ELIMINATION OF DOWNTIME
BETWEEN COILS USING COIL END WELDING

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ABSTRACT: The average production line loses twenty to thirty percent of its productive day due to downtime from coil changes and rethreading. The same equipment can produce 20 - 30% more parts in a day by adding a Coil End Welder to the line. In addition, you can reduce scrap and tooling wear. You will also produce better quality parts.

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The purpose of this presentation is to show how to increase productivity on an existing stamping line by reducing downtime.

In order to get more parts off an existing line of equipment, we can do two things.

- Run a higher rate of speed.
- Reduce the downtime between coils.

Running at a higher rate of speed may require investing in new equipment and/or modifying existing equipment. This can be very costly. Also, running at higher speeds means more coils will be used and more coils mean more downtime between coils. Running faster may require one or more of the following.

- Modify existing drive system
- Closely examine the cut-off capabilities and make changes where necessary
- Faster coil handling at the entry end
- Additional attention to exit handling problems
- Probably more labor at either entry or exit end of the line
- Faster speeds mean more coils; more coils mean more downtime between coils.

Quick time saving ideas

- If you are using a single ended uncoiler changes to a double ended uncoiler or a pallet decoiler.
- If you are using manual keeper arms change to a powered Outboard coil retainer.
- If the material if difficult to straighten and feed up consider a flattener.
- If you are running heavy gauge consider more automation.

Secondly let's examine reducing downtime between coils. Coil related downtime can be greatly reduced by using the following methods.

- Faster or more efficient coil handling.
- Joining the end of the expended coil to the end of the new coil. This eliminates rethreading the press which saves time as well as reducing scrap and tooling damage.

The rest of this presentation will concern itself with the methods available today to handle coils faster and join coil ends together to reduce downtime between coils.

First, let's look at the cost of coil related downtime. The chart shown below gives the cost of coil related downtime in reference to additional feet of product and profit.

Based on an industry average of 10 minutes of coil change time for Roll formers, the following chart shows the amount of coils run per shift at various thicknesses and line speeds.

DOWNTIME COST STUDY

Coil Run Time

Chart Based on average coil size of				OD 56	ID 20
Thickness	**Feet in Coil**	**Run Time (Minutes)**			
	Line Speed	**50**	**100**	**150**	**200**
0.035	5114	102	51	34	26
0.049	3653	73	37	24	18
0.065	2754	55	28	18	14
0.095	1884	38	19	13	9
0.120	1492	30	15	10	7
0.156	1147	23	11	8	6

The chart below shows an example of lost production per year based on average roll forming line speed of 100 FPM at different thicknesses.

Example Lost Production per year

Based on 10 Minute coil Change and 100 FPM Line Speed and 400 Minutes/Shift
1 Shift per day 240 work days per year

Thickness	**Line Speed**	**Coils/Day**	**Lost Minutes**	**Lost Footage**	**Lost Footage**
	FPM		**Per Day**	**Per Day**	**Per Year**
0.035	100	7.8	78.2	7,822	1,877,305
0.049	100	11.0	109.5	10,951	2,628,227
0.065	100	14.5	145.3	14,527	3,486,423
0.095	100	21.2	212.3	21,231	5,095,541
0.120	100	26.8	268.2	26,819	6,436,473
0.156	100	34.9	348.6	34,864	8,367,415

The following chart is an example of the typical increase in profit using a profit per foot scenario. This is based on reducing the typical 10 minutes overall coil change time to 3 minutes to make an average end weld.

Example of Savings Using End Welder

Cost Savings per year using End Welder to Eliminate Downtime
Based on 3 minutes end weld time

Thickness	Lost Footage Per Shift	Savings Based on Profit Per Foot			
		$ 0.005	$ 0.010	$ 0.020	$ 0.030
	Per Year				
0.035	1,689,574	$ 8,448	$ 16,896	$ 33,791	$ 50,687
0.049	2,365,404	$ 11,827	$ 23,654	$ 47,308	$ 70,962
0.065	3,137,781	$ 15,689	$ 31,378	$ 62,756	$ 94,133
0.095	4,585,987	$ 22,930	$ 45,860	$ 91,720	$ 137,580
0.120	5,792,826	$ 28,964	$ 57,928	$ 115,857	$ 173,785
0.156	7,530,674	$ 37,653	$ 75,307	$ 150,613	$ 225,920

The following chart is an example of the what scrap costs can add up to due to coil changes with rethreading of the processing line.

Scrap Costs Based on .20/lb.

Thickness	Coils/Day	Scrap Feet per Coil	Scrap Feet per Year	Cost per Yr. per Inch Width
0.035	7.8	10	18,773	$ 446
0.049	11.0	10	26,282	$ 875
0.065	14.5	10	34,864	$ 1,539
0.095	21.2	10	50,955	$ 3,288
0.120	26.8	10	64,365	$ 5,246
0.156	34.9	10	83,674	$ 8,866