An inside look at how large coils of flat steel become uniform pieces of metal deck.

How Metal Deck is Made

Ever wonder how metal deck achieves its fluted form? Producing metal deck is a fairly simple, albeit precise, process. The below photos walk you through a typical deck job at the CMC Deck facility in Peru, Ill. The series shows the painting, roll-forming, and cutting of 48.25-in.-wide flat steel that ended up as 36.125-in.-wide metal deck. The finished product is generally shipped the next day, directly to the job site.
factured by U.S. Steel in Gary, Ind.—waiting
to be rolled into the final product. Quality
control for the steel is performed at the mill,
although CMC verifies that the lengths and
widths of the delivered bundles are correct.

Although cleaner and without a materi-
als yard, the metal deck operation is just as
loud as the others, especially thanks to the
machine cutting the steel. As such, ear pro-
tection is the rule, along with hard hats, eye
protection, and gloves.

Cutting Grooves

Both hot-dip galvanized and cold-rolled
(uncoated) materials are used to make metal
deck. The majority of uncoated material is
furnished to the end user with a shop coat
of primer. The process itself is fairly simple.
First comes the painting, for corrosion pro-
tection and aesthetic purposes. The painting
schedule is determined approximately two
weeks ahead of when the job is actually going
to be rolled. Steel to be painted—mostly for
roofing deck—is put through a long series of
painting machinery that somewhat resem-
bles a printing press. Three coats are applied
via rollers: a pretreatment that helps the paint
better adhere to the metal, a primer coat, and
a finish paint coat. Two colors are available—
gray (UL listed) and white primers—and any
combination of colors and sides is possible:
gray on one side, white on the other; gray
on both sides; white on one side, no paint on
the other; etc. After paint is applied, the steel
travels through heating ovens, which dry it,
then through a chilling unit before being
rolled up into a coil again.

From here, the steel is placed in inven-
tory, where it will stay for a day to two
weeks before being roll-formed. The roll-
forming process is what creates a finished
metal deck product. The Metform roll-
forming lines that CMC uses are roughly
100 ft long and can run 250 ft of steel per
minute with most products. A line con-
tains four sets of rafts, which are sets of
tooling rolls that create the width of the
deck and the flutes. The first raft creates
one flute down the middle of the steel,
drawing the metal inward. As the steel
travels down the line, each set of rafts cre-
ate more flutes, outward from the center.
At the end of the line, the steel is cut into
the exact lengths required for each order.
A worker controls the roll-forming line
from a nearby station at this end of the
machine, and another worker seated just
past the shear pulls each deck piece off the
line and places it into a stack as a finished
product.

As we watch the worker pile up section
after section of finished steel deck, Grant
explains that this step in the process isn’t

4 The first flute is made in the center
of the steel, drawing it inward.

5 As the steel travels down the
line, more and more flutes are
created from the center out.

6 At the end of the line, the
deck is cut with a shear
machine, then is stacked
and bundled, ready to
ship.
as easy as it looks. Each piece of deck can weigh as much as 350 lb, and stacking the pieces while getting the flutes to line up requires finesse. Grant says that the key is using the momentum of the steel as opposed to muscling it. The end result is a short, neat stack of deck, perfectly lined up, bundled, and ready to be shipped. Six loading docks provide trucks with direct access to the finished products.

A Good Gauge

The majority of the steel rolled at the Peru facility is 0.028-in.-thick (22-gauge) steel that starts out at 48.25 in. wide and ends up at 36.125 in wide, although the plant is capable of working with gauges of up to 16. The rafts are removable and can be switched out to accommodate deck products of different numbers, widths, and depths of flutes. It takes about 45 minutes to change all the rafts on a line.

The facility has four roll-forming lines, three for its standard roof and flooring projects and one cell deck line for specialty products. This specialty line generally rolls a thicker gauge of steel, much of which is perforated and has an insulation bat installed in it for soundproofing purposes. The bulk of the deck produced from this specialty line is used in gymnasiums, cafeterias, and other school areas. This machine generally rolls far less steel per minute than the three main lines, and product created on this machine tends to stack much higher.

There are also machines that produce “accessory” products: end caps, flashings, etc., which are used to close in the ends of the decks at the edges and corners during installation. Grant also says that his facility has the capability to produce special accessory items as needed.

Room to Grow

The Peru facility employs 55, including 12 detailers. Grant notes that CMC is committed to hiring locally, and all but a handful of the employees are from the area. He explains that employees are cross-trained for various tasks (meaning that the worker stacking the steel deck at the end of the roll-forming line doesn’t have to do that all the time). All production is performed during one shift, but Grant anticipates that business will increase enough to warrant a second shift some day.

And things are looking good. The Peru facility is capable of using 75,000 tons of steel per year, and last year’s production was up from the year before.