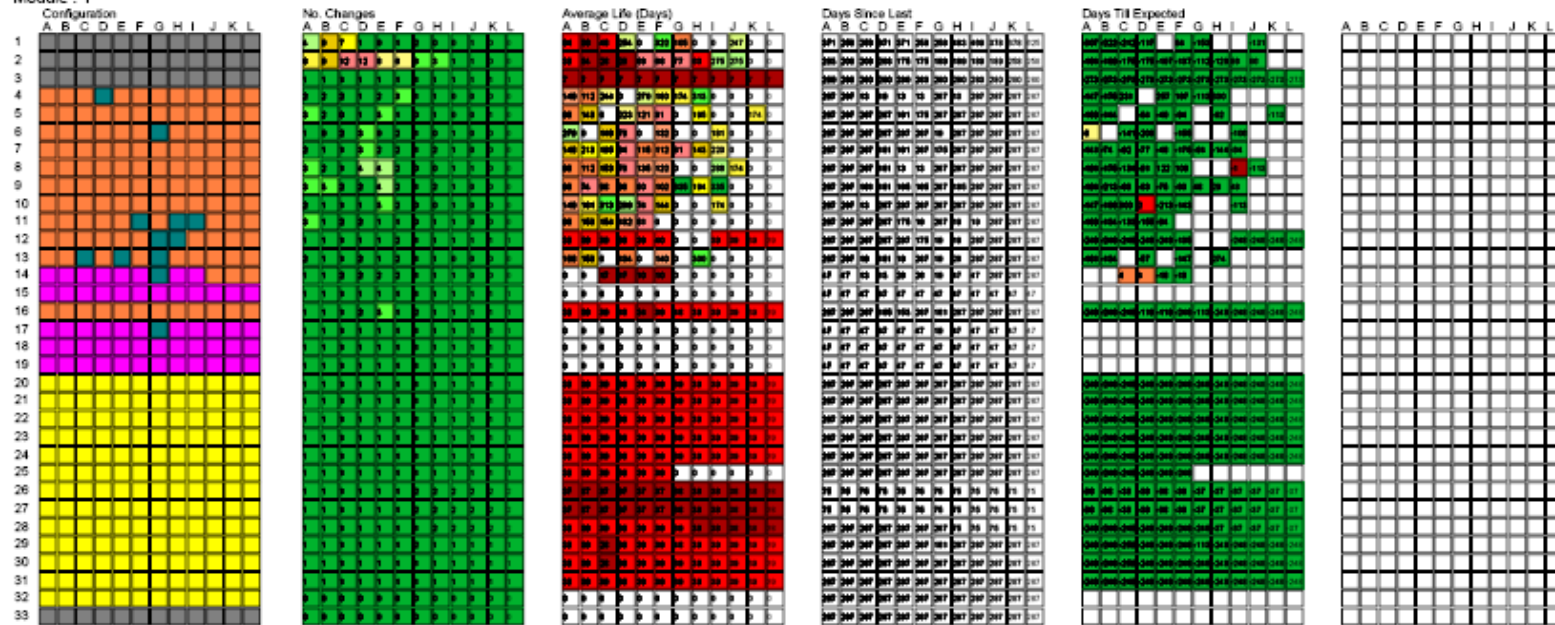
MULTOTEC

Composite report

Customer : De Beers - Kimberley Mine
 Plant : COMBINED TREATMENT PLANT
 Section : CTP - Blue Area
 Screen Ref : 3121-SCB-01T
 Designation : SCRUBBER TOP DECK
 Module : 1

Multotec Hawkeye

Panel Grid Width : 12
 Panel Grid Length : 33



Item #	Description 1	Description 2	Search Text	Qty
121587	305X305X30/24X24	T1H 7X7	MD Panel Rubber	0
125485	305X305X40/SOLID	T2H	MD Panel Rubber	48
151603	305X305X30/24X24	T1H VIBRAPLAST	MD Panel Rubber	0
152636	305x305x30/22x22	T1H TDS	MD Rubber Panel	12
590000	305X305X30/27X27	T1	Rubber	125
590001	305X305X30/27X27	T1 50mm WEIRBAR	Rubber	0
590004	305x305x30/27x27	T1	Rubber	0
590005	305x305x30/22x22	T1	Rubber	158





Typical Contracts



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- Plant will provide panels and Multotec will monitor for first year
- There will be a fixed portion and a variable portion
- Fixed = Labor, transport, office etc.
- Variable = Mine pays for each ton processed (cents/t)
- Also based on KRA's, e.g. screening efficiency, moistures etc.
- Contacts can vary from 1 to 3 year periods





Optimization?



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- The major advantage is that parts or products can be replaced based on accurate and detailed information history. A saving has been reported by a client of R680 000 in their first year.
- Hawkeye has proven that the process is streamlined and that this program facilitates product optimization
- Ensures reduced down time





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Thank You!

