MetalForming Magazine

Selecting the Right Feed Line

Need to feed thick, thin, wide or narrow material? What about cosmetic requirements? Consider these parameters and more when purchasing a new coil-feed line.

BY TODD WENZEL

Selecting the right feed line is an essential building block in the production of stamped parts. The wrong feed line can actually restrict the profit-generating capabilities of a press and be unsafe to operate. Here we offer some general guidelines stampers can use to help evaluate their needs and make an appropriate selection of a servo-feed line, without spending more money than they need to.

Matching the feed line to the job may seem like the natural place to start, but the first step begins by matching the feed line to the press and the parts to be produced. In addition, careful consideration of existing feed equipment helps a company make a more efficient purchase. With this in mind, let's talk about the key elements affecting feedline selection and purchase.

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Cosmetic Parts, or Not?

A stamper needs to consider whether the press and feed line will be required to run highly cosmetic parts. These applications require power straighteners, capable of extremely gradual decelerations and accelerations that reduce the likelihood of creating burnish marks. In addition, during pauses in production, a power straightener with a slow-creep mode can reduce the number of times the material feed must stop and start. For noncosmetic applications, the stamper selects between a power straightener and a servo feed with a pull-through straightener.

While offering the most flexible arrangement, this conventional feed line also carries the highest cost and uses the most floor space.

Select the Right Feed Line

A stamper also must determine the range of material thickness to be run. Stamping material thinner than 0.060 in. requires a reel or horizontal pallet decoiler. A reel uses an arbor that inserts into the center of the coil and expands to support the material on the inside diameter. This arrangement prevents possible damage to the material. Coils of stock thinner than 0.060 in. and narrower than 3 in. wide also are good candidates for pallet decoilers. In fact, the narrower the strip, the more attractive a pallet decoiler becomes. The pallet decoiler allows staging or horizontal stacking of multiple coils, making them easier to handle.

Running material thicker than 0.060 in., the stamper can opt for a reel, horizontal pallet decoiler or a cradle. Thicker materials in narrow strip can be run on some pallet decoilers and reels, but feed lines for these applications can require addition of expensive options.

Cradles, which run very wide as well as narrow coils, offer the most cost-effective choice for heavy-gauge material in widths to 3 in. When stamping material thicker than 0.080 in., operator safety becomes more of an issue due to the added danger from unbanding the coil. Stampers should not underestimate the amount of energy stored in a wrapped coil. Options to enhance safety and improve setup efficiency include coil holddowns, peelers, threaders and debenders. It is costlier, due to the number of options needed, to run heavier material on a pallet decoiler or reel. Cradles are the most cost-effective feed-line choice for applications dedicated specifically to heavy-gauge non-cosmetic work.

Coil Weight (lb.) Chart

Based on 20-in. Coil ID

Coil width, in.	Coil OD, in.								
	36	42	48	54	60	66	72	78	84
12	2,300	3,500	4,900	6,500	8,300	10,200	12,600	14,800	17,800
18	3,400	5,200	7,400	9,700	12,400	15,300	19,000	22,200	26,600
24	4,600	7,000	9,800	13,000	16,000	20,400	25,200	29,600	35,500
30	5,700	8,700	12,300	16,200	20,700	25,500	31,500	37,700	44,400
36	6,800	10,400	14,800	19,400	24,800	30,600	37,800	44,500	53,300
42	8,000	12,200	17,200	22,700	29,000	35,700	44,100	51,900	62,200
48	9,100	13,900	19,700	25,900	33,100	40,800	50,400	59,300	71,000
54	10,300	15,700	22,100	29,200	37,300	45,900	56,700	66,700	79,900
60	11,400	17,400	24,600	32,400	41,400	51,000	63,000	74,100	88,800
66	12,500	19,100	27,100	35,600	45,500	56,100	69,300	81,500	97,700
72	13,700	20,900	29,500	38,900	49,700	61,200	75,600	88,900	106,600
78	14,800	22,600	32,000	42,100	53,800	66,300	81,900	96,300	115,400
84	16,000	24,400	34,400	45,400	58,000	71,400	88,200	103,700	124,300
90	17,100	26,100	36,900	48,600	62,100	76,500	94,500	111,200	133,200
96	18,200	27,800	39,400	51,800	66,200	81,600	100,800	118,600	142,100
Coil weight per inch of width	190	290	410	540	690	850	1050	1235	1480

Approx. Sheet Steel Thickness	0.2391	0.2242	0.2092	0.1943	0.1793	0.1644	0.1495	0.1345	0.1196	0.1046	0.0897	0.0747	0.0673	0.0598	0.0538	0.0478	0.0418	0.0359	0.0329	0.0299	0.0269	0.0239	0.0209	0.0179	0.0164	0.0149	0.0135	0.0120	0.0105	0.0097	0.0090	0.0082	0.0075	0.0067	0.0064	0.0060
Gauge No.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38

Larger coil sizes means dramatic weight increases.

