

SINGLE RUN REPORTS

RUN UNIT LISTING REPORT

Each unit weight value received by SPPC II is stored within the database, and classified by the Line it is run on, Recipe, and Material. These weight data are also marked with a time/date stamp. The Unit Weight Listing Report presents a report containing each weight value along with a classifier mark of either '-' for Lo Reject values or '+' for weights that were Hi Reject values.

Run Unit listing reports from these types of production machinery will print a heading across the top of the page containing information on the run. The body of the report lists ten (10) unit weight values across the page, followed by an accumulated count of units including that line, and a time/date stamp.

The following is a sample screenshot of the Run Unit Listing Report.

Run Unit Listing Report												
Line	TSC Checkweigh Line											
Run Id:	250	Lot No										
Date Opened	7/25/2011 11:05:01 AM	Source										
Date Closed	7/25/2011 12:05:01 PM											
Material	[CHP]CHIPS											
Customer	NO-CUSTOMER											
Recipe	0000004:00012											
Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Unit Wt	Last Record	Last Record Time
48.98-	51.01+	50.28	48.12-	50.42	50.09	47.53-	52.57+	51.83+	51.62+		10	11:05 07/25/11
47.35-	50.41	52.80+	50.21	52.52+	48.68-	50.16	52.02+	48.00-	52.21+		20	11:06 07/25/11
52.88+	50.28	47.47-	49.91	50.40	48.74-	48.42-	49.96	50.81	51.51+		30	11:06 07/25/11
49.68	50.80	51.24+	50.16	48.63-	50.10	47.68-	52.53+	48.77-	52.73+		40	11:07 07/25/11
47.69-	47.18-	51.94+	52.10+	49.61	52.35+	50.76	48.00-	50.01	47.53-		50	11:08 07/25/11
47.28-	47.20-	48.64-	49.97	52.86+	50.89	51.70+	52.76+	47.70-	49.79		60	11:08 07/25/11
51.30+	50.85	49.93	49.41	49.80	50.59	48.30-	47.95-	50.25	49.75		70	11:09 07/25/11
50.53	47.94-	51.16+	48.23-	52.01+	52.41+	52.65+	51.75+	47.10-	49.44		80	11:09 07/25/11
51.86+	49.92	48.62-	50.19	47.71-	51.55+	49.82	49.15	51.15+	49.92		90	11:10 07/25/11
51.43+	47.55-	50.32	49.52	50.89	52.14+	49.99	47.83-	47.95-	48.15-		100	11:11 07/25/11
48.15-	49.78	47.04-	51.93+	52.63+	50.95	47.77-	48.01-	48.09-	47.37-		110	11:11 07/25/11
49.83	52.77+	52.45+	49.14	47.38-	52.72+	52.65+	51.28+	48.80-	48.00-		120	11:12 07/25/11
51.76+	48.95-	51.57+	49.39	48.57-	52.20+	48.61-	50.44	50.29	50.63		130	11:12 07/25/11
47.22-	52.07+	47.12-	52.26+	49.01	48.52-	50.08	51.73+	49.32	51.13+		140	11:13 07/25/11
50.28	51.98+	52.64+	51.01+	52.88+	48.12-	51.52+	51.03+	52.63+	49.16		150	11:13 07/25/11
47.01-	51.08+	52.08+	47.43-	50.50	47.17-	49.16	51.53+	47.34-	52.54+		160	11:13 07/25/11
49.69	47.75-	49.81	47.24-	47.95-	52.66+	52.12+	51.22+	51.70+	47.28-		170	11:14 07/25/11
47.17-	49.30	48.96-	51.49+	49.64	48.82-	48.26-	52.45+	47.07-	51.88+		180	11:15 07/25/11
50.95	51.55+	51.55+	50.00	50.31	50.47	48.86-	50.79	50.55	49.01		190	11:15 07/25/11

Once a Report is generated, the  icon on the report viewer provides an option to export the report as a PDF® or as an Excel® file.

RUN SUMMARY REPORTS

A summary report presents weight information from a particular Run in a format providing analysis of the unit weights received during the run. This summary of production provides the user with a wealth of information regarding the run of interest. Each of the items contained within the summary report are described in detail after the example report shown below:

Below the main heading of the report there is a table containing information regarding the specific Material and other information of this report.

- **Line:** Name of the Production Line
- **Run ID:** The particular Production Run for this report
- **Lot Number:** User entered Lot Number for the Production Run
- **Date Opened/Closed:** Time/Date the Production Run started and was closed
- **Material:** Type of Material packaged in this Production Run
- **Customer:** User entered Customer Name/Number for the Production Run

The 2nd table in the report contains specifics on the Recipe used in this report, and contains Target weight and reject/discard parameters for the Production Run.

