X.1 | Difficulty Table

The printer (offset press, digital printer) Difficulty Table functions allow you to make adjustments for difficulties in printing. Adjustments can be made in the following areas:

- Printer Setup Time
- Printer Speed
- Paper Setup Waste
- Paper Run Waste

Difficulty Table

Large Press: 4 Color Press

PAPER DIFFICULTY TABLE is used to add more setup time, reduce press speed, and add more waste based on Paper's Waste Row#.
JOB DIFFICULTY TABLE is used based on Paper Specs entered in the Item Specs window.
SPEED ADJUSTMENT TABLE is used if (a) 'Use Paper Properties' option is selected to calculate Press Time or (b) Run Table has one QtyBreak only.

Paper Difficulty Table

Paper Waste Row #	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1				
2				
3	1.00	5	10	1
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

Job Difficulty Table

Difficulty Group	Difficulty Level	Run Size Area (sq.inch)	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
Run Size	Smallest	90	8.00	20	10	1
	Smaller than	216	8.00	20	10	1
	Larger than	410	16.00	30	15	1
	Largest	805	16.00	30	15	1
Coverage	Normal +		6.00	5	5	
	Medium		12.00	10	10	1
	Medium +		18.00	15	15	1
	Difficult		24.00	20	20	1
Registration	Normal +		5.00	5	5	
	Medium		10.00	10	10	1
	Medium +		15.00	15	15	1
	Difficult		20.00	20	20	1
Bleed	Any Side		2.00		5	
Print	Both Sides		2.00		3	
(reserved)						
Job Difficulty	Limits -->		30.00	50	50	10

Speed Adjustment

Run Quantity (per pass)	Increase Speed (%)
0	

OK Cancel

The Difficulty Table consists of three sections:

1. Paper Difficulty Table
2. Job Difficulty Table
3. Speed Adjustment Table

The following pages explain these sections.

Paper Difficulty Table

The Paper Difficulty Table has two purposes:

Purpose 1:

Many digital printers cannot run all types of papers at the same speed. The speed of a printer running Bond paper may be different than when the same printer runs Cover paper. In addition to the printer speed, paper waste may also vary for different papers on the same printer. The Paper Difficulty Table allows you to adjust for these variances.

The same is true for an offset press set up with Press A configuration. *(Press A and Press B are explained in "Offset Presses" as two different configurations of Press setup.)* The setup time, speed, and waste of Press A may not vary for most papers enough to justify setting it up as Press B, but some differences may exist for a few papers. The Paper Difficulty Table will allow you to adjust for those variances, as well.

Purpose 2:

Assume you have two Presses, Press 1 and Press 2, both set up with Press B configuration (using paper properties). Assume Press 2 takes a little longer to set up and runs a little slower than Press 1. You can set up Press 1 as your "standard" Press, so it will use the setup time and run speed assigned to Papers. The Paper Difficulty Table of Press 2 will allow you to customize the setup time, run speed, and waste to reflect the characteristics of Press 2.

The examples provided later in this section will illustrate the above information.

Understanding the Paper Difficulty Table

The Paper Difficulty Table allows you to make adjustments to the following areas:

- Setup Time per Plate
- Printer Speed
- Setup Waste for Paper
- Run Waste for Paper

Adjustment Areas in the Paper Difficulty Table

Paper Difficulty Table

Paper Waste Row #	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1				
2				
3	1.00	1	10	1
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

THE PAPER DIFFICULTY TABLE LINKS TO THE PAPER THROUGH THE WASTE TABLE ROW ASSIGNED TO THE PAPER.

ROW NUMBERS IN THE PAPER DIFFICULTY TABLE CORRESPOND TO THE WASTE TABLE ROW NUMBERS.

Waste Table

Setup sheets are per paper for digital printers and per plate for offset presses.
NOTE: Use Row# 20 to limit waste for bindery and other services. See Difficulty Table for additional waste.