Stock Width, Thickness and Feed Length

By looking at both the width and gauge of material to be used, a stamper can ensure the profit-generating ability of a press is not restricted. The widest material a stamper may run through the press should dictate the width of the feed line, and the tonnage capacity of the press tells the stamper how to specify the feed line. Stampers purchasing a feed line for a dedicated production cell and specific part runs are an exception to this approach.

A stamper also must consider the longest feed lengths and required stroke rate. Each feed line has a speed range for optimum operation. While some adjustments can be made to allow a feed line to drop below optimum speed, adjustments cannot be made that cause the feed line to run faster. Since the stamper will actually have to specify a speed range capable of handling all potential work to be performed on the press, this is an important factor to evaluate before making a purchase.

Stampers with high-volume jobs requiring multiple coils for a single setup should consider feed-line options that reduce the total number of coils required. For a slightly larger investment, a stamper can specify an option that allows larger outside diameter (OD) coils to be run. This option can reduce the overall number of coils needed by as much as 50 percent. Running fewer, larger coils optimizes efficiency and can help avoid potential die crashes by reducing the number of times a die must be set up with a new coil.

Aside from running fewer coils, the stamper also will want to consider feed-line features that reduce changeover time. Load carts and dual reels can help stage coils for efficient setup. Other options quicken thread-up. And inline coil joining, where the end of one coil welds to the leading edge of the next coil, works well in setups requiring several coils.

Finally, stampers must look at the pressroom's material-handling capacity when considering using larger-OD coils—forklifts and other equipment (See the Coil Weight Chart above).

Flatness, Floor Space

Another factor influencing feed-line selection is how flat the material must be as it enters the die. For example, in a

Cradle feed lines minimize cost and use less floor space than conventional lines, but are less flexible.

progressive die that repeatedly draws and forms the material, the incoming strip often doesn't need to be very flat to produce a good part. In cases where part quality is greatly affected by the flatness of material entering the die, stampers must pay careful attention to the number of straightening rolls used, their diameter and spacing in relation to one another, and the thickness of the material being straightened. In applications where the incoming strip must be extremely flat, a leveler may be required instead of a straightener.

Another consideration is how much floor space a stamper has to accommodate a new feed line. A conventional feed line with pull-off reel, powered straightener and servo feed, set up to run material 0.25 in. or thicker, can stretch to 40 ft. long. A space-saving line using a servo feed with a pull-through straightener and a reel set up for that same material can fit in a space less than 25 ft. long, however it cannot accommodate cosmetic parts. Similar in length would be a line comprised of a servo feed with pull-through straightener and a cradle. This lower-priced configuration also cannot run cosmetic jobs, nor can it run material thinner than 0.060 in.

In summary, a conventional feed line with pull-off reel, powered straightener and servo feed is the most flexible arrangement but carries the highest pricetag and consumes the most floor space. Feed lines equipped with servo feeds and pull-through straighteners cost less and use less floor space, but lack the ability to run cosmetic parts.

Complementary Considerations

Finally, stampers need to look closely at their inventory of existing equipment and systems and make sure that new feed lines would complement their capabilities. For example, if a pressroom contains a 600-ton press with a feed line set up for cosmetic work, does the company really need a second duplicate feed line? If work can be scheduled for applications that need specified equipment, the stamper can consider feed-line alternatives that save capital equipment dollars and consume less floor space. Conversely, a stamper with no existing feed lines should strongly consider investing the extra dollars to buy the most flexible feed line possible, even if capabilities exceed current work requirements.

With these guidelines in hand, a stamper can make a more informed purchase choice that will have a direct impact on productivity and bottom-line profitability. These equipment choices also can mean the difference in a manufacturer's ability to remain competitive in today's changing marketplace. **MF**