



Dummy Stamps Study Group

Discovery of “Star-Spangled Banner” Linerless Self-Adhesive Test Coil Stamp

By **Richard J. Nazar**

USSS #11033, 65 Windsor Way, Berkeley Heights, NJ 07922-1858
<Richard.Nazar@USAstamps.com>

A new test coil stamp has been found that identifies a transitional step in the evolutionary development of self-adhesive coil stamps for the United States Postal Service (USPS); see Figure 1. The new test stamp appears to be an experimental hybrid of leading edge stamp technology and traditional postage stamp characteristics. The new test coil stamp is a linerless self-adhesive coil with round-hole perforations between the stamps.



Figure 1. Newly reported linerless self-adhesive test coil stamp with round-hole perforations. (Image shows unused self-adhesive stamps on non-stick backing paper, which is not original for the issue.)

To date, a very small quantity of these “Star-Spangled Banner” linerless self-adhesive test stamps are known to have been recovered by collectors, and only a small amount of information has been uncovered about the stamp’s production origins and use. This article will outline what is currently known — and hopefully will lay the groundwork for additional research about this stamp.

Linerless self-adhesive coil stamps are similar to typical self-adhesive coil stamps, but a roll of linerless coil stamps does not have a ribbon of



Figure 2. Strips of the four linerless coil stamps issued by the USPS; top to bottom: Scott #3132, 3133, 3404-3407 and 3680-83.

backing paper (or “liner”) on the adhesive side of the stamps. A liner is required on typical self-adhesive coil stamps to prevent the stamps in the roll from sticking to the layer of stamps below them. However, on linerless self-adhesive coil stamps, the top surface of the printed side of the stamps is coated with a clear “release layer” that allows the stamps to have enough stickiness to stay in a coil, but still allows the top stamp on the end of the roll to be removed easily from the roll without disturbing the image or paper surface of the stamps below it. Linerless self-adhesive coil stamps, therefore, function similarly to a roll of adhesive tape.

The USPS has released only four postage stamp issues in the linerless self-adhesive coil format, primarily on an experimental or limited basis (Figure 2). The four issues are:

- Presorted First Class (25¢) Juke Box produced by 3M Corporation (printed by Stamp Venturers) in imperforate coils of 10,000 and 30,000 stamps, issued on March 14, 1997 (Scott #3132)

- 32¢ Flag over Porch produced by 3M Corporation (printed by Stamp Venturers) in coils of 100 stamps with serpentine die cuts, issued on March 14, 1997 (Scott #3133)
- 33¢ Fruits and Berries produced by Guilford Gravure in coils of 100 stamps with serpentine die cuts, issued on June 16, 2000 (Scott #3404-3407)
- 37¢ Snowmen produced by Guilford Gravure in coils of 100 stamps with serpentine die cuts, issued on October 28, 2002 (Scott #3680-83)

The only other stamps reported by collectors in the linerless self-adhesive coil format are test stamps or promotional stamps from private printers (Figure 3). This small group is comprised of:

- 29¢ Blue Eagle with stricken value and “TEST SPECIMEN” produced by 3M Corporation (printed by National Label Co.) in imperforate coils of 3,000, 10,000 and 30,000 stamps (Scott #TD123)
- Non-denominated Mailbox produced by Avery-Dennison in coils of 50 stamps with small 1-2 mm die cuts at the left and right margins between stamps (Scott #TD132)
- Non-denominated Flag and Eagle over Trees produced by Sennett Security Products in coils of 100 stamps with serpentine die cuts between the stamps (promotional stamp—no Scott number assigned)