Row #	Waste Description	Setup (sheets)	Break 1	Break 2	Break 3	Break 4	Break 5	Break 6	Break 7
0	#Impressions/Run Size Sheet ->		100	500	1000	5000	10000	100000	
			%	%	%	%	%	%	%
1		20	9.00	6.00	4.50	3.50	2.50	1.50	
2		25	11.00	6.50	5.00	3.80	2.80	1.80	
3		30	13.00	7.00	5.50	4.10	3.10	2.10	
4									
5									
6	Large press	30	10.50	6.00	4.50	2.50	1.00	0.50	
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20	Waste Limit (see NOTE above)	50	20.00						

Waste Table

EXAMPLE 1: *Paper Difficulty Table Setup for a Digital Printer*

From the Setup Windows of Paper X and Y

Waste… field for Paper X

Waste...	Use Waste Table Row # 1	▾

Waste… field for Paper Y

Waste...	Use Waste Table Row # 3	▾

From the Setup Window of Digital Printer

Waste… field

Waste...	Use following Waste Properties:
	Setup (#Sheets)	5
	+ % of Run Qty	1

Setup and Run Tables

Setup Table			
Per	Minutes	Mat.Cost	Setup Price
Lot (1)	3.00		

Run Table			
QtyBreak	Units/Hour	Mat.Cost	Run Price
1	3000.00	0.04	

Mat.Costs and Run Prices are Per Each

From the Setup Window of Digital Printer

Paper Difficulty Table				
Paper Waste Row #	Add Time (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1				
2				
3	2.00	10		

Waste Table

		Break 1	Break 2	Break 3	Break 4
0	#Impressions/Run Size Sheet ->	100	500	1000	5000
Row #	Waste Description	Setup (sheets)	%	%	%	%
1		20	9.00	6.00	4.50	3.50
2		25	11.00	6.50	5.00	3.80
3		30	13.00	7.00	5.50	4.10

When this selection is made for the Printer:

a. Printer's Plan ignores the waste properties assigned to papers and uses the ones assigned to the printer.

b. Printer's Plan uses the Waste Table row numbers assigned to papers only to link to the Paper Difficulty Table row numbers.

c. You do not need to assign Setup and Run Waste property adjustments in the Paper Difficulty Table, because Printer's Plan uses the waste properties assigned to the printer instead.

According to the Paper and Printer setup and Paper Difficulty Table shown on the left:

For Paper X:

Since Paper Waste Row #1 is blank in the Paper Difficulty Table:

Setup = 3.00 min/plate (no adjustment)
Run speed = 3,000 units/hr (no adjustment)

For Paper Y:

Adjustments from Paper Waste Row #3:

Setup Plate = 3.00 + 2.00 = 5.00 minutes
Run speed = 3000 − (3000*0.10) = 2,700 units/hr

WASTE TABLE PROPERTIES ARE IGNORED.

EXAMPLE 2: *Using the Paper Difficulty Table for an Offset Press (Press A - Ignores Paper Properties)*

From Setup Window of Press A

Time… field

Time...	Use Setup and Run Tables (ignore Paper Properties) ▾

Setup and Run Tables

Setup Table			
Per	Minutes	Mat.Cost	Setup Price
Plate	8.00		
Wash	15.00		

Run Table			
QtyBreak	Units/Hour	Mat.Cost	Run Price
1000	6000.00		

Paper Difficulty Table of Press A

Paper Difficulty Table				
Paper Waste Row #	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1				
2				
3	1.00	5	10	1

From Setup Windows of Paper X and Y

Waste… field for Paper X

Waste...	Use Waste Table Row# 1 ▾

Waste… field for Paper Y

Waste...	Use Waste Table Row# 3 ▾

Waste Table

Row #	Waste Description	Setup (sheets)	Break 1 %	Break 2 %	Break 3 %	Break 4 %
0	#Impressions/Run Size Sheet ->		100	500	1000	5000
1		20	9.00	6.00	4.50	3.50
2		25	11.00	6.50	5.00	3.80
3		30	13.00	7.00	5.50	4.10
4						
5						
6	Large press	30	10.50	6.00	4.50	2.50

According to the Paper and Press setup and Paper Difficulty and Waste Tables shown on the left:

For Paper X: (Assigned Waste Table Row #1):

Since Paper Waste Row #1 is blank in the Paper Difficulty Table, no adjustments are made.

