



Tabel 1: Ketersediaan Mesin Tubing T3

Production Line **T3** Table: Availability  
 Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted Bag								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
3	2ply-50kg	1,440	0	1,440	0	1,440	44	1,396	96.9%
4	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
5	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
6	2ply-50kg	1,440	0	1,440	0	1,440	55	1,385	96.2%
7	2ply-50kg	1,440	0	1,440	0	1,440	38	1,402	97.4%
8	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
9	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
10	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
11	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
12	2ply-50kg	1,440	0	1,440	0	1,440	40	1,400	97.2%
13	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
14	2ply-50kg	1,440	0	1,440	0	1,440	64	1,376	95.6%
15	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
16	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
17	2ply-50kg	1,440	0	1,440	480	960	0	960	66.7%
18	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
19	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
20	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
21	2ply-50kg	1,440	0	1,440	0	1,440	32	1,408	97.8%
22	2ply-50kg	1,440	0	1,440	0	1,440	58	1,382	96.0%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
26	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
27	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	34	1,406	97.6%
29	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>365</b>	<b>36,595</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>14</b>	<b>1,408</b>	<b>97.7%</b>

Tabel 2: Kinerja Mesin Tubing T3

**Production Line** T3 **Table: Performance**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Available Hours	Production Rates		Performance
				Target	Actual	
				(pc/min) (f)	(pc/min) (g=e/d)	
	Pasted					
1	Off					
2	2ply-50kg	175,599	1,440	143	121.94	85.3%
3	2ply-50kg	159,538	1,396	143	114.28	79.9%
4	2ply-50kg	156,453	1,440	143	108.65	76.0%
5	2ply-50kg	176,686	1,440	143	122.70	85.8%
6	2ply-50kg	160,642	1,385	143	115.99	81.1%
7	2ply-50kg	167,770	1,402	143	119.66	83.7%
8	2ply-50kg	155,984	1,440	143	108.32	75.7%
9	2ply-50kg	172,605	1,440	143	119.86	83.8%
10	2ply-50kg	176,695	1,440	143	122.70	85.8%
11	2ply-50kg	168,654	1,440	143	117.12	81.9%
12	2ply-50kg	173,674	1,400	143	124.05	86.8%
13	2ply-50kg	171,766	1,440	143	119.28	83.4%
14	2ply-50kg	168,281	1,376	143	122.30	85.5%
15	2ply-50kg	124,487	1,440	143	86.45	60.5%
16	2ply-50kg	140,546	1,440	143	97.60	68.3%
17	2ply-50kg	44,376	960	143	46.23	32.3%
18	2ply-50kg	148,459	1,440	143	103.10	72.1%
19	2ply-50kg	168,697	1,440	143	117.15	81.9%
20	2ply-50kg	176,911	1,440	143	122.85	85.9%
21	2ply-50kg	140,640	1,408	143	99.89	69.9%
22	2ply-50kg	144,821	1,382	143	104.79	73.3%
23	Off					
24	Off					
25	2ply-50kg	164,463	1,440	143	114.21	79.9%
26	2ply-50kg	176,792	1,440	143	122.77	85.9%
27	2ply-50kg	136,537	1,440	143	94.82	66.3%
28	2ply-50kg	112,434	1,406	143	79.97	55.9%
29	2ply-50kg	115,527	1,440	143	80.23	56.1%
30	Off					
31	Off					
<b>Total</b>		<b>3,979,037</b>	<b>36,595</b>	<b>3,718</b>	<b>2,806.92</b>	
<b>Average</b>		<b>153,040</b>	<b>1,408</b>	<b>143</b>	<b>107.96</b>	<b>75.5%</b>

Tabel 3: Kualitas Mesin Tubing T3

**Production Line** T3 **Table: Quality**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	175,599	471	99.7%
3	2ply-50kg	159,538	281	99.8%
4	2ply-50kg	156,453	224	99.9%
5	2ply-50kg	176,686	400	99.8%
6	2ply-50kg	160,642	343	99.8%
7	2ply-50kg	167,770	557	99.7%
8	2ply-50kg	155,984	181	99.9%
9	2ply-50kg	172,605	266	99.8%
10	2ply-50kg	176,695	269	99.8%
11	2ply-50kg	168,654	249	99.9%
12	2ply-50kg	173,674	317	99.8%
13	2ply-50kg	171,766	292	99.8%
14	2ply-50kg	168,281	433	99.7%
15	2ply-50kg	124,487	465	99.6%
16	2ply-50kg	140,546	462	99.7%
17	2ply-50kg	44,376	179	99.6%
18	2ply-50kg	148,459	235	99.8%
19	2ply-50kg	168,697	256	99.8%
20	2ply-50kg	176,911	348	99.8%
21	2ply-50kg	140,640	521	99.6%
22	2ply-50kg	144,821	362	99.8%
23	Off			
24	Off			
25	2ply-50kg	164,463	389	99.8%
26	2ply-50kg	176,792	268	99.8%
27	2ply-50kg	136,537	403	99.7%
28	2ply-50kg	112,434	875	99.2%
29	2ply-50kg	115,527	294	99.7%
30	Off			
31	Off			
<b>Total</b>		<b>3,979,037</b>	<b>9,340</b>	
<b>Average</b>		<b>153,040</b>	<b>359</b>	<b>99.8%</b>

Tabel 4: OEE Mesin Tubing T3

Production Line **T3** Table: OEE  
Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	100.0%	85.3%	99.7%	85.0%
3	2ply-50kg	100.0%	96.9%	79.9%	99.8%	77.3%
4	2ply-50kg	100.0%	100.0%	76.0%	99.9%	75.9%
5	2ply-50kg	100.0%	100.0%	85.8%	99.8%	85.6%
6	2ply-50kg	100.0%	96.2%	81.1%	99.8%	77.8%
7	2ply-50kg	100.0%	97.4%	83.7%	99.7%	81.2%
8	2ply-50kg	100.0%	100.0%	75.7%	99.9%	75.7%
9	2ply-50kg	100.0%	100.0%	83.8%	99.8%	83.7%
10	2ply-50kg	100.0%	100.0%	85.8%	99.8%	85.7%
11	2ply-50kg	100.0%	100.0%	81.9%	99.9%	81.8%
12	2ply-50kg	100.0%	97.2%	86.8%	99.8%	84.2%
13	2ply-50kg	100.0%	100.0%	83.4%	99.8%	83.3%
14	2ply-50kg	100.0%	95.6%	85.5%	99.7%	81.5%
15	2ply-50kg	100.0%	100.0%	60.5%	99.6%	60.2%
16	2ply-50kg	100.0%	100.0%	68.3%	99.7%	68.0%
17	2ply-50kg	100.0%	66.7%	32.3%	99.6%	21.5%
18	2ply-50kg	100.0%	100.0%	72.1%	99.8%	72.0%
19	2ply-50kg	100.0%	100.0%	81.9%	99.8%	81.8%
20	2ply-50kg	100.0%	100.0%	85.9%	99.8%	85.7%
21	2ply-50kg	100.0%	97.8%	69.9%	99.6%	68.0%
22	2ply-50kg	100.0%	96.0%	73.3%	99.8%	70.2%
23	Off					
24	Off					
25	2ply-50kg	100.0%	100.0%	79.9%	99.8%	79.7%
26	2ply-50kg	100.0%	100.0%	85.9%	99.8%	85.7%
27	2ply-50kg	100.0%	100.0%	66.3%	99.7%	66.1%
28	2ply-50kg	100.0%	97.6%	55.9%	99.2%	54.2%
29	2ply-50kg	100.0%	100.0%	56.1%	99.7%	56.0%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>97.7%</b>	<b>75.5%</b>	<b>99.8%</b>	<b>74.1%</b>

Tabel 5: Kerugian Mesin Tubing T3

Production Line **T3** Table: Losses  
Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Total Tubes Produced	Speed Losses		Defects			
			Idling & Minor Stoppages	Reduced Speed	Rework		Reject	
			(min)	(min)	(pc)	(%)	(pc)	(%)
			(i)	(j)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	175,599	0	0	0	0.0%	471	0.268%
3	2ply-50kg	159,538	0	0	0	0.0%	281	0.176%
4	2ply-50kg	156,453	0	0	0	0.0%	224	0.143%
5	2ply-50kg	176,686	0	0	0	0.0%	400	0.226%
6	2ply-50kg	160,642	0	0	0	0.0%	343	0.214%
7	2ply-50kg	167,770	0	0	0	0.0%	557	0.332%
8	2ply-50kg	155,984	0	0	0	0.0%	181	0.116%
9	2ply-50kg	172,605	0	0	0	0.0%	266	0.154%
10	2ply-50kg	176,695	0	0	0	0.0%	269	0.152%
11	2ply-50kg	168,654	0	0	0	0.0%	249	0.148%
12	2ply-50kg	173,674	0	0	0	0.0%	317	0.183%
13	2ply-50kg	171,766	0	0	0	0.0%	292	0.170%
14	2ply-50kg	168,281	0	0	0	0.0%	433	0.257%
15	2ply-50kg	124,487	0	0	0	0.0%	465	0.374%
16	2ply-50kg	140,546	0	0	0	0.0%	462	0.329%
17	2ply-50kg	44,376	0	0	0	0.0%	179	0.403%
18	2ply-50kg	148,459	0	0	0	0.0%	235	0.158%
19	2ply-50kg	168,697	0	0	0	0.0%	256	0.152%
20	2ply-50kg	176,911	0	0	0	0.0%	348	0.197%
21	2ply-50kg	140,640	0	0	0	0.0%	521	0.370%
22	2ply-50kg	144,821	0	0	0	0.0%	362	0.250%
23	Off							
24	Off							
25	2ply-50kg	164,463	0	0	0	0.0%	389	0.237%
26	2ply-50kg	176,792	0	0	0	0.0%	268	0.152%
27	2ply-50kg	136,537	0	0	0	0.0%	403	0.295%
28	2ply-50kg	112,434	0	0	0	0.0%	875	0.778%
29	2ply-50kg	115,527	0	0	0	0.0%	294	0.254%
30	Off							
31	Off							
<b>Total</b>		<b>3,979,037</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>9,340</b>	
<b>Average</b>		<b>153,040</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>359</b>	<b>0.250%</b>

Tabel 6: Ketersediaan Mesin Bottomer T3

Production Line		T3		Table: Availability					
Bottomer 712B		Month/Year: Jan-10							
Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440	132	1,308	90.8%
3	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
4	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
5	2ply-50kg	1,440	0	1,440	0	1,440	97	1,343	93.3%
6	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
7	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
8	2ply-50kg	1,440	0	1,440	0	1,440	55	1,385	96.2%
9	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
10	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
11	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
12	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
13	2ply-50kg	1,440	0	1,440	0	1,440	85	1,355	94.1%
14	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
15	2ply-50kg	1,440	0	1,440	0	1,440	121	1,319	91.6%
16	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
17	2ply-50kg	1,440	0	1,440	480	960	0	960	66.7%
18	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
19	2ply-50kg	1,440	0	1,440	0	1,440	234	1,206	83.8%
20	2ply-50kg	1,440	0	1,440	0	1,440	157	1,283	89.1%
21	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
22	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
26	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
27	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
29	2ply-50kg	1,440	0	1,440	0	1,440	63	1,377	95.6%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>944</b>	<b>36,016</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>36</b>	<b>1,385</b>	<b>96.2%</b>