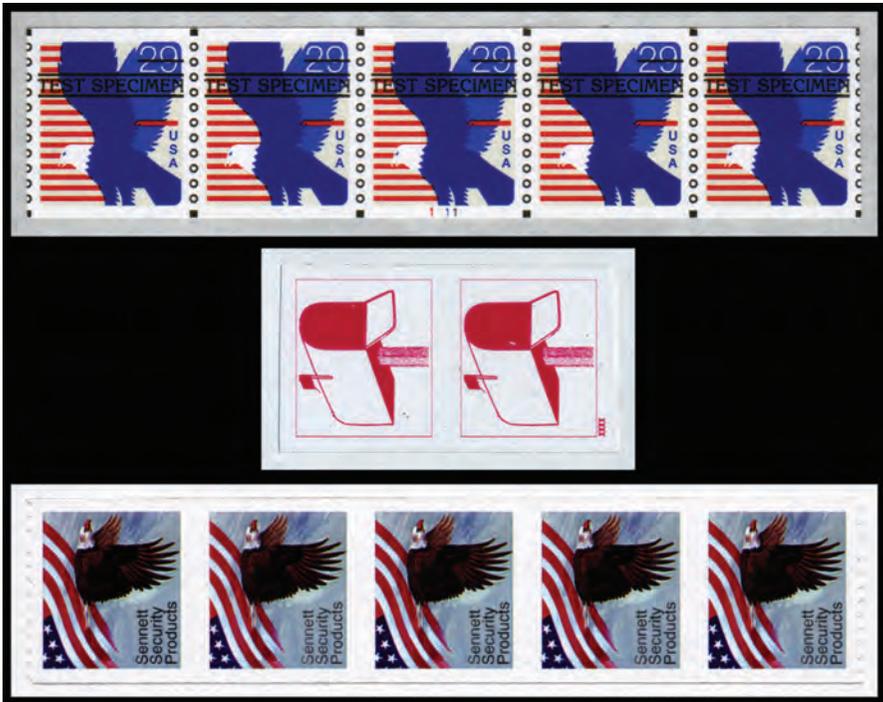


Figure 3. Strips of the only three linerless self-adhesive test stamps or promotional stamps reported by collectors prior to the discovery of the “Star-Spangled Banner” linerless test coil; top to bottom: Scott #TD123, TD132, and no Scott number assigned.

Design

The “Star-Spangled Banner” design of the newly discovered linerless self-adhesive test coil stamp is not unique to this stamp. Other stamps have used a similar design (Figure 4), which originated from the top portion of a patriotic woven ribbon/bookmark that was manufactured at the 1893 World’s Columbian Exposition by the Phoenix Silk Manufacturing Company of Paterson, New Jersey. (The lower portion of the ribbon includes the staff of music and the words to “The Star Spangled Banner.”) A more accurate rendition of the top of the original bookmark design was used for one of the stamps in the “Old Glory” prestige booklet issued by the USPS in 2003 (Scott #3778).



Figure 4. Stamps with similar designs based on the “Star-Spangled Banner” ribbon from the 1893 World’s Columbian Exposition. The new linerless self-adhesive test coil stamp (center) is shown with Scott #3778 (left) and TD130A (right).

The new linerless test coil stamp’s design more strongly resembles the design used for a previously reported self-adhesive test coil — Scott TD130A. However, differences exist in the printed images of the two test stamps.

Production

Because the new linerless self-adhesive stamp is a test stamp, no formal announcements were made by the USPS concerning its production or availability. However, evidence from several sources indicates that the “Star-Spangled Banner” test coil stamp was produced by the Bureau of Engraving and Printing (BEP) in 1998.

Copies of press logs (“Daily Production Equipment Operational Summary” forms) acquired from the BEP identify activity that likely documents the printing of the “Star-Spangled Banner” linerless test coil stamp on the BEP’s F Press.¹ The F Press (also identified as press “801” because of its location within the BEP annex building in Washington, DC) was a Goebel combination web press that had one three-color selective inking intaglio station (using one printing sleeve) and four single-color offset stations. The F Press was acquired by the BEP in 1991.

The BEP press activity report (Day Shift) for August 13, 1998, identifies the “Job Description” for the shift’s activity as “LINERLESS TEST” (Figure 5). The job “Order No.” on the report is “145-97 A12” (the “97” in the Order No. indicates that this order was received/initiated in 1997). The reports for the ensuing shifts (all of which are Day Shifts) through October 1, 1998 identify

BEP FORM 2137 REVISED EDITION 08/01/87										DAILY PRODUCTION EQUIPMENT OPERATIONAL SUMMARY	
SHIFT		DATE	OT HOURS	EQUIP NO.	COST CENTER	PRODUCT CODE	ORDER NO.	START TIME	JOB DESCRIPTION		
D E M		8/13/98		801	241060		146-97	630	LINERLESS TEST		
OPNS CODE	STOP TIME	QUAN. SHEETS/ PKGS/LOAD NO.	REMARKS								
17	855		CLEAN-UP WEB PATH OF ALL TRASH FROM COILING WORK								
25	1200										
16	1210										
152	1240		CHANGE WEB PATH TO INCLUDE INTAGLIO GREN AFTER FIRST GOING THROUGH PHOSPHOR UNIT								
25	215										
15	330		FM → WORKING ON WEB ROLLER								
			INSTALL & SEAL NEW 'DAB' ON PHOSPHOR UNIT								
			PLUMBER (2X) CLOSE OFF AIR LINE / FIX BREAK								
			PHOSPHOR GREN WORKING								
			INTAGLIO GREN NOT WORKING								
			EM								
ENDING REGISTER NO.											
STARTING REGISTER NO.											
SIGNATURE FOREPERSON		TOTAL PRODUCTION	CODE	NAME OPERATING PERSONNEL		CODE	NAME OPERATING PERSONNEL				
				OLEARY							
				DRUGMAN							