Setup Plate = 8.00 min/plate (no adjustment)
Run Speed = 6,000 units/hr (no adjustment)
Setup Waste = 20 sheets/plate (no adjustment)
**Run Waste %** = 9.0, 6.0, 4.5, 3.5 (no adjustment)

For Paper Y: (Assigned Waste Table Row #3):

Adjustments are made from Paper Waste Row #3 of the Paper Difficulty Table:

Setup Plate = 8.00 + 1.00 = 9.00 minutes/plate
Run Speed = 6000 – (6000*0.05) = 5,700 units/hr
Setup Waste = 30 + 10 = 40 sheets
Run Waste % (1% added) = 14.0, 8.0, 6.5, 5.1

NOTE:

The above examples assume that the selection in the **Waste…** field of the Press is as follows:

Waste...	Use Paper's Waste Properties ▾

If, in the **Waste…** field of the Press, a Waste Table row is selected instead, such as:

Waste...	Use Waste Table Row# 6 Large press ▾

then, Printer's Plan applies the setup and run waste adjustments to the numbers in the Waste Table row selected (Row #6 in the above figure).

EXAMPLE 3: *Using the Paper Difficulty Table for an Offset Press (Press B - Uses Paper Properties)*

From Setup Windows of Paper X and Y

Waste… field for Paper X

| Waste... | Use Waste Table Row# 1 | ▼ |

Waste… field for Paper Y

| Waste... | Use Waste Table Row# 3 | ▼ |

Time… field of Paper X

Time...	Production Standards for Offset Presses:
	Setup (Min/Plate)	6
	Run (Imp/Hr)	4800

Time… field of Paper Y

Time...	Production Standards for Offset Presses:
	Setup (Min/Plate)	12
	Run (Imp/Hr)	3400

From Setup Window of Press B

Time… and Waste… fields of Press B

| Time... | Use Paper Properties + Setup Table | ▼ |
| Waste... | Use Paper's Waste Properties | ▼ |

Paper Difficulty Table of Press B-1 ("Standard" Press)

Paper Difficulty Table				
Paper Waste Row #	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1				
2				
3				

Paper Difficulty Table of Press B-2 (Runs Slower, Needs More Setup Time, and Wastes More Paper than the "Standard" Press)

Paper Difficulty Table				
Paper Waste Row #	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
1	1.00	5	3	1
2	1.00	5	3	1
3	1.00	5	3	1
4				

Waste Table

			Break 1	Break 2	Break 3	Break 4
0	#Impressions/Run Size Sheet ->		100	500	1000	5000
Row #	Waste Description	Setup (sheets)	%	%	%	%
1		20	9.00	6.00	4.50	3.50
2		25	11.00	6.50	5.00	3.80
3		30	13.00	7.00	5.50	4.10

According to the Paper and Press setup and the Paper Difficulty and Waste Tables shown above and on the left:

Press B-1 uses the Paper properties; therefore, no adjustments are entered in the Paper Difficulty Table.

Press B-2, compared to the "standard" press, needs one minute per plate longer for setup, runs 5% slower, and wastes 3 more setup sheets and 1% more paper during the run. These adjustments are entered in its Paper Difficulty Table.

For Paper X on Press B-2:
 Setup time = 6 + 1 = 7 minutes/plate
 Run speed = 4800 – (4800 * 0.05) = 4,560 imp/hr
 Setup Waste = 20 + 3 = 23 sheets/plate
 Run Waste (%) (1% added) = 10.0, 7.0, 5.5, 4.5

For Paper Y on Press B-2:
 Setup time = 12 + 1 = 13 minutes/plate
 Run speed = 3400 – (3400 * 0.05) = 3,230 imp/hr
 Setup Waste = 30 + 3 = 33 sheets/plate
 Run Waste (%)(1% added) = 14.0, 8.0, 6.5, 5.1

NOTE:

If, in the **Waste…** field of the Press, a Waste Table row is selected instead, such as:

| Waste... | Use Waste Table Row# 5 | ▼ |

then, Printer's Plan applies the setup and run waste adjustments to the numbers in the Waste Table row selected (Row #5 in the above figure).

Job Difficulty Table

The Job Difficulty Table allows you to adjust the setup time, printer speed, and setup and run waste for the following job difficulties:

- Run Size
- Ink Coverage
- Ink Registration
- Bleeds
- Printing on Both sides

Additionally, you can assign the minimum and maximum run size limits for a printer using this table.

The following is a sample setup of a Job Difficulty Table.