Tabel 7: Kinerja Mesin Bottomer T3

**Production Line** T3 **Table: Performance**  
**Bottomer 712B** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Bags Produced (pc) (e)	Available Hours (min) (d)	Production Rates		Performance (%) (P=g/f)
				Target (pc/min) (f)	Actual (pc/min) (g=e/d)	
					Pasted	
1	Off					
2	2ply-50kg	176,000	1,308	143	135	94.1%
3	2ply-50kg	160,000	1,440	143	111	77.7%
4	2ply-50kg	156,000	1,440	143	108	75.8%
5	2ply-50kg	176,000	1,343	143	131	91.6%
6	2ply-50kg	160,000	1,440	143	111	77.7%
7	2ply-50kg	168,000	1,440	143	117	81.6%
8	2ply-50kg	156,000	1,385	143	113	78.8%
9	2ply-50kg	172,000	1,440	143	119	83.5%
10	2ply-50kg	176,000	1,440	143	122	85.5%
11	2ply-50kg	168,000	1,440	143	117	81.6%
12	2ply-50kg	172,000	1,440	143	119	83.5%
13	2ply-50kg	172,000	1,355	143	127	88.8%
14	2ply-50kg	168,000	1,440	143	117	81.6%
15	2ply-50kg	124,000	1,319	143	94	65.7%
16	2ply-50kg	140,000	1,440	143	97	68.0%
17	2ply-50kg	44,000	960	143	46	32.1%
18	2ply-50kg	148,000	1,440	143	103	71.9%
19	2ply-50kg	168,000	1,206	143	139	97.4%
20	2ply-50kg	176,000	1,283	143	137	95.9%
21	2ply-50kg	140,000	1,440	143	97	68.0%
22	2ply-50kg	144,000	1,440	143	100	69.9%
23	Off					
24	Off					
25	2ply-50kg	164,000	1,440	143	114	79.6%
26	2ply-50kg	176,000	1,440	143	122	85.5%
27	2ply-50kg	136,000	1,440	143	94	66.0%
28	2ply-50kg	112,000	1,440	143	78	54.4%
29	2ply-50kg	116,000	1,377	143	84	58.9%
30	Off					
31	Off					
<b>Total</b>		<b>3,968,000</b>	<b>36,016</b>	<b>3,718</b>	<b>2,853</b>	
<b>Average</b>		<b>152,615</b>	<b>1,385</b>	<b>143</b>	<b>110</b>	<b>76.7%</b>



Tabel 8: Kualitas Mesin Bottomer T3

**Production Line** T3 **Table: Quality**  
**Bottomer 712B** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Bags Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	176,000	638	99.6%
3	2ply-50kg	160,000	586	99.6%
4	2ply-50kg	156,000	584	99.6%
5	2ply-50kg	176,000	685	99.6%
6	2ply-50kg	160,000	620	99.6%
7	2ply-50kg	168,000	645	99.6%
8	2ply-50kg	156,000	611	99.6%
9	2ply-50kg	172,000	687	99.6%
10	2ply-50kg	176,000	675	99.6%
11	2ply-50kg	168,000	654	99.6%
12	2ply-50kg	172,000	664	99.6%
13	2ply-50kg	172,000	668	99.6%
14	2ply-50kg	168,000	642	99.6%
15	2ply-50kg	124,000	482	99.6%
16	2ply-50kg	140,000	546	99.6%
17	2ply-50kg	44,000	172	99.6%
18	2ply-50kg	148,000	541	99.6%
19	2ply-50kg	168,000	630	99.6%
20	2ply-50kg	176,000	633	99.6%
21	2ply-50kg	140,000	524	99.6%
22	2ply-50kg	144,000	539	99.6%
23	Off			
24	Off			
25	2ply-50kg	164,000	627	99.6%
26	2ply-50kg	176,000	675	99.6%
27	2ply-50kg	136,000	537	99.6%
28	2ply-50kg	112,000	434	99.6%
29	2ply-50kg	116,000	455	99.6%
30	Off			
31	Off			
<b>Total</b>		<b>3,968,000</b>	<b>15,154</b>	
<b>Average</b>		<b>152,615</b>	<b>583</b>	<b>99.6%</b>

Tabel 9: OEE Mesin Bottomer T3

Production Line **T3** Table: OEE  
 Bottomer **712B** Month/Year: Jan-10

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	90.8%	94.1%	99.6%	85.2%
3	2ply-50kg	100.0%	100.0%	77.7%	99.6%	77.4%
4	2ply-50kg	100.0%	100.0%	75.8%	99.6%	75.5%
5	2ply-50kg	100.0%	93.3%	91.6%	99.6%	85.1%
6	2ply-50kg	100.0%	100.0%	77.7%	99.6%	77.4%
7	2ply-50kg	100.0%	100.0%	81.6%	99.6%	81.3%
8	2ply-50kg	100.0%	96.2%	78.8%	99.6%	75.5%
9	2ply-50kg	100.0%	100.0%	83.5%	99.6%	83.2%
10	2ply-50kg	100.0%	100.0%	85.5%	99.6%	85.1%
11	2ply-50kg	100.0%	100.0%	81.6%	99.6%	81.3%
12	2ply-50kg	100.0%	100.0%	83.5%	99.6%	83.2%
13	2ply-50kg	100.0%	94.1%	88.8%	99.6%	83.2%
14	2ply-50kg	100.0%	100.0%	81.6%	99.6%	81.3%
15	2ply-50kg	100.0%	91.6%	65.7%	99.6%	60.0%
16	2ply-50kg	100.0%	100.0%	68.0%	99.6%	67.7%
17	2ply-50kg	100.0%	66.7%	32.1%	99.6%	21.3%
18	2ply-50kg	100.0%	100.0%	71.9%	99.6%	71.6%
19	2ply-50kg	100.0%	83.8%	97.4%	99.6%	81.3%
20	2ply-50kg	100.0%	89.1%	95.9%	99.6%	85.2%
21	2ply-50kg	100.0%	100.0%	68.0%	99.6%	67.7%
22	2ply-50kg	100.0%	100.0%	69.9%	99.6%	69.7%
23	Off					
24	Off					
25	2ply-50kg	100.0%	100.0%	79.6%	99.6%	79.3%
26	2ply-50kg	100.0%	100.0%	85.5%	99.6%	85.1%
27	2ply-50kg	100.0%	100.0%	66.0%	99.6%	65.8%
28	2ply-50kg	100.0%	100.0%	54.4%	99.6%	54.2%
29	2ply-50kg	100.0%	95.6%	58.9%	99.6%	56.1%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>96.2%</b>	<b>76.7%</b>	<b>99.6%</b>	<b>73.8%</b>

Tabel 10: Kerugian Mesin Bottomer T3

Production Line **T3** Table: Losses  
**Bottomer 712B** Month/Year: Jan-10

Date	Type of Bag Produced	Total Bags Produced	Speed Losses		Defects			
			Idling & Minor Stoppages	Reduced Speed	Rework		Reject	
			(pc)	(min)	(pc)	(%)	(pc)	(%)
			(e)	(i)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	176,000	0	0	0	0.0%	638	0.363%
3	2ply-50kg	160,000	0	0	0	0.0%	586	0.366%
4	2ply-50kg	156,000	0	0	0	0.0%	584	0.374%
5	2ply-50kg	176,000	0	0	0	0.0%	685	0.389%
6	2ply-50kg	160,000	0	0	0	0.0%	620	0.388%
7	2ply-50kg	168,000	0	0	0	0.0%	645	0.384%
8	2ply-50kg	156,000	0	0	0	0.0%	611	0.392%
9	2ply-50kg	172,000	0	0	0	0.0%	687	0.399%
10	2ply-50kg	176,000	0	0	0	0.0%	675	0.384%
11	2ply-50kg	168,000	0	0	0	0.0%	654	0.389%
12	2ply-50kg	172,000	0	0	0	0.0%	664	0.386%
13	2ply-50kg	172,000	0	0	0	0.0%	668	0.388%
14	2ply-50kg	168,000	0	0	0	0.0%	642	0.382%
15	2ply-50kg	124,000	0	0	0	0.0%	482	0.389%
16	2ply-50kg	140,000	0	0	0	0.0%	546	0.390%
17	2ply-50kg	44,000	0	0	0	0.0%	172	0.391%
18	2ply-50kg	148,000	0	0	0	0.0%	541	0.366%
19	2ply-50kg	168,000	0	0	0	0.0%	630	0.375%
20	2ply-50kg	176,000	0	0	0	0.0%	633	0.360%
21	2ply-50kg	140,000	0	0	0	0.0%	524	0.374%
22	2ply-50kg	144,000	0	0	0	0.0%	539	0.374%
23	Off							
24	Off							
25	2ply-50kg	164,000	0	0	0	0.0%	627	0.382%
26	2ply-50kg	176,000	0	0	0	0.0%	675	0.384%
27	2ply-50kg	136,000	0	0	0	0.0%	537	0.395%
28	2ply-50kg	112,000	0	0	0	0.0%	434	0.388%
29	2ply-50kg	116,000	0	0	0	0.0%	455	0.392%
30	Off							
31	Off							
<b>Total</b>		<b>3,968,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>15,154</b>	
<b>Average</b>		<b>152,615</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>583</b>	<b>0.382%</b>

Tabel 11: Ketersediaan Mesin Tubing T4

Production Line		T4		Table: Availability					
Tubing Machine 12M		Month/Year: Jan-10							
Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted Bag								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
3	2ply-50kg	1,440	0	1,440	0	1,440	70	1,370	95.1%
4	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
5	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
6	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
7	2ply-50kg	1,440	0	1,440	0	1,440	25	1,415	98.3%
8	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
9	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
10	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
11	2ply-50kg	1,440	0	1,440	480	960	0	960	66.7%
12	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
13	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
14	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
15	2ply-50kg	1,440	0	1,440	0	1,440	30	1,410	97.9%
16	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
17	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
18	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
19	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
20	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
21	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
22	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
26	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
27	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
29	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>125</b>	<b>36,835</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>5</b>	<b>1,417</b>	<b>98.4%</b>

Tabel 12: Kinerja Mesin Tubing T4

**Production Line** T4 **Table: Performance**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Available Hours	Production Rates		Performance
				Target	Actual	
				(pc/min) (f)	(pc/min) (g=e/d)	
	Pasted					
1	Off					
2	2ply-50kg	151,005	1,440	143	104.86	73.3%
3	2ply-50kg	139,734	1,370	143	102.00	71.3%
4	2ply-50kg	179,346	1,440	143	124.55	87.1%
5	2ply-50kg	170,300	1,440	143	118.26	82.7%
6	2ply-50kg	175,298	1,440	143	121.73	85.1%
7	2ply-50kg	163,916	1,415	143	115.84	81.0%
8	2ply-50kg	163,406	1,440	143	113.48	79.4%
9	2ply-50kg	167,140	1,440	143	116.07	81.2%
10	2ply-50kg	179,235	1,440	143	124.47	87.0%
11	2ply-50kg	113,859	960	143	118.60	82.9%
12	2ply-50kg	175,181	1,440	143	121.65	85.1%
13	2ply-50kg	183,321	1,440	143	127.31	89.0%
14	2ply-50kg	179,624	1,440	143	124.74	87.2%
15	2ply-50kg	158,885	1,410	143	112.68	78.8%
16	2ply-50kg	179,246	1,440	143	124.48	87.0%
17	2ply-50kg	52,756	1,440	143	36.64	25.6%
18	2ply-50kg	158,935	1,440	143	110.37	77.2%
19	2ply-50kg	166,936	1,440	143	115.93	81.1%
20	2ply-50kg	182,616	1,440	143	126.82	88.7%
21	2ply-50kg	179,508	1,440	143	124.66	87.2%
22	2ply-50kg	167,522	1,440	143	116.33	81.4%
23	Off					
24	Off					
25	2ply-50kg	175,349	1,440	143	121.77	85.2%
26	2ply-50kg	167,398	1,440	143	116.25	81.3%
27	2ply-50kg	174,776	1,440	143	121.37	84.9%
28	2ply-50kg	175,239	1,440	143	121.69	85.1%
29	2ply-50kg	154,232	1,440	143	107.11	74.9%
30	Off					
31	Off					
<b>Total</b>		<b>4,234,764</b>	<b>36,835</b>	<b>3,718</b>	<b>2,989.66</b>	
<b>Average</b>		<b>162,876</b>	<b>1,417</b>	<b>143</b>	<b>114.99</b>	<b>80.4%</b>