Figure 5. BEP Form 2137 (Daily Production Equipment Operational Summary) from August 13, 1998, showing production information the “LINERLESS TEST” stamp.

work with the following “Job Descriptions”: “LINERLESS COIL TEST,” “LINERLESS COIL” and “Linerless Release Coat Testing.” No additional references to any “linerless” production appeared in any of the reports past the October 1, 1998 record.

Support for the conclusion that BEP produced this linerless test coil stamp is found in the June 10, 1998 issue of *Commerce Business Daily*, which stated, “The Bureau of Engraving and Printing (BEP) has issued a purchase order to FLEXcon Company, Inc. to perform services for the development and application of special coating materials for linerless coil stamps.”²

Hallie Brooker, Lead Curator at the Historical Resource Center of the BEP, was contacted for additional information regarding this stamp, but she was only able to find smear test results from earlier in 1998 for samples of the printed web for a “Star-Spangled Banner” coil stamp (Figure 6).³ The test results samples included a March 17, 1998 cover letter from Sammy J. Seals, USPS Manager Test and Evaluation, to Cathy Caggiano, USPS Manager Stamp Acquisition. The subject line of the letter was “Sutherland Rub Test on (BEP) Stamp Paper,” and the body contained the following text:

Per your request, Test and Evaluation has completed the Sutherland rub test on the two printed sheets from the Bureau of Engraving and Printing that was submitted by you. A dry and wet ink rub test was performed using the Sutherland rub tester as per Tappi UM592. The dry rub test was performed with ten strokes and a four (4) lb. test block, a heavy color transfer was seen on the rubbing surface strip. The wet rub test was performed with a two (2) lb. test block one stroke



Figure 6. Samples from the Sutherland Rub Test results showing ink transfer from portions of the printed web of “Star-Spangled Banner” test coil stamps to different types of paper.

rub till the sample showed color transfer which was (between five and seven strokes). The test strips and the test samples are enclosed for ready reference.

The information in the smear test results letter and the attached test samples do not specify if this test was performed on printed web samples for the “Star-Spangled Banner” linerless self-adhesive test coil stamp, but the test samples (as shown in Figure 6) clearly contain the same plate markings and plate number configuration as seen on the newly-reported “Star-Spangled Banner” linerless test coil stamps.

Plate Numbers

The plate number (or “cylinder combination”) that appears on the “Star-Spangled Banner” linerless test coil is comprised of five digits — 11111 (Figure 7). Each digit is printed by one of the individual printing cylinders that applied the specific color of the five inks used in the design. The individual digits of the plate number are printed in the following colors (from left to right): magenta, yellow, cyan, blue, and black. Although no intact strip longer than 15 “Star-Spangled Banner” linerless test coil stamps has been inspected by researchers, the plate number would probably appear at 24-stamp intervals throughout the coil, which is the circumference of an offset printing cylinder on the BEP’s F Press.

When viewed under magnification (Figure 7), the printed digits of the plate number reveal a surprising artifact of the process used to print the “Star-Spangled Banner” linerless test coil stamp. The first three digits (magenta, yellow, and cyan) and the fifth digit (black) of the plate number appear as vertical blobs comprised of blurred dots of ink typical of offset printing. The