Job Difficulty Table						
Difficulty Group	Difficulty Level	Run Size Area (sq.inch)	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
Run Size	Smallest	15	4.00	10	10	2
	Smaller than	46	4.00	10	10	2
	Larger than	119	8.00	25	20	4
	Largest	216	8.00	25	20	4
Coverage	Normal +		3.00	5	10	1
	Medium		6.00	10	20	2
	Medium +		9.00	15	30	3
	Difficult		12.00	20	40	4
Registration	Normal +		2.50	5	10	1
	Medium		5.00	10	20	2
	Medium +		7.50	15	30	3
	Difficult		10.00	20	40	4
Bleed	Any Side		5.00	2	10	2
Print	Both Sides		1.00	1	10	1
(reserved)						
Job Difficulty Limits -->			15.00	50	50	10

The Job Difficulty Table is further explained below.

Run Size Limits

Difficulty Group	Difficulty Level	Run Size Area (sq.inch)
Run Size	Smallest	15
	Smaller than	46
	Larger than	119
	Largest	216

MINIMUM RUN SIZE AREA

MAXIMUM RUN SIZE AREA

Run sizes are expressed as width by height in inches. Printer's Plan multiplies the width by the height to arrive at the Run Size Area in square inches.

EXAMPLE:
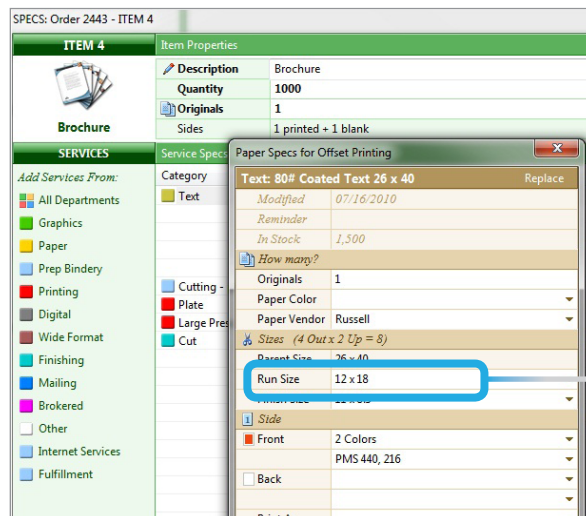
RUN SIZE = 12 IN. X 18 IN.
*RUN SIZE AREA = 12 * 18 = 216 SQUARE INCHES*

Jobs | Item of a Job | Specs Window | Paper Specs Window

If the Run Size area is smaller than the Minimum Run Size area or larger than the Maximum Run Size area, Printer's Plan displays an alert message when you close the Item Specs window. See the following:

If the Run Size Area is too small:

Paper Run Size may be too small for this press.
Do you want to change the size or select another press?

Yes   No

If the Run Size Area is too large:

Paper Run Size may be too large for this press.
Do you want to change the size or select another press?

Yes   No
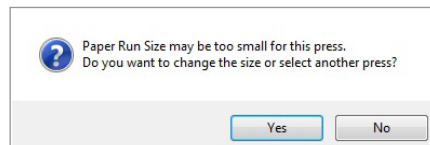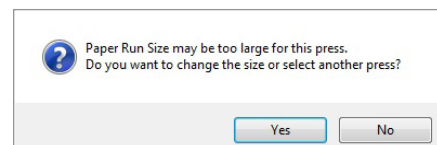
If you click "Yes", Printer's Plan will open the Press list window for you to choose another Press.

If you click "No", Printer's Plan will close the Specs window and price the Item using the appropriate values assigned to the Press Difficulty Table.

Run Size Difficulties

Usually when the Run Size area is smaller or larger than the standard Run Size area specified for a press, the setup time may take longer, the press may slow down, and the paper waste may increase. The Run Size section of the Job Difficulty Table is designed to allow for these adjustments.