Tabel 13: Kualitas Mesin Tubing T4

**Production Line** T4 **Table: Quality**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	151,005	275	99.8%
3	2ply-50kg	139,734	257	99.8%
4	2ply-50kg	179,346	256	99.9%
5	2ply-50kg	170,300	295	99.8%
6	2ply-50kg	175,298	308	99.8%
7	2ply-50kg	163,916	377	99.8%
8	2ply-50kg	163,406	253	99.8%
9	2ply-50kg	167,140	285	99.8%
10	2ply-50kg	179,235	367	99.8%
11	2ply-50kg	113,859	270	99.8%
12	2ply-50kg	175,181	277	99.8%
13	2ply-50kg	183,321	282	99.8%
14	2ply-50kg	179,624	309	99.8%
15	2ply-50kg	158,885	262	99.8%
16	2ply-50kg	179,246	310	99.8%
17	2ply-50kg	52,756	96	99.8%
18	2ply-50kg	158,935	279	99.8%
19	2ply-50kg	166,936	260	99.8%
20	2ply-50kg	182,616	297	99.8%
21	2ply-50kg	179,508	325	99.8%
22	2ply-50kg	167,522	284	99.8%
23	Off			
24	Off			
25	2ply-50kg	175,349	289	99.8%
26	2ply-50kg	167,398	293	99.8%
27	2ply-50kg	174,776	325	99.8%
28	2ply-50kg	175,239	286	99.8%
29	2ply-50kg	154,232	253	99.8%
30	Off			
31	Off			
<b>Total</b>		<b>4,234,764</b>	<b>7,368</b>	
<b>Average</b>		<b>162,876</b>	<b>283</b>	<b>99.8%</b>

Tabel 14: OEE Mesin Tubing T4

Production Line **T4** Table: OEE  
Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	100.0%	73.3%	99.8%	73.2%
3	2ply-50kg	100.0%	95.1%	71.3%	99.8%	67.7%
4	2ply-50kg	100.0%	100.0%	87.1%	99.9%	87.0%
5	2ply-50kg	100.0%	100.0%	82.7%	99.8%	82.6%
6	2ply-50kg	100.0%	100.0%	85.1%	99.8%	85.0%
7	2ply-50kg	100.0%	98.3%	81.0%	99.8%	79.4%
8	2ply-50kg	100.0%	100.0%	79.4%	99.8%	79.2%
9	2ply-50kg	100.0%	100.0%	81.2%	99.8%	81.0%
10	2ply-50kg	100.0%	100.0%	87.0%	99.8%	86.9%
11	2ply-50kg	100.0%	66.7%	82.9%	99.8%	55.2%
12	2ply-50kg	100.0%	100.0%	85.1%	99.8%	84.9%
13	2ply-50kg	100.0%	100.0%	89.0%	99.8%	88.9%
14	2ply-50kg	100.0%	100.0%	87.2%	99.8%	87.1%
15	2ply-50kg	100.0%	97.9%	78.8%	99.8%	77.0%
16	2ply-50kg	100.0%	100.0%	87.0%	99.8%	86.9%
17	2ply-50kg	100.0%	100.0%	25.6%	99.8%	25.6%
18	2ply-50kg	100.0%	100.0%	77.2%	99.8%	77.0%
19	2ply-50kg	100.0%	100.0%	81.1%	99.8%	80.9%
20	2ply-50kg	100.0%	100.0%	88.7%	99.8%	88.5%
21	2ply-50kg	100.0%	100.0%	87.2%	99.8%	87.0%
22	2ply-50kg	100.0%	100.0%	81.4%	99.8%	81.2%
23	Off					
24	Off					
25	2ply-50kg	100.0%	100.0%	85.2%	99.8%	85.0%
26	2ply-50kg	100.0%	100.0%	81.3%	99.8%	81.2%
27	2ply-50kg	100.0%	100.0%	84.9%	99.8%	84.7%
28	2ply-50kg	100.0%	100.0%	85.1%	99.8%	85.0%
29	2ply-50kg	100.0%	100.0%	74.9%	99.8%	74.8%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>98.4%</b>	<b>80.4%</b>	<b>99.8%</b>	<b>79.0%</b>

Tabel 15: Kerugian Mesin Tubing T4

Production Line **T4** Table: Losses  
Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Total Tubes Produced	Startup & Minor Stops		Defects			
			Set-up & Adjustments	Idling & Minor Stoppages	Rework		Reject	
			(min)	(min)	(pc)	(%)	(pc)	(%)
			(e)	(j)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	151,005	0	0	0	0.0%	275	0.182%
3	2ply-50kg	139,734	0	0	0	0.0%	257	0.184%
4	2ply-50kg	179,346	0	0	0	0.0%	256	0.143%
5	2ply-50kg	170,300	0	0	0	0.0%	295	0.173%
6	2ply-50kg	175,298	0	0	0	0.0%	308	0.176%
7	2ply-50kg	163,916	0	0	0	0.0%	377	0.230%
8	2ply-50kg	163,406	0	0	0	0.0%	253	0.155%
9	2ply-50kg	167,140	0	0	0	0.0%	285	0.171%
10	2ply-50kg	179,235	0	0	0	0.0%	367	0.205%
11	2ply-50kg	113,859	0	0	0	0.0%	270	0.237%
12	2ply-50kg	175,181	0	0	0	0.0%	277	0.158%
13	2ply-50kg	183,321	0	0	0	0.0%	282	0.154%
14	2ply-50kg	179,624	0	0	0	0.0%	309	0.172%
15	2ply-50kg	158,885	0	0	0	0.0%	262	0.165%
16	2ply-50kg	179,246	0	0	0	0.0%	310	0.173%
17	2ply-50kg	52,756	0	0	0	0.0%	96	0.182%
18	2ply-50kg	158,935	0	0	0	0.0%	279	0.175%
19	2ply-50kg	166,936	0	0	0	0.0%	260	0.156%
20	2ply-50kg	182,616	0	0	0	0.0%	297	0.163%
21	2ply-50kg	179,508	0	0	0	0.0%	325	0.181%
22	2ply-50kg	167,522	0	0	0	0.0%	284	0.170%
23	Off							
24	Off							
25	2ply-50kg	175,349	0	0	0	0.0%	289	0.165%
26	2ply-50kg	167,398	0	0	0	0.0%	293	0.175%
27	2ply-50kg	174,776	0	0	0	0.0%	325	0.186%
28	2ply-50kg	175,239	0	0	0	0.0%	286	0.163%
29	2ply-50kg	154,232	0	0	0	0.0%	253	0.164%
30	Off							
31	Off							
<b>Total</b>		<b>4,234,764</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>7,368</b>	
<b>Average</b>		<b>162,876</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>283</b>	<b>0.175%</b>



Tabel 16: Ketersediaan Mesin Bottomer T4

Production Line		T4		Table: Availability					
Bottomer 712B		Month/Year: Jan-10							
Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440		1,440	100.0%
3	2ply-50kg	1,440	0	1,440	0	1,440	70	1,370	95.1%
4	2ply-50kg	1,440	0	1,440	0	1,440	22	1,418	98.5%
5	2ply-50kg	1,440	0	1,440	0	1,440	40	1,400	97.2%
6	2ply-50kg	1,440	0	1,440	0	1,440	23	1,417	98.4%
7	2ply-50kg	1,440	0	1,440	0	1,440	24	1,416	98.3%
8	2ply-50kg	1,440	0	1,440	0	1,440	112	1,328	92.2%
9	2ply-50kg	1,440	0	1,440	0	1,440	113	1,327	92.2%
10	2ply-50kg	1,440	0	1,440	0	1,440	21	1,419	98.5%
11	2ply-50kg	1,440	0	1,440	480	960	18	942	65.4%
12	2ply-50kg	1,440	0	1,440	0	1,440	30	1,410	97.9%
13	2ply-50kg	1,440	0	1,440	0	1,440	26	1,414	98.2%
14	2ply-50kg	1,440	0	1,440	0	1,440	26	1,414	98.2%
15	2ply-50kg	1,440	0	1,440	0	1,440	24	1,416	98.3%
16	2ply-50kg	1,440	0	1,440	0	1,440	28	1,412	98.1%
17	2ply-50kg	1,440	0	1,440	0	1,440	54	1,386	96.3%
18	2ply-50kg	1,440	0	1,440	0	1,440	27	1,413	98.1%
19	2ply-50kg	1,440	0	1,440	0	1,440	29	1,411	98.0%
20	2ply-50kg	1,440	0	1,440	0	1,440	19	1,421	98.7%
21	2ply-50kg	1,440	0	1,440	0	1,440	25	1,415	98.3%
22	2ply-50kg	1,440	0	1,440	0	1,440	23	1,417	98.4%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	22	1,418	98.5%
26	2ply-50kg	1,440	0	1,440	0	1,440	60	1,380	95.8%
27	2ply-50kg	1,440	0	1,440	0	1,440	43	1,397	97.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	73	1,367	94.9%
29	2ply-50kg	1,440	0	1,440	0	1,440	32	1,408	97.8%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>984</b>	<b>35,976</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>39</b>	<b>1,384</b>	<b>96.1%</b>

Tabel 17: Kinerja Mesin Bottomer T4

Production Line **T4** Table: Performance  
Bottomer 712B Month/Year: Jan-10

Date	Type of Bag Produced	Total Bags Produced (pc) (e)	Available Hours (min) (d)	Production Rates		Performance (%) (P=g/f)
				Target (pc/min) (f)	Actual (pc/min) (g=e/d)	
	Pasted					
1	Off					
2	2ply-50kg	150,348	1,440	143	104.408508	73.0%
3	2ply-50kg	139,138	1,370	143	101.560383	71.0%
4	2ply-50kg	178,590	1,440	143	124.020681	86.7%
5	2ply-50kg	169,540	1,440	143	117.735962	82.3%
6	2ply-50kg	174,524	1,440	143	121.197435	84.8%
7	2ply-50kg	163,191	1,415	143	115.329519	80.7%
8	2ply-50kg	162,715	1,440	143	112.996705	79.0%
9	2ply-50kg	166,397	1,440	143	115.5538	80.8%
10	2ply-50kg	178,457	1,440	143	123.928665	86.7%
11	2ply-50kg	113,122	960	143	117.835543	82.4%
12	2ply-50kg	174,402	1,440	143	121.112299	84.7%
13	2ply-50kg	182,503	1,440	143	126.738412	88.6%
14	2ply-50kg	178,834	1,440	143	124.190007	86.8%
15	2ply-50kg	158,178	1,410	143	112.183182	78.4%
16	2ply-50kg	178,457	1,440	143	123.928775	86.7%
17	2ply-50kg	52,519	1,440	143	36.4717208	25.5%
18	2ply-50kg	158,261	1,440	143	109.903447	76.9%
19	2ply-50kg	166,222	1,440	143	115.431699	80.7%
20	2ply-50kg	181,832	1,440	143	126.271965	88.3%
21	2ply-50kg	178,751	1,440	143	124.132643	86.8%
22	2ply-50kg	166,812	1,440	143	115.841446	81.0%
23	Off					
24	Off					
25	2ply-50kg	174,599	1,440	143	121.249297	84.8%
26	2ply-50kg	166,643	1,440	143	115.724314	80.9%
27	2ply-50kg	174,000	1,440	143	120.833445	84.5%
28	2ply-50kg	174,435	1,440	143	121.135082	84.7%
29	2ply-50kg	153,530	1,440	143	106.617717	74.6%
30	Off					
31	Off					
<b>Total</b>		<b>4,216,000</b>	<b>36,835</b>	<b>3,718</b>	<b>2,976</b>	
<b>Average</b>		<b>162,154</b>	<b>1,417</b>	<b>143</b>	<b>114</b>	<b>80.1%</b>