The 3rd table in the report is a summary of statistics for the Production Run, and includes four (4) Columns and five (5) rows. A total of elapsed time is shown across the top of the chart, depicted in hours and Minutes for the report. This value is derived by the Date (time) Open and Closed. The column headings define the type of data recorded.

Produced units are all unit weights generated by the production scale, but does not include units considered to be discarded. Accepted units are all units that were not rejected, based upon the final parameters shown in the 2nd table in this report. Rejected units are all units that were rejected, based upon the final parameters shown in the 2nd table in this report.

Discarded units are those that are equal to or greater than the Lo/Hi Discard value shown in the 2nd table in this report, and are considered so far from the Target value as to be deemed as invalid data. A good example of this is an empty container weight or broken and near-empty package weight being generated by a production scale. The row headings define the type of analysis of the data in the column.

- **Total Units:** Total units either produced, accepted, rejected, or discarded in this report
- **Total Weight:** Total weight either produced, accepted, rejected, or discarded in this report
- **Units/Min:** Calculation based on elapsed time between when the first unit of the production run was generated by the scale and when the production run was closed, divided by the total number of units either produced or accepted.
- **Units Mean:** Mean weight based upon all valid (produced) weights divided by the number of valid (produced) weights
- **Unit Std. Dev.:** Defined below

A sample Run Summary report is shown below.

Run Summary Report						
Line	TSC Checkweigh Line					
Run Id:	250	Lot No				
Date Opened	7/25/2011 11:05:01 AM	Source				
Date Closed	7/25/2011 12:05:01 PM					
Material	CHPS					
Customer	NO-CUSTOMER					
Recipe	0000004.00012					
Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
47	48	49	50	51	52	53
Summary of	1	Hours	0	Minutes of operation		
	Produced	Accepted	Rejected	Discarded		
Total Units	1066	714	352	0		
Total Wt.	53301.1094	35723.6602	17577.4492	0		
Units / Min.	17.7667	11.9066				
Unit Mean	50.0011	50.001				
Unit Std. Dev.	1.7089	1.713				
±3 Sigma Distribution	1	Hours	0	Minutes of operation		
Cell Max	Cell Min	Cell Obs	0%	10%	20%	30%
55.1267	54.6385	0				
54.6384	54.1501	0				
54.1500	53.6617	0				
53.6616	53.1734	0				
53.1733	52.6850	52				
52.6849	52.1967	73				
52.1966	51.7083	103				
51.7082	51.2199	95				
51.2198	50.7316	68				
50.7315	50.2432	91				
50.2431	49.7549	94				
49.7548	49.2665	32				
49.2664	48.7782	87				
48.7781	48.2898	87				
48.2897	47.8014	76				
47.8013	47.3131	94				
47.3130	46.8247	51				
46.8246	46.3364	0				
46.3363	45.8480	0				
45.8479	45.3596	0				
45.3595	44.8713	0				
		1066				

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What is Standard Deviation?

Statistical analysis of your production is an important part of your quality assurance program, and can be of great benefit in improving the efficiency of your packaging operation. However, it is important that all terms within this report are understood to make the report meaningful.

Standard Deviation is a mathematical term whose definition loosely translates to 'average error'. Standard deviation is used to evaluate a set of data to determine the average error from the Mean, or average value of that set of data. In this report, Standard Deviation describes the calculated average error of product weight from the Mean weight. To derive Standard Deviation, all weight values occurring are compared to the Mean weight. The average difference or error between this value and the Mean weight is calculated and added with all other errors of all other weight values for this report. Once all errors are calculated, each error is squared, and then all values are added together. This number is then

divided by the number of values in the table, (minus 1, for one degree of freedom - WE USE AVERAGE IN CALCULATION THEREFORE DOF is 1), and the square root of this is calculated. The resulting value is the Standard Deviation. When evaluating a production report, the Standard Deviation provides a general idea of the degree of variance in the population of the report. It can provide information on the overall performance of your packaging line.