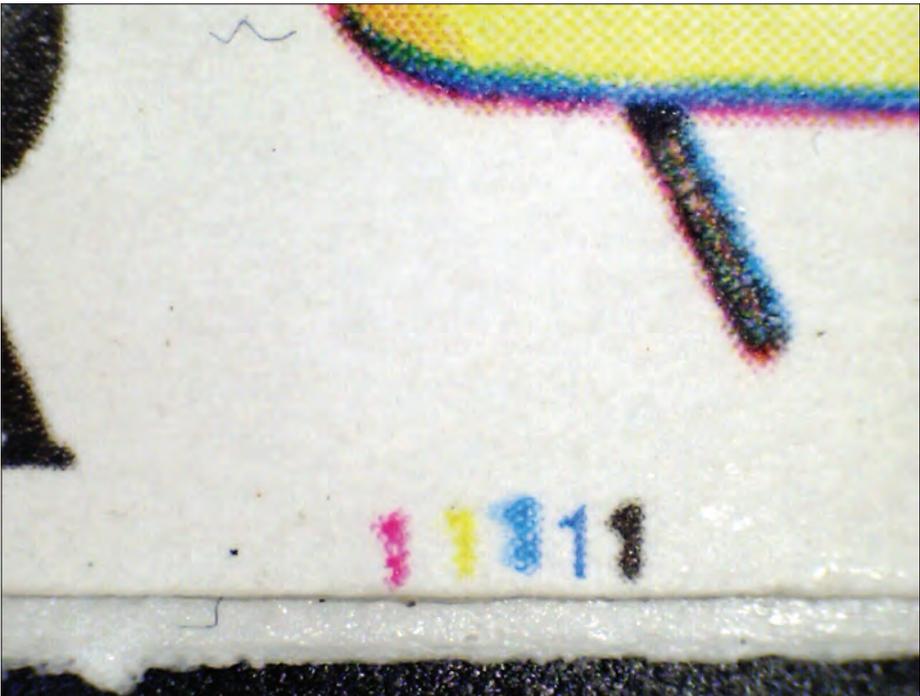


Figure 7. Five-digit sleeve combination (plate number) of the “Star-Spangled Banner” linerless test coil.

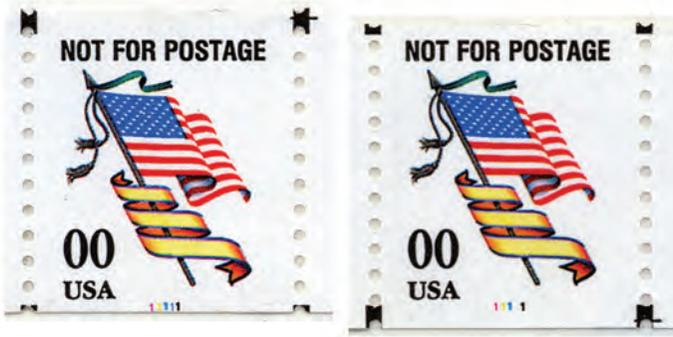


Figure 8. “Star-Spangled Banner” linerless test coil stamp showing the normal 5-digit plate number (left) and a less common 4-digit plate number example missing the intaglio blue “1” (right).

fourth digit (blue), however, is a more uniformly shaped “1” (although not line-engraved). The blue “1” of the plate number, which is from the same printing surface that printed the blue in the field of stars of the flag, appears to have been printed using a chemically-etched printing surface in the intaglio station of the BEP’s F Press. The other four colors (magenta, yellow, cyan, and black) were printed using the four offset stations of the F Press.

Although most of the reported “Star-Spangled Banner” linerless test coil stamps that show the plate number have a five-digit plate number as described above, some of these stamps only show a four-digit plate number because the blue “1” that was supposed to be printed by the intaglio printing sleeve is not present (Figure 8). Despite the lack of the intaglio blue “1” in the four-digit plate number examples, all of the intended ink colors are present in the rest of the printed stamp image. The reason for the absence of the blue intaglio “1” is not known, but it is possible that the digit was not engraved into one or more of the rows in the multi-row cylindrical intaglio printing surface.

Some examples of the “Star-Spangled Banner” linerless test coil stamps show the multi-digit plate number at the top of the stamp instead of the normal position at the bottom of the stamp (Figure 9). These examples were slit in



Figure 9. An improperly slit coil produced some “Star-Spangled Banner” linerless test coil stamps with the full 5-digit plate number at the top of the stamp instead of the normal location below the stamp design.



Figure 10. Full rectangular cutting guide mark with horizontal slitting guideline on the right side of the stamp showing the plate number.

the wrong location when the printed web was being sliced into individual coils. This variety is produced when the printed web wanders slightly from side to side in relation to the slitting knives of the coil processing machine. Sometimes this produces coil stamps showing the plate number at the top or split in varying degrees between the top and bottom of the stamp.