Tabel 18: Kualitas Mesin Bottomer T4

Production Line		T4		Table: Quality
		Bottomer 712B		Month/Year: Jan-10
Date	Type of Bag Produced	Total Bags Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	150,348	572	99.6%
3	2ply-50kg	139,138	518	99.6%
4	2ply-50kg	178,590	655	99.6%
5	2ply-50kg	169,540	664	99.6%
6	2ply-50kg	174,524	675	99.6%
7	2ply-50kg	163,191	633	99.6%
8	2ply-50kg	162,715	599	99.6%
9	2ply-50kg	166,397	649	99.6%
10	2ply-50kg	178,457	677	99.6%
11	2ply-50kg	113,122	673	99.4%
12	2ply-50kg	174,402	681	99.6%
13	2ply-50kg	182,503	715	99.6%
14	2ply-50kg	178,834	689	99.6%
15	2ply-50kg	158,178	617	99.6%
16	2ply-50kg	178,457	688	99.6%
17	2ply-50kg	52,519	207	99.6%
18	2ply-50kg	158,261	585	99.6%
19	2ply-50kg	166,222	620	99.6%
20	2ply-50kg	181,832	682	99.6%
21	2ply-50kg	178,751	656	99.6%
22	2ply-50kg	166,812	616	99.6%
23	Off			
24	Off			
25	2ply-50kg	174,599	651	99.6%
26	2ply-50kg	166,643	661	99.6%
27	2ply-50kg	174,000	678	99.6%
28	2ply-50kg	174,435	706	99.6%
29	2ply-50kg	153,530	616	99.6%
30	Off			
31	Off			
<b>Total</b>		<b>4,216,000</b>	<b>16,385</b>	
<b>Average</b>		<b>162,154</b>	<b>630</b>	<b>99.6%</b>

Tabel 19: OEE Mesin Bottomer T4

Production Line **T4** **Table: OEE**  
 Bottomer **712B** Month/Year: **Jan-10**

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	100.0%	73.0%	99.6%	72.7%
3	2ply-50kg	100.0%	95.1%	71.0%	99.6%	67.3%
4	2ply-50kg	100.0%	98.5%	86.7%	99.6%	85.1%
5	2ply-50kg	100.0%	97.2%	82.3%	99.6%	79.7%
6	2ply-50kg	100.0%	98.4%	84.8%	99.6%	83.1%
7	2ply-50kg	100.0%	98.3%	80.7%	99.6%	79.0%
8	2ply-50kg	100.0%	92.2%	79.0%	99.6%	72.6%
9	2ply-50kg	100.0%	92.2%	80.8%	99.6%	74.2%
10	2ply-50kg	100.0%	98.5%	86.7%	99.6%	85.1%
11	2ply-50kg	100.0%	65.4%	82.4%	99.4%	53.6%
12	2ply-50kg	100.0%	97.9%	84.7%	99.6%	82.6%
13	2ply-50kg	100.0%	98.2%	88.6%	99.6%	86.7%
14	2ply-50kg	100.0%	98.2%	86.8%	99.6%	84.9%
15	2ply-50kg	100.0%	98.3%	78.4%	99.6%	76.8%
16	2ply-50kg	100.0%	98.1%	86.7%	99.6%	84.7%
17	2ply-50kg	100.0%	96.3%	25.5%	99.6%	24.5%
18	2ply-50kg	100.0%	98.1%	76.9%	99.6%	75.1%
19	2ply-50kg	100.0%	98.0%	80.7%	99.6%	78.8%
20	2ply-50kg	100.0%	98.7%	88.3%	99.6%	86.8%
21	2ply-50kg	100.0%	98.3%	86.8%	99.6%	85.0%
22	2ply-50kg	100.0%	98.4%	81.0%	99.6%	79.4%
23	Off					
24	Off					
25	2ply-50kg	100.0%	98.5%	84.8%	99.6%	83.2%
26	2ply-50kg	100.0%	95.8%	80.9%	99.6%	77.2%
27	2ply-50kg	100.0%	97.0%	84.5%	99.6%	81.7%
28	2ply-50kg	100.0%	94.9%	84.7%	99.6%	80.1%
29	2ply-50kg	100.0%	97.8%	74.6%	99.6%	72.6%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>96.1%</b>	<b>80.1%</b>	<b>99.6%</b>	<b>76.6%</b>

Tabel 20: Kerugian Mesin Bottomer T4

Production Line **T4**  
Bottomer 712B

**Table: Losses**  
 Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Bags Produced	Startup & Minor Stops		Defects			
			Set-up & Adjustments	Idling & Minor Stoppages	Rework		Reject	
			(min)	(min)	(pc)	(%)	(pc)	(%)
			(i)	(j)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	150,348	0	0	0	0.0%	572	0.380%
3	2ply-50kg	139,138	0	0	0	0.0%	518	0.372%
4	2ply-50kg	178,590	0	0	0	0.0%	655	0.367%
5	2ply-50kg	169,540	0	0	0	0.0%	664	0.392%
6	2ply-50kg	174,524	0	0	0	0.0%	675	0.387%
7	2ply-50kg	163,191	0	0	0	0.0%	633	0.388%
8	2ply-50kg	162,715	0	0	0	0.0%	599	0.368%
9	2ply-50kg	166,397	0	0	0	0.0%	649	0.390%
10	2ply-50kg	178,457	0	0	0	0.0%	677	0.379%
11	2ply-50kg	113,122	0	0	0	0.0%	673	0.595%
12	2ply-50kg	174,402	0	0	0	0.0%	681	0.391%
13	2ply-50kg	182,503	0	0	0	0.0%	715	0.392%
14	2ply-50kg	178,834	0	0	0	0.0%	689	0.385%
15	2ply-50kg	158,178	0	0	0	0.0%	617	0.390%
16	2ply-50kg	178,457	0	0	0	0.0%	688	0.386%
17	2ply-50kg	52,519	0	0	0	0.0%	207	0.394%
18	2ply-50kg	158,261	0	0	0	0.0%	585	0.370%
19	2ply-50kg	166,222	0	0	0	0.0%	620	0.373%
20	2ply-50kg	181,832	0	0	0	0.0%	682	0.375%
21	2ply-50kg	178,751	0	0	0	0.0%	656	0.367%
22	2ply-50kg	166,812	0	0	0	0.0%	616	0.369%
23	Off							
24	Off							
25	2ply-50kg	174,599	0	0	0	0.0%	651	0.373%
26	2ply-50kg	166,643	0	0	0	0.0%	661	0.397%
27	2ply-50kg	174,000	0	0	0	0.0%	678	0.390%
28	2ply-50kg	174,435	0	0	0	0.0%	706	0.405%
29	2ply-50kg	153,530	0	0	0	0.0%	616	0.401%
30	Off							
31	Off							
<b>Total</b>		<b>4,216,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>16,385</b>	
<b>Average</b>		<b>162,154</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>630</b>	<b>0.391%</b>

Tabel 21: Ketersediaan Mesin Tubing T5

Production Line		T5		Table: Availability					
Tubing Machine 12M		Month/Year: Jan-10							
Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted Bag								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440	38	1,402	97.4%
3	2ply-50kg	1,440	0	1,440	0	1,440	42	1,398	97.1%
4	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
5	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
6	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
7	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
8	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
9	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
10	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
11	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
12	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
13	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
14	2ply-50kg	1,440	0	1,440	0	1,440	49	1,391	96.6%
15	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
16	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
17	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
18	2ply-50kg	1,440	0	1,440	480	960	0	960	66.7%
19	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
20	2ply-50kg	1,440	0	1,440	0	1,440	21	1,419	98.5%
21	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
22	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
26	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
27	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	50	1,390	96.5%
29	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>200</b>	<b>36,760</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>8</b>	<b>1,414</b>	<b>98.2%</b>

Tabel 22: Kinerja Mesin Tubing T5

**Production Line** T5 **Table: Performance**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Available Hours	Production Rates		Performance
				Target	Actual	
				(pc/min)	(pc/min)	
				(f)	(g=e/d)	
	Pasted					
1	Off					
2	2ply-50kg	130,290	1,402	143	92.93	65.0%
3	2ply-50kg	140,565	1,398	143	100.55	70.3%
4	2ply-50kg	154,743	1,440	143	107.46	75.1%
5	2ply-50kg	146,938	1,440	143	102.04	71.4%
6	2ply-50kg	151,250	1,440	143	105.03	73.5%
7	2ply-50kg	141,430	1,440	143	98.22	68.7%
8	2ply-50kg	140,990	1,440	143	97.91	68.5%
9	2ply-50kg	144,212	1,440	143	100.15	70.0%
10	2ply-50kg	154,647	1,440	143	107.39	75.1%
11	2ply-50kg	98,240	1,440	143	68.22	47.7%
12	2ply-50kg	151,150	1,440	143	104.97	73.4%
13	2ply-50kg	158,173	1,440	143	109.84	76.8%
14	2ply-50kg	154,983	1,391	143	111.42	77.9%
15	2ply-50kg	137,089	1,440	143	95.20	66.6%
16	2ply-50kg	154,657	1,440	143	107.40	75.1%
17	2ply-50kg	45,519	1,440	143	31.61	22.1%
18	2ply-50kg	98,765	960	143	102.88	71.9%
19	2ply-50kg	144,035	1,440	143	100.02	69.9%
20	2ply-50kg	156,932	1,419	143	110.59	77.3%
21	2ply-50kg	154,883	1,440	143	107.56	75.2%
22	2ply-50kg	144,541	1,440	143	100.38	70.2%
23	Off					
24	Off					
25	2ply-50kg	151,294	1,440	143	105.07	73.5%
26	2ply-50kg	144,434	1,440	143	100.30	70.1%
27	2ply-50kg	150,800	1,440	143	104.72	73.2%
28	2ply-50kg	151,200	1,390	143	108.78	76.1%
29	2ply-50kg	152,075	1,440	143	105.61	73.9%
30	Off					
31	Off					
<b>Total</b>		<b>3,653,836</b>	<b>36,760</b>	<b>3,718</b>	<b>2,586.25</b>	
<b>Average</b>		<b>140,532</b>	<b>1,414</b>	<b>143</b>	<b>99.47</b>	<b>69.6%</b>