Below the summary of production is a bar graph or histogram divided into 21 'zones' showing the total number of units that have occurred in each zone during this report. The width of each zone is not arbitrarily set. Instead, it is calculated for each report so that the 21 zones cover a range of at least plus and minus 3 Sigma from either the Target or the Mean of the population included in this report. For reports having a very small Standard Deviation, the zone width may be only one unit of resolution. This is the minimum zone width. For reports having a larger Standard Deviation, each zone will expand to include larger ranges of weights to meet the plus and minus 3 Sigma requirement. The histogram on the run summary report is used to provide a graphical representation of the distribution of production weight values around either the Mean or Target (selectable in the report dialog), and to allow production personnel to determine the following:

1. Does the distribution of weights follow a normal "bell-shape" curve, or at least, is it "predictable" and consistent across multiple sets of data (runs)? (DISTRIBUTIONS DO NOT HAVE TO BE "NORMAL" IN ALL CASES; e.g., Target closer than -3 std dev from zero.) Generally expect to find that the majority of weights shall fall in the center of the distribution, and fewer weights towards each end.
2. Does the +/- 3 std dev range fall within the customer's spec (reject) limits? If not, then we are producing unacceptable product and customer needs to identify and eliminate causes of "non-normal" process variation where possible to effectively reduce the variation.
3. Is the distribution of weights centered about the target? If not, then the process needs to be adjusted so that the majority of weights fall closer to target, OR, that the majority of weights fall within spec. (e.g.: Some customers may want to move the distribution toward -3 std dev since it saves money and still produces acceptable product.

Remember that each "run" is just one sample and may not contain enough weights to be statistically valid. Remember that SPPC II does not do SPC (yet) and that no further assumptions can be made from the data.

What is 3 Sigma?

Between the summary of production boxes and the distribution graph is the statement '+/- 3 Sigma Distribution for 'X' Units Produced' Sigma is another mathematical term that means Standard Deviation. So, 3 Sigma equals the Standard Deviation times 3. In the summary report, we calculate the 3 Sigma value and generate a plus and minus weight value on each side of the Target or Mean (selectable at report generation time) weight. In this way the report bar graph contains the majority of weight values occurring during production.

Since Standard Deviation does qualify weight values within the report, some values at the high or low range may not always fall within the 3 Sigma distributions, and may not be included in the bar graph at the bottom of the page. So, the graph may not contain exactly the same number of unit weights as Total Units Produced in the Summary of Production box. The Histogram columns included the following headings:

- **Cell Max:** Maximum calculated weight for this row in the Histogram
- **Cell Min:** Minimum calculated weight value for this row in the Histogram
- **Cell Obj:** Number of weight occurrences falling within Cell Min and Cell Max for this row in the Histogram
- **0 to 40%:** Percentage of overall production falling within Cell Min and Cell Max.

UTILIZATION REPORT

By entering a maximum amount of acceptable idle time between weights, an efficiency report can detail how often a production line is running under acceptable production limits. The idle time is entered while setting up a Line in the configuration screen (*Refer to Configuration*). SPPC II allows each device on each production line to have a unique run line time. Calling a report based upon these criteria allows you to evaluate actual usage and efficiency of a connected production line.

A sample utilization report screen is shown below.

Run Line Utilization and Efficiency Report							
Line	Sim Line 1						
Run ID	250						
Date Opened	7/25/2011 11:05:01 AM						
Date Closed	7/25/2011 12:05:01 PM						
Material	CHIPS						
Customer	NO-CUSTOMER						
Recipe	CHIPS BAG 10						
Recipe Version Number	00012						
Lot Number							
Source Number							
Std Units/ Hr	1200						
Max Idle Secs	30						
Units	Grams						
Statistic Variable	Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
Unit Weight	47	48	49	50	51	52	53
Span Hrs	1						
Busy Hrs	1						
Idle Hrs	0						
Down Hrs	0						
Utilization Pct	100						
Efficiency Pct	88.98						

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SHIPPING REPORT

This report contains a block with specific production information, total SHIPPED units and weight. Listed below this is a list of every weight that passed the scale.

A sample Shipping report screen is shown below.

Shipping Report										
Line		TSC Checkweigh Line								
Run Id:	250	Lot No								
Date Opened	7/25/2011 11:05:01 AM	Source								
Date Closed	7/25/2011 12:05:01 PM									
Elapsed Time	1 hours 0 Minutes of Production									
Material	[CHP]CHIPS									
Customer	[] NO-CUSTOMER									
Total Units	714									
Total Weight	35723.6599693298									
Units/Min	17.7597904205322									
Unit Mean	50.0010757446289									
Unit Std. Dev.	1.708909034729									

Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
47	48	49	50	51	52	53
The units fall between 48 (Low Reject) and 52 (High Reject)						