Difficulty Group	Difficulty Level	Run Size Area (sq.inch)	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)	
Run Size	Smallest	15	4.00	10	10	2	A
	Smaller than	46	4.00	10	10	2	B
	Larger than	119	8.00	25	20	4	C
	Largest	216	8.00	25	20	4	D

According to the above table (sq. in. = square inches):

When the Run Size Area is 15 sq. in. or smaller:
  Time per Plate: Increased by 4.00 minutes
  Printer Speed: Reduced by 10%
  Setup Waste: Increased by 10 sheets per plate
  Run Waste: Increased by 2%
  A

When the Run Size Area is smaller than 46 sq. in. but larger than 15 sq. in.:
  Time per Plate: Increased by 4.00 minutes
  Printer Speed: Reduced by 10%
  Setup Waste: Increased by 10 sheets per plate
  Run Waste: Increased by 2%
  B

When the Run Size Area is 46 sq. in. or 119 sq. in., or any size in between:
  Normal range; no Run Size difficulties are added.

When the Run Size Area is larger than 119 sq. in. but smaller than 216 sq. in.:
  Time per Plate: Increased by 8.00 minutes
  Printer Speed: Reduced by 25%
  Setup Waste: Increased by 20 sheets per plate
  Run Waste: Increased by 4%
  C

When the Run Size Area is 216 sq. in. or larger:
  Time per Plate: Increased by 8.00 minutes
  Printer Speed: Reduced by 25%
  Setup Waste: Increased by 20 sheets per plate
  Run Waste: Increased by 4%
  D

Coverage, Registration, and Bleed Difficulties

This section of the Job Difficulty Table is designed to allow for adjustments because of additional time or paper waste needed for larger ink coverage area, closer registration, and the number of sides that bleed.

Job Difficulty Table						
Difficulty Group	Difficulty Level	Run Size Area (sq.inch)	Add Time/Plate (minutes)	Reduce Speed (%)	Add Waste (sheets)	Add RunWaste (%)
Coverage	Normal +	3.00	5	10	1
	Medium	6.00	10	20	2
	Medium +	9.00	15	30	3
	Difficult	12.00	20	40	4
Registration	Normal +	2.50	5	10	1
	Medium	5.00	10	20	2
	Medium +	7.50	15	30	3
	Difficult	10.00	20	40	4
Bleed	Any Side	5.00	2	10	2

The difficulty levels, Normal +, Medium, Medium +, and Difficult, correspond to the options offered in the **Coverage** and **Registration** fields of the Paper Specs window of the Item Specs.

According to the levels selected in these fields, Printer's Plan will apply the corresponding adjustments.

Please note, one set of adjustments will apply for bleed on any number of sides.

Printing on Both Sides

In a two-sided job, printing the second side, especially on an offset press, usually requires some additional setup time and slowdown of the press, as well as added paper waste to ensure that the text and images on the second side will line up correctly with the first side. Adjustments entered in this row accommodate the second-side printing difficulty.

Job Difficulty Limits

When more than one difficulty in a job is present, such as small Run Size, Medium Coverage, and Bleed on two sides, Printer's Plan will total the adjustment factors for each difficulty. Sometimes the additional setup time, reduced speed, and additional waste applied for one or two difficulties may also address the rest of the difficulties, and you may not need the additional adjustments. For this reason, you may want to assign limits to the adjustments using the **Job Difficulty Limits -->** section.

Job Difficulty Limits -->	15.00	50	50	10

Speed Adjustment

The Speed Adjustment Table refers to press speed and is normally used with presses that use paper properties.

Press Setup | Time Field

Paper Setup | Time Field

Since only one press run speed is assigned to papers, the Speed Adjustment Table allows you to modify this speed for longer press runs.

Speed Adjustment Table

According to the Speed Adjustment Table on the left:

For run quantities (number of impressions per pass) up to 1,000, the press speed is the same as what is assigned to the paper (4,800 impressions/hour from the figure above). The press speed changes for quantities greater than 1,000. At the quantity break 5,000, it is 5% higher, at 10,000 10% higher, and at 20,000 15% higher. The speed for quantities between the quantity breaks is interpolated linearly. The speed at the last quantity break stays the same for all quantities greater than the break point.

See the following example:

EXAMPLE:

Number of Impressions per Pass	Press Speed for the Quantity Shown in the Left Column (Impressions per Hour)
1,000 or Less	4,800
3,000	4,920 (interpolated)
5,000	5,040 (5% increase)
8,000	5,184 (interpolated)
10,000	5,280 (10% increase)
20,000	5,520 (15% increase)
More than 20,000	5,520