Tabel 23: Kualitas Mesin Tubing T5

**Production Line** T5 **Table: Quality**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Tubes Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	130,290	529	99.6%
3	2ply-50kg	140,565	494	99.6%
4	2ply-50kg	154,743	493	99.7%
5	2ply-50kg	146,938	569	99.6%
6	2ply-50kg	151,250	593	99.6%
7	2ply-50kg	141,430	726	99.5%
8	2ply-50kg	140,990	487	99.7%
9	2ply-50kg	144,212	550	99.6%
10	2ply-50kg	154,647	708	99.5%
11	2ply-50kg	98,240	520	99.5%
12	2ply-50kg	151,150	535	99.6%
13	2ply-50kg	158,173	544	99.7%
14	2ply-50kg	154,983	596	99.6%
15	2ply-50kg	137,089	505	99.6%
16	2ply-50kg	154,657	598	99.6%
17	2ply-50kg	45,519	185	99.6%
18	2ply-50kg	98,765	537	99.5%
19	2ply-50kg	144,035	500	99.7%
20	2ply-50kg	156,932	572	99.6%
21	2ply-50kg	154,883	626	99.6%
22	2ply-50kg	144,541	548	99.6%
23	Off			
24	Off			
25	2ply-50kg	151,294	556	99.6%
26	2ply-50kg	144,434	564	99.6%
27	2ply-50kg	150,800	627	99.6%
28	2ply-50kg	151,200	552	99.6%
29	2ply-50kg	152,075	487	99.7%
30	Off			
31	Off			
<b>Total</b>		<b>3,653,836</b>	<b>14,201</b>	
<b>Average</b>		<b>140,532</b>	<b>546</b>	<b>99.6%</b>



Tabel 24: OEE Mesin Tubing T5

**Production Line** T5 **Table: OEE**  
**Tubing Machine 12M** Month/Year: **Jan-10**

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	97.4%	65.0%	99.6%	63.0%
3	2ply-50kg	100.0%	97.1%	70.3%	99.6%	68.0%
4	2ply-50kg	100.0%	100.0%	75.1%	99.7%	74.9%
5	2ply-50kg	100.0%	100.0%	71.4%	99.6%	71.1%
6	2ply-50kg	100.0%	100.0%	73.5%	99.6%	73.2%
7	2ply-50kg	100.0%	100.0%	68.7%	99.5%	68.3%
8	2ply-50kg	100.0%	100.0%	68.5%	99.7%	68.2%
9	2ply-50kg	100.0%	100.0%	70.0%	99.6%	69.8%
10	2ply-50kg	100.0%	100.0%	75.1%	99.5%	74.8%
11	2ply-50kg	100.0%	100.0%	47.7%	99.5%	47.5%
12	2ply-50kg	100.0%	100.0%	73.4%	99.6%	73.1%
13	2ply-50kg	100.0%	100.0%	76.8%	99.7%	76.5%
14	2ply-50kg	100.0%	96.6%	77.9%	99.6%	75.0%
15	2ply-50kg	100.0%	100.0%	66.6%	99.6%	66.3%
16	2ply-50kg	100.0%	100.0%	75.1%	99.6%	74.8%
17	2ply-50kg	100.0%	100.0%	22.1%	99.6%	22.0%
18	2ply-50kg	100.0%	66.7%	71.9%	99.5%	47.7%
19	2ply-50kg	100.0%	100.0%	69.9%	99.7%	69.7%
20	2ply-50kg	100.0%	98.5%	77.3%	99.6%	75.9%
21	2ply-50kg	100.0%	100.0%	75.2%	99.6%	74.9%
22	2ply-50kg	100.0%	100.0%	70.2%	99.6%	69.9%
23	Off					
24	Off					
25	2ply-50kg	100.0%	100.0%	73.5%	99.6%	73.2%
26	2ply-50kg	100.0%	100.0%	70.1%	99.6%	69.9%
27	2ply-50kg	100.0%	100.0%	73.2%	99.6%	72.9%
28	2ply-50kg	100.0%	96.5%	76.1%	99.6%	73.2%
29	2ply-50kg	100.0%	100.0%	73.9%	99.7%	73.6%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>98.2%</b>	<b>69.6%</b>	<b>99.6%</b>	<b>68.0%</b>

Tabel 25: Kerugian Mesin Tubing T5

Production Line **T5** Table: Losses  
Tubing Machine 12M Month/Year: Jan-10

Date	Type of Bag Produced	Total Tubes Produced	Speed Losses		Defects			
			Idling & Minor Stoppages	Reduced Speed	Rework		Reject	
			(min)	(min)	(pc)	(%)	(pc)	(%)
			(i)	(j)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	130,290	0	0	0	0.0%	529	0.406%
3	2ply-50kg	140,565	0	0	0	0.0%	494	0.352%
4	2ply-50kg	154,743	0	0	0	0.0%	493	0.319%
5	2ply-50kg	146,938	0	0	0	0.0%	569	0.387%
6	2ply-50kg	151,250	0	0	0	0.0%	593	0.392%
7	2ply-50kg	141,430	0	0	0	0.0%	726	0.514%
8	2ply-50kg	140,990	0	0	0	0.0%	487	0.346%
9	2ply-50kg	144,212	0	0	0	0.0%	550	0.381%
10	2ply-50kg	154,647	0	0	0	0.0%	708	0.458%
11	2ply-50kg	98,240	0	0	0	0.0%	520	0.529%
12	2ply-50kg	151,150	0	0	0	0.0%	535	0.354%
13	2ply-50kg	158,173	0	0	0	0.0%	544	0.344%
14	2ply-50kg	154,983	0	0	0	0.0%	596	0.385%
15	2ply-50kg	137,089	0	0	0	0.0%	505	0.368%
16	2ply-50kg	154,657	0	0	0	0.0%	598	0.387%
17	2ply-50kg	45,519	0	0	0	0.0%	185	0.407%
18	2ply-50kg	98,765	0	0	0	0.0%	537	0.544%
19	2ply-50kg	144,035	0	0	0	0.0%	500	0.347%
20	2ply-50kg	156,932	0	0	0	0.0%	572	0.365%
21	2ply-50kg	154,883	0	0	0	0.0%	626	0.404%
22	2ply-50kg	144,541	0	0	0	0.0%	548	0.379%
23	Off							
24	Off							
25	2ply-50kg	151,294	0	0	0	0.0%	556	0.368%
26	2ply-50kg	144,434	0	0	0	0.0%	564	0.390%
27	2ply-50kg	150,800	0	0	0	0.0%	627	0.416%
28	2ply-50kg	151,200	0	0	0	0.0%	552	0.365%
29	2ply-50kg	152,075	0	0	0	0.0%	487	0.320%
30	Off							
31	Off							
<b>Total</b>		<b>3,653,836</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>14,201</b>	
<b>Average</b>		<b>140,532</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>546</b>	<b>0.393%</b>

Tabel 26: Ketersediaan Mesin Bottomer T5

Production Line		T5		Table: Availability					
Bottomer 712B		Month/Year: Jan-10							
Date	Type of Bag Produced	Calendar Hours	Planned Off-Time	Loading Hours	Scheduled Downtime	Operating Hours	Unscheduled Downtime/ Breakdowns	Available Hours	Availability
		(minutes)	(min)	(min)	(min)	(min)	(min)	(min)	(%)
		(a)	(a1)	(b=a-a1)	(b1)	(c=b-b1)	(c1)	d=b-(b1+c1)	(A=d/b)
	Pasted								
1	Off								
2	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
3	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
4	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
5	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
6	2ply-50kg	1,440	0	1,440	0	1,440	312	1,128	78.3%
7	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
8	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
9	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
10	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
11	2ply-50kg	1,440	0	1,440	0	1,440	205	1,235	85.8%
12	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
13	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
14	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
15	2ply-50kg	1,440	0	1,440	0	1,440	150	1,290	89.6%
16	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
17	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
18	2ply-50kg	1,440	0	1,440	480	960	0	960	66.7%
19	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
20	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
21	2ply-50kg	1,440	0	1,440	0	1,440	420	1,020	70.8%
22	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
23	Off								
24	Off								
25	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
26	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
27	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
28	2ply-50kg	1,440	0	1,440	0	1,440	0	1,440	100.0%
29	2ply-50kg	1,440	0	1,440	0	1,440	192	1,248	86.7%
30	Off								
31	Off								
<b>Total</b>		<b>37,440</b>	<b>0</b>	<b>37,440</b>	<b>480</b>	<b>36,960</b>	<b>1,279</b>	<b>35,681</b>	
<b>Average</b>		<b>1,440</b>	<b>0</b>	<b>1,440</b>	<b>18</b>	<b>1,422</b>	<b>49</b>	<b>1,372</b>	<b>95.3%</b>

Tabel 27: Kinerja Mesin Bottomer T5

**Production Line** T5 **Table: Performance**  
**Bottomer 712B** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Bags Produced (pc) (e)	Available Hours (min) (d)	Production Rates		Performance (%) (P=g/f)
				Target (pc/min) (f)	Actual (pc/min) (g=e/d)	
					Pasted	
1	Off					
2	2ply-50kg	129,809	1,440	143	90	63.0%
3	2ply-50kg	120,132	1,440	143	83	58.3%
4	2ply-50kg	154,196	1,440	143	107	74.9%
5	2ply-50kg	146,376	1,440	143	102	71.1%
6	2ply-50kg	150,681	1,128	143	134	93.4%
7	2ply-50kg	140,896	1,440	143	98	68.4%
8	2ply-50kg	140,489	1,440	143	98	68.2%
9	2ply-50kg	143,664	1,440	143	100	69.8%
10	2ply-50kg	154,078	1,440	143	107	74.8%
11	2ply-50kg	97,635	1,235	143	79	55.3%
12	2ply-50kg	150,574	1,440	143	105	73.1%
13	2ply-50kg	157,568	1,440	143	109	76.5%
14	2ply-50kg	154,402	1,440	143	107	75.0%
15	2ply-50kg	136,567	1,290	143	106	74.0%
16	2ply-50kg	154,077	1,440	143	107	74.8%
17	2ply-50kg	45,344	1,440	143	31	22.0%
18	2ply-50kg	136,643	960	143	142	99.5%
19	2ply-50kg	143,516	1,440	143	100	69.7%
20	2ply-50kg	156,993	1,440	143	109	76.2%
21	2ply-50kg	154,335	1,020	143	151	105.8%
22	2ply-50kg	144,026	1,440	143	100	69.9%
23	Off					
24	Off					
25	2ply-50kg	150,749	1,440	143	105	73.2%
26	2ply-50kg	143,874	1,440	143	100	69.9%
27	2ply-50kg	150,228	1,440	143	104	73.0%
28	2ply-50kg	150,599	1,440	143	105	73.1%
29	2ply-50kg	132,551	1,248	143	106	74.3%
30	Off					
31	Off					
<b>Total</b>		<b>3,640,000</b>	<b>35,681</b>	<b>3,718</b>	<b>2,685</b>	
<b>Average</b>		<b>140,000</b>	<b>1,372</b>	<b>143</b>	<b>103</b>	<b>72.2%</b>