Unit Wt	Last Record	Last Record Time										
48.98	51.01	50.26	48.12	50.42	50.09	51.63	51.62	50.41	50.21		10	11:05 07/25/11
48.68	50.16	50.26	49.91	50.40	48.74	48.42	49.96	50.81	51.51		20	11:06 07/25/11
49.68	50.60	51.24	50.16	48.63	50.10	48.77	51.94	49.61	50.76		30	11:07 07/25/11
50.01	48.64	49.97	50.89	51.70	49.79	51.30	50.65	49.93	49.41		40	11:09 07/25/11
49.80	50.59	48.30	50.25	49.75	50.53	51.16	48.23	51.75	49.44		50	11:09 07/25/11
51.86	49.92	48.62	50.19	51.55	49.82	49.15	51.15	49.92	51.43		60	11:10 07/25/11
50.32	49.52	50.69	49.99	48.15	48.15	49.78	51.93	50.95	48.01		70	11:11 07/25/11
48.09	49.83	49.14	51.28	48.80	51.76	48.95	51.57	49.39	48.57		80	11:12 07/25/11
48.61	50.44	50.29	50.63	49.01	48.52	50.08	51.73	49.32	51.13		90	11:13 07/25/11
50.28	51.98	51.01	48.12	51.52	51.03	49.16	51.08	50.50	49.16		100	11:13 07/25/11
51.53	49.69	49.81	51.22	51.70	49.30	48.96	51.49	49.64	48.82		110	11:15 07/25/11
48.26	51.68	50.95	51.55	51.55	50.00	50.31	50.47	48.86	50.79		120	11:15 07/25/11
50.55	49.01	50.81	50.54	51.46	51.44	48.30	49.06	51.32	50.43		130	11:16 07/25/11

RECIPE REPORTS

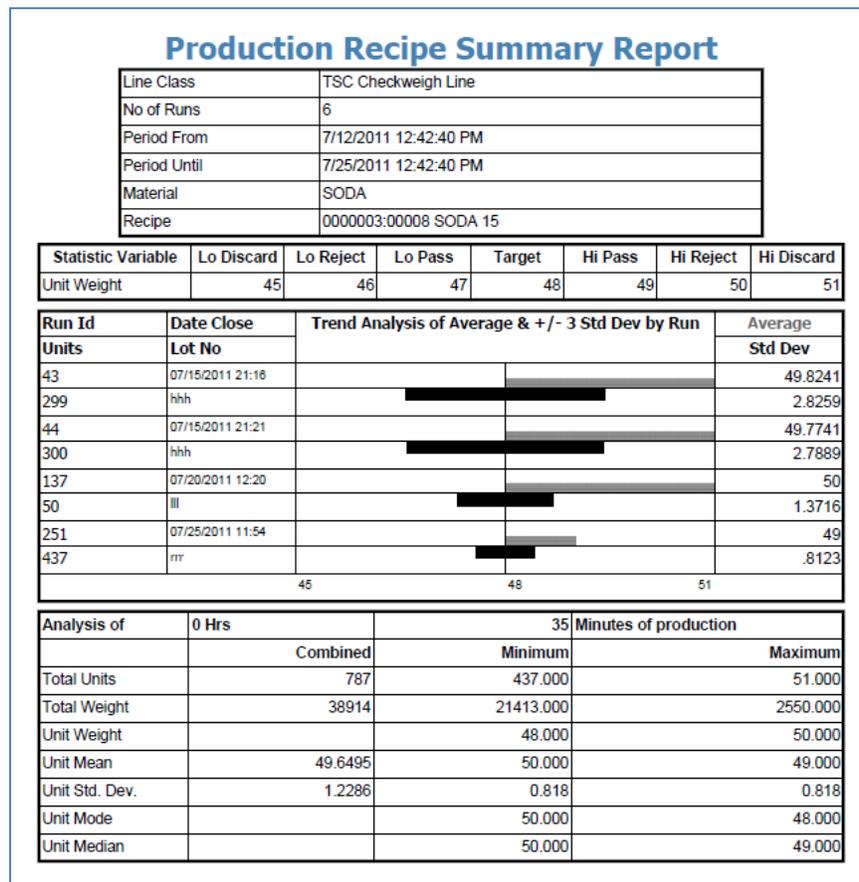
The Recipe reports are common to each recipe. The Recipe reports screen can be accessed by clicking on the **'Recipe Reports'** Tab on the Reports screen (Display -> Reports).

RECIPE SUMMARY

For the Recipe Summary report, a range of Dates should be picked for which the report should be generated. The first part of this report presents the header information on the line, production run, time and date, and the target and rejects limits for the recipe being reported upon.