Tabel 28: Kualitas Mesin Bottomer T5

**Production Line** T5 **Table: Quality**  
**Bottomer 712B** Month/Year: **Jan-10**

Date	Type of Bag Produced	Total Bags Produced	Defects /Rejects	Quality
		(pc)	(pc)	(%)
		(e)	(h)	$[Q=(e-h)/e]$
	Pasted			
1	Off			
2	2ply-50kg	129,809	483	99.63%
3	2ply-50kg	120,132	437	99.64%
4	2ply-50kg	154,196	553	99.64%
5	2ply-50kg	146,376	561	99.62%
6	2ply-50kg	150,681	570	99.62%
7	2ply-50kg	140,896	535	99.62%
8	2ply-50kg	140,489	506	99.64%
9	2ply-50kg	143,664	548	99.62%
10	2ply-50kg	154,078	572	99.63%
11	2ply-50kg	97,635	568	99.42%
12	2ply-50kg	150,574	575	99.62%
13	2ply-50kg	157,568	604	99.62%
14	2ply-50kg	154,402	582	99.62%
15	2ply-50kg	136,567	521	99.62%
16	2ply-50kg	154,077	581	99.62%
17	2ply-50kg	45,344	175	99.61%
18	2ply-50kg	136,643	494	99.64%
19	2ply-50kg	143,516	524	99.64%
20	2ply-50kg	156,993	576	99.63%
21	2ply-50kg	154,335	554	99.64%
22	2ply-50kg	144,026	520	99.64%
23	Off			
24	Off			
25	2ply-50kg	150,749	550	99.64%
26	2ply-50kg	143,874	558	99.61%
27	2ply-50kg	150,228	573	99.62%
28	2ply-50kg	150,599	596	99.60%
29	2ply-50kg	132,551	520	99.61%
30	Off			
31	Off			
<b>Total</b>		<b>3,640,000</b>	<b>13,836</b>	
<b>Average</b>		<b>140,000</b>	<b>532</b>	<b>99.62%</b>

Tabel 29: OEE Mesin Bottomer T5

Production Line **T5** Table: OEE  
 Bottomer 712B Month/Year: Jan-10

Date	Type of Bag Produced	Loading	Availability	Performance	Quality	Overall Equipment Effectiveness OEE
		(%)	(%)	(%)	(%)	(%)
		(L=b/a)	A	P	Q	OEE=AxPxQ
	Pasted					
1	Off					
2	2ply-50kg	100.0%	100.0%	63.0%	99.6%	62.8%
3	2ply-50kg	100.0%	100.0%	58.3%	99.6%	58.1%
4	2ply-50kg	100.0%	100.0%	74.9%	99.6%	74.6%
5	2ply-50kg	100.0%	100.0%	71.1%	99.6%	70.8%
6	2ply-50kg	100.0%	78.3%	93.4%	99.6%	72.9%
7	2ply-50kg	100.0%	100.0%	68.4%	99.6%	68.2%
8	2ply-50kg	100.0%	100.0%	68.2%	99.6%	68.0%
9	2ply-50kg	100.0%	100.0%	69.8%	99.6%	69.5%
10	2ply-50kg	100.0%	100.0%	74.8%	99.6%	74.5%
11	2ply-50kg	100.0%	85.8%	55.3%	99.4%	47.1%
12	2ply-50kg	100.0%	100.0%	73.1%	99.6%	72.8%
13	2ply-50kg	100.0%	100.0%	76.5%	99.6%	76.2%
14	2ply-50kg	100.0%	100.0%	75.0%	99.6%	74.7%
15	2ply-50kg	100.0%	89.6%	74.0%	99.6%	66.1%
16	2ply-50kg	100.0%	100.0%	74.8%	99.6%	74.5%
17	2ply-50kg	100.0%	100.0%	22.0%	99.6%	21.9%
18	2ply-50kg	100.0%	66.7%	99.5%	99.6%	66.1%
19	2ply-50kg	100.0%	100.0%	69.7%	99.6%	69.4%
20	2ply-50kg	100.0%	100.0%	76.2%	99.6%	76.0%
21	2ply-50kg	100.0%	70.8%	105.8%	99.6%	74.7%
22	2ply-50kg	100.0%	100.0%	69.9%	99.6%	69.7%
23	Off					
24	Off					
25	2ply-50kg	100.0%	100.0%	73.2%	99.6%	72.9%
26	2ply-50kg	100.0%	100.0%	69.9%	99.6%	69.6%
27	2ply-50kg	100.0%	100.0%	73.0%	99.6%	72.7%
28	2ply-50kg	100.0%	100.0%	73.1%	99.6%	72.8%
29	2ply-50kg	100.0%	86.7%	74.3%	99.6%	64.1%
30	Off					
31	Off					
<b>Average</b>		<b>100.0%</b>	<b>95.3%</b>	<b>72.2%</b>	<b>99.6%</b>	<b>67.7%</b>

Tabel 30: Kerugian Mesin Bottomer T5

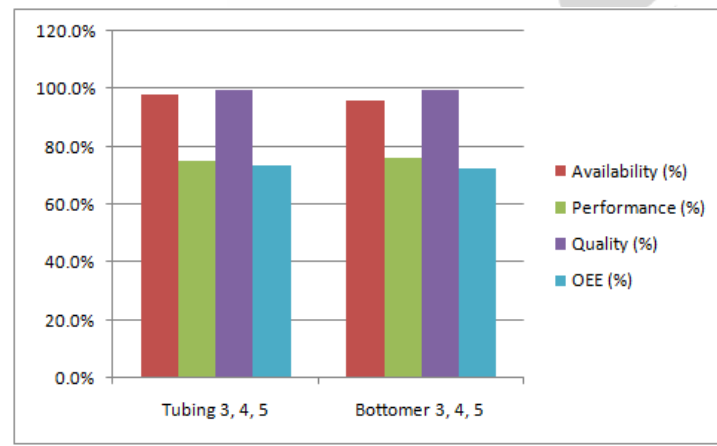
Production Line **T5** Table: Losses  
Bottomer 712B Month/Year: Jan-10

Date	Type of Bag Produced	Total Bags Produced	Speed Losses		Defects			
			Idling & Minor Stoppages	Reduced Speed	Rework		Reject	
			(min)	(min)	(pc)	(%)	(pc)	(%)
			(i)	(j)	(k)	(l=k/e)	(m)	(n=m/e)
	Pasted							
1	Off							
2	2ply-50kg	129,809	0	0	0	0.0%	483	0.372%
3	2ply-50kg	120,132	0	0	0	0.0%	437	0.364%
4	2ply-50kg	154,196	0	0	0	0.0%	553	0.359%
5	2ply-50kg	146,376	0	0	0	0.0%	561	0.383%
6	2ply-50kg	150,681	0	0	0	0.0%	570	0.378%
7	2ply-50kg	140,896	0	0	0	0.0%	535	0.379%
8	2ply-50kg	140,489	0	0	0	0.0%	506	0.360%
9	2ply-50kg	143,664	0	0	0	0.0%	548	0.382%
10	2ply-50kg	154,078	0	0	0	0.0%	572	0.371%
11	2ply-50kg	97,635	0	0	0	0.0%	568	0.582%
12	2ply-50kg	150,574	0	0	0	0.0%	575	0.382%
13	2ply-50kg	157,568	0	0	0	0.0%	604	0.383%
14	2ply-50kg	154,402	0	0	0	0.0%	582	0.377%
15	2ply-50kg	136,567	0	0	0	0.0%	521	0.382%
16	2ply-50kg	154,077	0	0	0	0.0%	581	0.377%
17	2ply-50kg	45,344	0	0	0	0.0%	175	0.386%
18	2ply-50kg	136,643	0	0	0	0.0%	494	0.362%
19	2ply-50kg	143,516	0	0	0	0.0%	524	0.365%
20	2ply-50kg	156,993	0	0	0	0.0%	576	0.367%
21	2ply-50kg	154,335	0	0	0	0.0%	554	0.359%
22	2ply-50kg	144,026	0	0	0	0.0%	520	0.361%
23	Off							
24	Off							
25	2ply-50kg	150,749	0	0	0	0.0%	550	0.365%
26	2ply-50kg	143,874	0	0	0	0.0%	558	0.388%
27	2ply-50kg	150,228	0	0	0	0.0%	573	0.381%
28	2ply-50kg	150,599	0	0	0	0.0%	596	0.396%
29	2ply-50kg	132,551	0	0	0	0.0%	520	0.392%
30	Off							
31	Off							
<b>Total</b>		<b>3,640,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>13,836</b>	
<b>Average</b>		<b>140,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>532</b>	<b>0.383%</b>

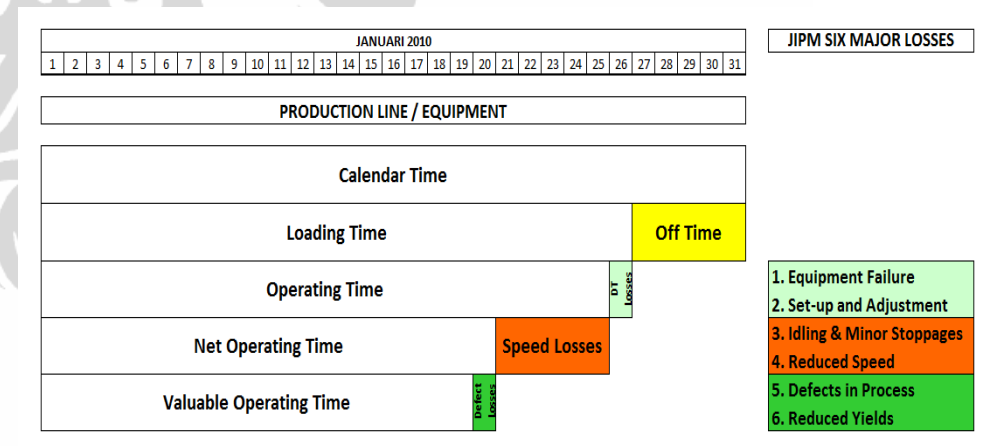
Tabel 31: OEE rata-rata Tubing T3, T4, T5, Bottomer B1, B2, B3 dan OLE rata-rata lini produksi T3-B1, T4-B2, T5-B3

Production Line	T3, T4, T5		Month/Year:	Jan-10	OEE	
Machine	Loading (%)	Availability (%)	Performance (%)	Quality (%)	OEE (%)	
Average Tubing 3	100.00%	97.74%	75.50%	99.75%	74.15%	
Average Tubing 4	100.00%	98.38%	80.41%	99.82%	78.96%	
Average Tubing 5	100.00%	98.18%	69.56%	99.61%	67.98%	
<b>Average Tubing</b>	<b>100.00%</b>	<b>98.10%</b>	<b>75.16%</b>	<b>99.73%</b>	<b>73.70%</b>	
Average Bottomer 1	100.00%	96.20%	76.73%	99.62%	73.83%	
Average Bottomer 2	100.00%	96.09%	80.05%	99.61%	76.64%	
Average Bottomer 3	100.00%	95.30%	72.21%	99.62%	67.73%	
<b>Average Bottomer</b>	<b>100.00%</b>	<b>95.86%</b>	<b>76.33%</b>	<b>99.61%</b>	<b>72.73%</b>	

Production Line	T3, T4, T5		Month/Year:	Jan-10	OLE	
Tubing + Bottomer	LA (%)	LP (%)	LQ (%)	OLE (%)		
T3-B1	96.97%	76.11%	99.68%	74.05%		
T4-B2	97.24%	80.23%	99.72%	77.79%		
T5-B3	96.74%	70.88%	99.61%	68.01%		
<b>Average</b>	<b>96.98%</b>	<b>75.74%</b>	<b>99.67%</b>	<b>73.28%</b>		