The second part depicts multiple production runs of the same recipe over a span of time. This span of time is limited to the size of your database. Here we show statistics for each production run, followed by a graph of unit weights for each run distributed about the Target weight for all runs. You can see in some cases a run was started and either not run or was called again. Statistics for these runs do not skew overall statistics for the report.

A sample Recipe Summary screen is shown below.



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RECIPE VERSION HISTORY REPORT

SPPC II keeps track of each recipe, and each time a recipe is changed no matter how minor the change may be. This is extremely important for both security on the part of the product you manufacturer and control over your production line, and also plays a vital role in our reporting. If, for example, a recipe Target weight was changed from 50.00 lbs. to 55.00 lbs. It would not be possible to create a comparative report on this recipe over many runs since the data would not match between one recipe version and another.

Recipe Version History Report							
Recipe Code	SOD15						
Recipe Description	SODA 15						
Material Code	SOD						
Material Name	SODA						
Line Class	TSC Checkweigh Line						
ProductID	0000003						
Units	Grams						
Version Number	Version Date	Replace Date				Modified By	
00001	06/30/2011 20:04					admin	
Statistic Variable	Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
UnitWt	12	13	14	15	16	17	18
Version Number	Version Date	Replace Date				Modified By	
00002	06/30/2011 20:05					admin	
Statistic Variable	Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
UnitWt	12	13	14	15	16	17	18
Version Number	Version Date	Replace Date				Modified By	
00003	06/30/2011 20:06					admin	
Statistic Variable	Lo Discard	Lo Reject	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard
UnitWt	12	13	14	15	16	17	19
Version Number	Version Date	Replace Date				Modified By	
00004	06/30/2011 20:09					admin	

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LINE REPORTS

The Line reports are common to a Line. The Line reports screen can be accessed by clicking on the 'Line Reports' Tab on the Reports screen (Display -> Reports).

PRODUCTION SUMMARY REPORT

This report is time dependent and the user needs to enter a Date/Time range for which the report needs to be generated. Once the user enters the range, Clicking on the Production Summary Report button generates this report.

A list summary of all production runs during that period will be generated, with grand totals provided at the end of the report. A sample production summary report is shown below.

Production Summary Report									
Line		[1] Sim Line 1 CheckWeigher							
Start		7/24/2011 12:41:21 PM							
Until		7/25/2011 12:41:21 PM							
Recipe : Version		Statistic	Lo Discard	Lo Pass	Target	Hi Pass	Hi Reject	Hi Discard	
Material									
[CHP20] CHIPS BAG 10 : 12		UnitWt	47	49	50	51	52	53	
[CHP] CHIPS									
Run ID	Details	Group	Units	%	Weight	%	Units/Min	Average	Std. Dev.
227	CHIPS BAG 10 : 12 CHIPS 7/24/2011 1:05:01 PM 7/24/2011 2:05:01 PM	Produced Accepted Rejected Discarded	1105	100%	55,281	100%	18.45	50.03	1.743
228	CHIPS BAG 10 : 12 CHIPS 7/24/2011 2:05:01 PM 7/24/2011 3:05:02 PM	Produced Accepted Rejected Discarded	1066	100%	53,368	100%	17.76	50.06	1.742
229	CHIPS BAG 10 : 12 CHIPS 7/24/2011 3:05:02 PM 7/24/2011 4:05:00 PM	Produced Accepted Rejected Discarded	1057	100%	52,821	100%	17.82	49.97	1.735
230	CHIPS BAG 10 : 12 CHIPS 7/24/2011 4:05:00 PM 7/24/2011 5:05:00 PM	Produced Accepted Rejected Discarded	1047	100%	52,357	100%	17.46	50.01	1.729
231	CHIPS BAG 10 : 12 CHIPS 7/24/2011 5:05:00 PM 7/24/2011 6:05:00 PM	Produced Accepted Rejected Discarded	1043	100%	52,238	100%	17.38	50.08	1.745
232	CHIPS BAG 10 : 12 CHIPS 7/24/2011 6:05:00 PM 7/24/2011 7:05:00 PM	Produced Accepted Rejected Discarded	1091	100%	54,546	100%	18.19	50.00	1.752
233	CHIPS BAG 10 : 12 CHIPS 7/24/2011 7:05:00 PM 7/24/2011 8:05:01 PM	Produced Accepted Rejected Discarded	1105	100%	55,307	100%	18.44	50.05	1.728

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