Gambar 4.1. Efektifitas rata-rata mesin-mesin produksi



Gambar 4.2. Ilustrasi kinerja lini produksi Pasted Bag



Tabel 32: Perhitungan LA, LP, LQ dan OLE lini produksi T3-B1

Production Line		T3-B1								
Date	Aef1	Aef2	LA	Pef1	Pef2	LP	Qef1	Qef2	LQ	OLE
1										
2	100.00%	90.83%	95.42%	85.28%	94.10%	89.69%	99.73%	99.64%	99.68%	85.30%
3	96.94%	100.00%	98.47%	79.92%	77.70%	78.81%	99.82%	99.63%	99.73%	77.39%
4	100.00%	100.00%	100.00%	75.98%	75.76%	75.87%	99.86%	99.63%	99.74%	75.67%
5	100.00%	93.26%	96.63%	85.80%	91.64%	88.72%	99.77%	99.61%	99.69%	85.47%
6	96.18%	100.00%	98.09%	81.11%	77.70%	79.40%	99.79%	99.61%	99.70%	77.65%
7	97.36%	100.00%	98.68%	83.68%	81.59%	82.63%	99.67%	99.62%	99.64%	81.25%
8	100.00%	96.18%	98.09%	75.75%	78.77%	77.26%	99.88%	99.61%	99.75%	75.59%
9	100.00%	100.00%	100.00%	83.82%	83.53%	83.67%	99.85%	99.60%	99.72%	83.44%
10	100.00%	100.00%	100.00%	85.81%	85.47%	85.64%	99.85%	99.62%	99.73%	85.41%
11	100.00%	100.00%	100.00%	81.90%	81.59%	81.74%	99.85%	99.61%	99.73%	81.52%
12	97.22%	100.00%	98.61%	86.75%	83.53%	85.14%	99.82%	99.61%	99.72%	83.72%
13	100.00%	94.10%	97.05%	83.41%	88.77%	86.09%	99.83%	99.61%	99.72%	83.32%
14	95.56%	100.00%	97.78%	85.52%	81.59%	83.55%	99.74%	99.62%	99.68%	81.44%
15	100.00%	91.60%	95.80%	60.45%	65.74%	63.10%	99.63%	99.61%	99.62%	60.22%
16	100.00%	100.00%	100.00%	68.25%	67.99%	68.12%	99.67%	99.61%	99.64%	67.88%
17	66.67%	66.67%	66.67%	32.33%	32.05%	32.19%	99.60%	99.61%	99.60%	21.37%
18	100.00%	100.00%	100.00%	72.10%	71.87%	71.98%	99.84%	99.63%	99.74%	71.80%
19	100.00%	83.75%	91.88%	81.92%	97.42%	89.67%	99.85%	99.63%	99.74%	82.17%
20	100.00%	89.10%	94.55%	85.91%	95.93%	90.92%	99.80%	99.64%	99.72%	85.73%
21	97.78%	100.00%	98.89%	69.85%	67.99%	68.92%	99.63%	99.63%	99.63%	67.90%
22	95.97%	100.00%	97.99%	73.28%	69.93%	71.61%	99.75%	99.63%	99.69%	69.94%
23										
24										
25	100.00%	100.00%	100.00%	79.87%	79.64%	79.76%	99.76%	99.62%	99.69%	79.51%
26	100.00%	100.00%	100.00%	85.85%	85.47%	85.66%	99.85%	99.62%	99.73%	85.43%
27	100.00%	100.00%	100.00%	66.31%	66.05%	66.18%	99.70%	99.61%	99.65%	65.95%
28	97.64%	100.00%	98.82%	55.92%	54.39%	55.16%	99.22%	99.61%	99.42%	54.19%
29	100.00%	95.63%	97.81%	56.10%	58.91%	57.51%	99.75%	99.61%	99.68%	56.07%
30										
31										
<b>Average</b>	<b>97.74%</b>	<b>96.20%</b>	<b>96.97%</b>	<b>75.50%</b>	<b>76.73%</b>	<b>76.11%</b>	<b>99.75%</b>	<b>99.62%</b>	<b>99.68%</b>	<b>74.05%</b>

Tabel 33: Perhitungan LA, LP, LQ dan OLE lini produksi T4-B2

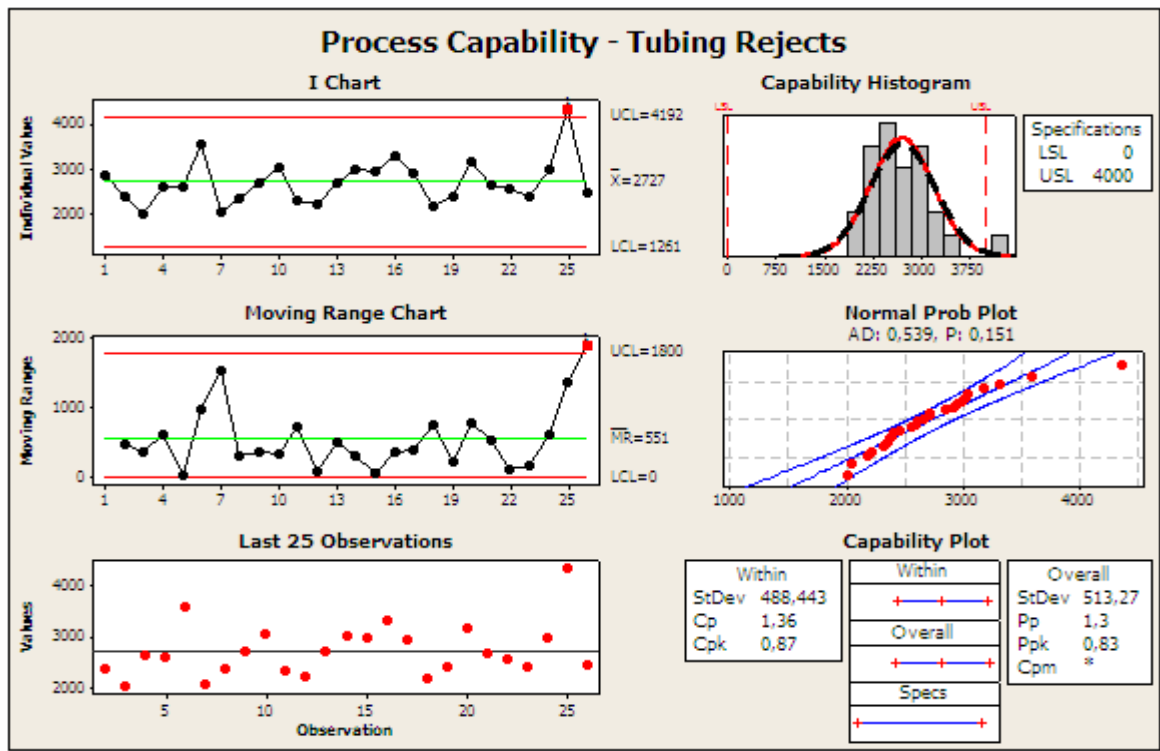
Production Line		T4-B2								
Date	Aef1	Aef2	LA	Pef1	Pef2	LP	Qef1	Qef2	LQ	OLE
1										
2	100.00%	100.00%	100.00%	73.33%	73.01%	73.17%	99.82%	99.62%	99.72%	72.97%
3	95.14%	95.14%	95.14%	71.33%	71.02%	71.17%	99.82%	99.63%	99.72%	67.53%
4	100.00%	98.47%	99.24%	87.09%	86.73%	86.91%	99.86%	99.63%	99.75%	86.03%
5	100.00%	97.22%	98.61%	82.70%	82.33%	82.52%	99.83%	99.61%	99.72%	81.14%
6	100.00%	98.40%	99.20%	85.13%	84.75%	84.94%	99.82%	99.61%	99.72%	84.03%
7	98.26%	98.33%	98.30%	81.01%	80.65%	80.83%	99.77%	99.61%	99.69%	79.21%
8	100.00%	92.22%	96.11%	79.35%	79.02%	79.19%	99.85%	99.63%	99.74%	75.91%
9	100.00%	92.15%	96.08%	81.17%	80.81%	80.99%	99.83%	99.61%	99.72%	77.59%
10	100.00%	98.54%	99.27%	87.04%	86.66%	86.85%	99.80%	99.62%	99.71%	85.97%
11	66.67%	65.42%	66.04%	82.94%	82.40%	82.67%	99.76%	99.40%	99.58%	54.37%
12	100.00%	97.92%	98.96%	85.07%	84.69%	84.88%	99.84%	99.61%	99.73%	83.77%
13	100.00%	98.19%	99.10%	89.03%	88.63%	88.83%	99.85%	99.61%	99.73%	87.78%
14	100.00%	98.19%	99.10%	87.23%	86.85%	87.04%	99.83%	99.61%	99.72%	86.01%
15	97.92%	98.33%	98.13%	78.80%	78.45%	78.62%	99.84%	99.61%	99.72%	76.94%
16	100.00%	98.06%	99.03%	87.05%	86.66%	86.86%	99.83%	99.61%	99.72%	85.77%
17	100.00%	96.25%	98.13%	25.62%	25.50%	25.56%	99.82%	99.61%	99.71%	25.01%
18	100.00%	98.13%	99.06%	77.18%	76.86%	77.02%	99.82%	99.63%	99.73%	76.09%
19	100.00%	97.99%	98.99%	81.07%	80.72%	80.89%	99.84%	99.63%	99.74%	79.87%
20	100.00%	98.68%	99.34%	88.68%	88.30%	88.49%	99.84%	99.62%	99.73%	87.67%
21	100.00%	98.26%	99.13%	87.17%	86.81%	86.99%	99.82%	99.63%	99.73%	86.00%
22	100.00%	98.40%	99.20%	81.35%	81.01%	81.18%	99.83%	99.63%	99.73%	80.32%
23										
24										
25	100.00%	98.47%	99.24%	85.15%	84.79%	84.97%	99.84%	99.63%	99.73%	84.10%
26	100.00%	95.83%	97.92%	81.29%	80.93%	81.11%	99.83%	99.60%	99.71%	79.19%
27	100.00%	97.01%	98.51%	84.88%	84.50%	84.69%	99.81%	99.61%	99.71%	83.18%
28	100.00%	94.93%	97.47%	85.10%	84.71%	84.91%	99.84%	99.60%	99.72%	82.52%
29	100.00%	97.78%	98.89%	74.90%	74.56%	74.73%	99.84%	99.60%	99.72%	73.69%
30										
31										
<b>Average</b>	<b>98.38%</b>	<b>96.09%</b>	<b>97.24%</b>	<b>80.41%</b>	<b>80.05%</b>	<b>80.23%</b>	<b>99.82%</b>	<b>99.61%</b>	<b>99.72%</b>	<b>77.79%</b>

Tabel 34: Perhitungan LA, LP, LQ dan OLE lini produksi T5-B3

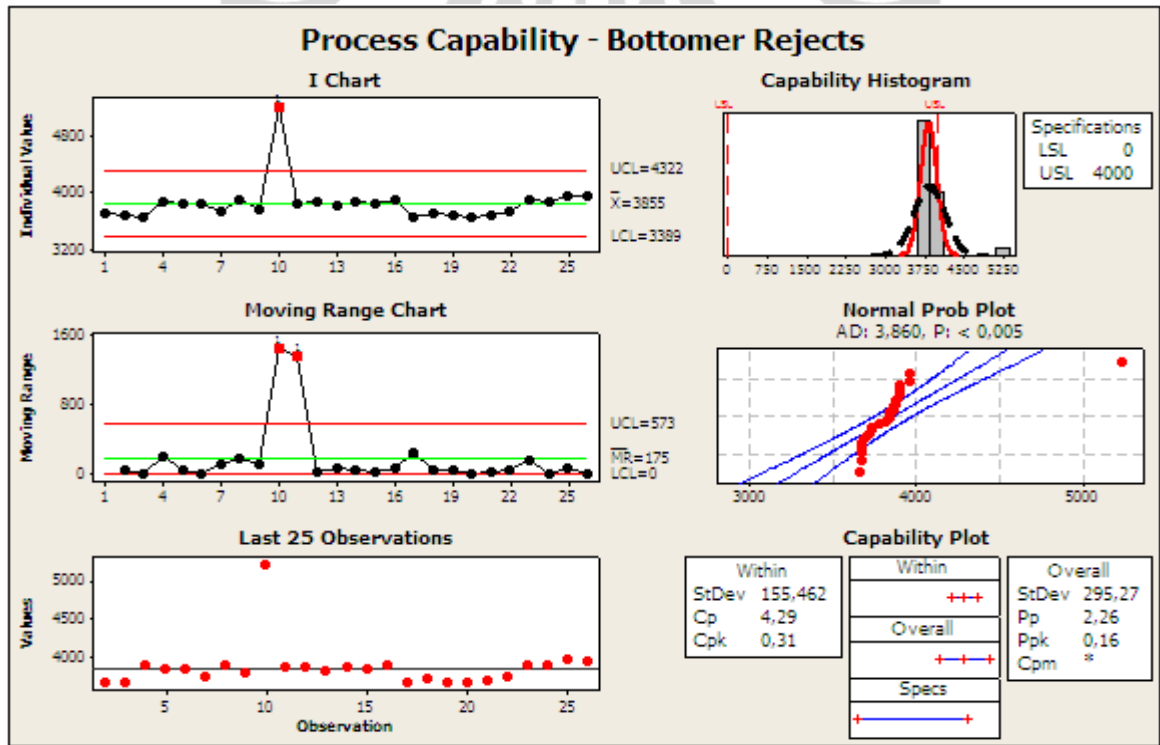
Production Line		T5-B3								
Date	Aef1	Aef2	LA	Pef1	Pef2	LP	Qef1	Qef2	LQ	OLE
1										
2	97.36%	100.00%	98.68%	64.99%	63.04%	64.01%	99.59%	99.63%	99.61%	62.92%
3	97.08%	100.00%	98.54%	70.31%	58.34%	64.33%	99.65%	99.64%	99.64%	63.16%
4	100.00%	100.00%	100.00%	75.15%	74.88%	75.01%	99.68%	99.64%	99.66%	74.76%
5	100.00%	100.00%	100.00%	71.36%	71.08%	71.22%	99.61%	99.62%	99.61%	70.95%
6	100.00%	78.33%	89.17%	73.45%	93.41%	83.43%	99.61%	99.62%	99.61%	74.11%
7	100.00%	100.00%	100.00%	68.68%	68.42%	68.55%	99.49%	99.62%	99.55%	68.25%
8	100.00%	100.00%	100.00%	68.47%	68.23%	68.35%	99.65%	99.64%	99.65%	68.11%
9	100.00%	100.00%	100.00%	70.03%	69.77%	69.90%	99.62%	99.62%	99.62%	69.63%
10	100.00%	100.00%	100.00%	75.10%	74.82%	74.96%	99.54%	99.63%	99.59%	74.65%
11	100.00%	85.76%	92.88%	47.71%	55.28%	51.50%	99.47%	99.42%	99.44%	47.56%
12	100.00%	100.00%	100.00%	73.40%	73.12%	73.26%	99.65%	99.62%	99.63%	72.99%
13	100.00%	100.00%	100.00%	76.81%	76.52%	76.67%	99.66%	99.62%	99.64%	76.39%
14	96.60%	100.00%	98.30%	77.91%	74.98%	76.45%	99.62%	99.62%	99.62%	74.86%
15	100.00%	89.58%	94.79%	66.57%	74.03%	70.30%	99.63%	99.62%	99.63%	66.39%
16	100.00%	100.00%	100.00%	75.11%	74.82%	74.96%	99.61%	99.62%	99.62%	74.68%
17	100.00%	100.00%	100.00%	22.11%	22.02%	22.06%	99.59%	99.61%	99.60%	21.98%
18	66.67%	66.67%	66.67%	71.94%	99.54%	85.74%	99.46%	99.64%	99.55%	56.90%
19	100.00%	100.00%	100.00%	69.95%	69.69%	69.82%	99.65%	99.64%	99.64%	69.57%
20	98.54%	100.00%	99.27%	77.34%	76.24%	76.79%	99.64%	99.63%	99.63%	75.95%
21	100.00%	70.83%	85.42%	75.22%	105.81%	90.51%	99.60%	99.64%	99.62%	77.02%
22	100.00%	100.00%	100.00%	70.19%	69.94%	70.07%	99.62%	99.64%	99.63%	69.81%
23										
24										
25	100.00%	100.00%	100.00%	73.47%	73.21%	73.34%	99.63%	99.64%	99.63%	73.07%
26	100.00%	100.00%	100.00%	70.14%	69.87%	70.00%	99.61%	99.61%	99.61%	69.73%
27	100.00%	100.00%	100.00%	73.23%	72.95%	73.09%	99.58%	99.62%	99.60%	72.80%
28	96.53%	100.00%	98.26%	76.07%	73.13%	74.60%	99.64%	99.60%	99.62%	73.03%
29	100.00%	86.67%	93.33%	73.85%	74.27%	74.06%	99.68%	99.61%	99.64%	68.88%
30										
31										
<b>Average</b>	<b>98.18%</b>	<b>95.30%</b>	<b>96.74%</b>	<b>69.56%</b>	<b>72.21%</b>	<b>70.88%</b>	<b>99.61%</b>	<b>99.62%</b>	<b>99.61%</b>	<b>68.01%</b>

Tabel 35: Cacat produksi dan DPMO Tubing T3, T4, T5 dan Bottomer B1, B2, B3

REJECTS						Production Line T3, T4, T5				Month/Year: Jan-10				DPMO						
T3		B1		T4		B2		T5		B3		DPMO								
T3 (%)		B1 (%)		T4 (%)		B2 (%)		T5 (%)		B3 (%)		Date	T3	T4	T5	Ave Tub	B1	B2	B3	Ave Bot
0.2682%	0.3625%	0.1818%	0.3805%	0.4061%	0.3721%	1														
0.1761%	0.3663%	0.1836%	0.3723%	0.3518%	0.3642%	2	2,682	1,818	4,061	2,854	3,625	3,805	3,721	3,717						
0.1432%	0.3744%	0.1427%	0.3668%	0.3188%	0.3587%	3	1,761	1,836	3,518	2,372	3,663	3,723	3,642	3,676						
0.2264%	0.3892%	0.1732%	0.3917%	0.3870%	0.3831%	4	1,432	1,427	3,188	2,015	3,744	3,668	3,587	3,666						
0.2135%	0.3875%	0.1756%	0.3868%	0.3922%	0.3783%	5	2,264	1,732	3,870	2,622	3,892	3,917	3,831	3,880						
0.3320%	0.3839%	0.2299%	0.3879%	0.5137%	0.3794%	6	2,135	1,756	3,922	2,604	3,875	3,868	3,783	3,842						
0.1160%	0.3917%	0.1547%	0.3682%	0.3456%	0.3601%	7	3,320	2,299	5,137	3,585	3,839	3,879	3,794	3,838						
0.1541%	0.3994%	0.1708%	0.3901%	0.3814%	0.3815%	8	1,160	1,547	3,456	2,055	3,917	3,682	3,601	3,733						
0.1522%	0.3835%	0.2049%	0.3794%	0.4578%	0.3711%	9	1,541	1,708	3,814	2,354	3,994	3,901	3,815	3,903						
0.1476%	0.3893%	0.2368%	0.5950%	0.5289%	0.5821%	10	1,522	2,049	4,578	2,716	3,835	3,794	3,711	3,780						
0.1825%	0.3860%	0.1583%	0.3905%	0.3536%	0.3820%	11	1,476	2,368	5,289	3,044	3,893	5,950	5,821	5,221						
0.1700%	0.3884%	0.1538%	0.3918%	0.3436%	0.3832%	12	1,825	1,583	3,536	2,315	3,860	3,905	3,820	3,862						
0.2573%	0.3821%	0.1722%	0.3853%	0.3846%	0.3769%	13	1,700	1,538	3,436	2,225	3,884	3,918	3,832	3,878						
0.3735%	0.3887%	0.1648%	0.3901%	0.3681%	0.3816%	14	2,573	1,722	3,846	2,714	3,821	3,853	3,769	3,814						
0.3287%	0.3900%	0.1731%	0.3856%	0.3866%	0.3771%	15	3,735	1,648	3,681	3,021	3,887	3,901	3,816	3,868						
0.4034%	0.3909%	0.1823%	0.3942%	0.4072%	0.3855%	16	3,287	1,731	3,866	2,961	3,900	3,856	3,771	3,842						
0.1583%	0.3655%	0.1753%	0.3697%	0.5436%	0.3616%	17	4,034	1,823	4,072	3,310	3,909	3,942	3,855	3,902						
0.1518%	0.3750%	0.1555%	0.3730%	0.3475%	0.3648%	18	1,583	1,753	5,436	2,924	3,655	3,697	3,616	3,656						
0.1967%	0.3597%	0.1626%	0.3751%	0.3646%	0.3669%	19	1,518	1,555	3,475	2,182	3,750	3,730	3,648	3,710						
0.3704%	0.3743%	0.1809%	0.3670%	0.4042%	0.3590%	20	1,967	1,626	3,646	2,413	3,597	3,751	3,669	3,672						
0.2500%	0.3743%	0.1696%	0.3693%	0.3789%	0.3612%	21	3,704	1,809	4,042	3,185	3,743	3,670	3,590	3,668						
						22	2,500	1,696	3,789	2,662	3,743	3,693	3,612	3,683						
						23														
						24														
0.2365%	0.3823%	0.1645%	0.3729%	0.3675%	0.3647%	25	2,365	1,645	3,675	2,562	3,823	3,729	3,647	3,733						
0.1516%	0.3835%	0.1748%	0.3967%	0.3904%	0.3880%	26	1,516	1,748	3,904	2,389	3,835	3,967	3,880	3,894						
0.2952%	0.3949%	0.1860%	0.3897%	0.4155%	0.3812%	27	2,952	1,860	4,155	2,989	3,949	3,897	3,812	3,886						
0.7782%	0.3875%	0.1634%	0.4048%	0.3650%	0.3959%	28	7,782	1,634	3,650	4,355	3,875	4,048	3,959	3,961						
0.2545%	0.3922%	0.1639%	0.4013%	0.3204%	0.3925%	29	2,545	1,639	3,204	2,463	3,922	4,013	3,925	3,953						
						30														
						31														
<b>0.2495%</b>	<b>0.3824%</b>	<b>0.1752%</b>	<b>0.3914%</b>	<b>0.3933%</b>	<b>0.3828%</b>	<b>Average</b>	2,495	1,752	3,933	2,727	3,824	3,914	3,828	3,855						



Gambar 4.3: Kapabilitas proses rata-rata Tubing T3, T4, T5 dengan Minitab



Gambar 4.4: Kapabilitas proses rata-rata Bottomer B1, B2, B3 dengan Minitab