Cutting Guide Marks

The other noteworthy markings that appear on the “Star-Spangled Banner” linerless test coil are rectangular solid black cutting guide marks, which are located between the stamps at the top and bottom of the perforations. Each full rectangle measures approximately 2.4 mm high x 1.2 mm wide, but the rectangles are typically cut during coil slicing so that portions appear at the top and bottom of the stamps (these marks are most apparent in Figures 1 and 6). The cutting guide mark to the right of the plate number also has a faint horizontal line extending to the left and right of the center of the black rectangle (Figure 10). The faint line may be a guideline for setting the slitting knives during the coiling process.

Similar cutting guide marks are only found on two other USA coil stamps: the Presorted First-Class (25¢) Juke Box produced in imperforate coils of 10,000 and 30,000 stamps (Figure 2) and the 29¢ Blue Eagle test stamp produced in imperforate coils of 3,000, 10,000 and 30,000 stamps (Figure 3). These large imperforate linerless coils were produced for mass mailers and required automated stamp affixing machines to cut the individual stamps from the coil as it affixed the stamp to the envelope.

On page 306 of the *Linn’s U.S. Stamp Yearbook 1997*, George Amick explains the purpose of the black boxes on the linerless Juke Box coil as follows:

Unlike the Flag over Porch coil, however, the Jukebox is imperforate. In place of holes or die-cut simulated perfs, the coil rolls have a vertical row of printed circles between each pair of stamps, to suggest “perforations.” The rolls were made for the automated stamp affixing machinery used by bulk mailers in which individual stamps are cut from the roll by a guillotine device. Rectangular black cutting guides are printed above and below each vertical row of printed “perfs” on a stamp roll. The machinery would read the location of the marks and cut along the circles, leaving semicircles to represent perforations and thin vertical lines at the corners.⁴

The “Star-Spangled Banner” linerless test coil stamps were from coils of 100 stamps, which is the size intended for household consumers and small



Figure 11. Full roll of 100 “Star-Spangled Banner” linerless self-adhesive stamps still sealed by the original white paper band, which was used by the BEP to seal rolls of 100 coil stamps of other stamps in the 1980s and 1990s.

businesses (Figure 11). The black cutting guide marks required for large stamp affixing machines are, therefore, not necessary on this coil stamp. The cutting guide marks may have been put on the printing surfaces with the expectation that these printing sleeves would be used to print large-sized coils of 3,000 stamps or more. If these printing sleeves were used for this purpose, no stamps with the same “Star-Spangled Banner” image from large rolls have been reported by collectors.

Perforations

One of the most puzzling aspects of the “Star-Spangled Banner” linerless test stamp is the vertical perforations. To date, the “Star-Spangled Banner” linerless test stamp is the only reported USA self-adhesive stamp with traditional, round-hole perforations. All other USA self-adhesive stamps have die cutting (in a serpentine pattern to simulate torn perforations on the separated stamps to aid in the separation of the individual stamps) or are imperforate.

The perforations measure the typical gauge 9.8 for coil stamps with water-activated gum during this period, but no other self-adhesive stamp employs traditional perforation holes as a separation method. This typical stamp feature is abnormal for self-adhesive stamps. This oddity, however, has a curious visual relationship to the printed outlines of perforation holes on the linerless Presorted First-Class (25¢) Juke Box coil stamps (Figure 2) and the linerless 29¢ Blue Eagle test coil stamps (Figure 3). These two imperforate linerless stamps with the printed *faux* perforations also show the black cutting guide marks at the top and bottom of the vertical perforations.

During a private tour of the BEP’s coil processing area on September 25, 1997, Larry Graves (BEP) explained to Alan Thomson, a philatelic researcher/writer, that separate machinery to process linerless coils was being installed and could be in use as early 1998.⁵ Graves also said testing was happening during that time.

Adhesive

Most of the “Star-Spangled Banner” linerless test stamps show traces of adhesive extending into the perforation holes (Figure 12). This characteristic may indicate that the adhesive was applied to the back of the paper web after

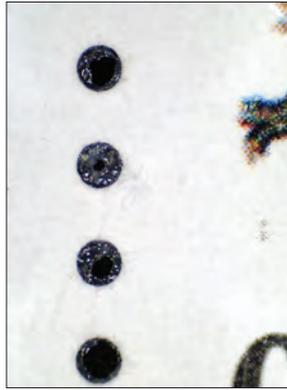


Figure 12. “Star-Spangled Banner” linerless test coil stamp perforation holes partially covered by the adhesive applied to the back of the stamps.

the stamp images were printed and the web was perforated. In contrast, most modern USA stamps, whether having water-activated gum (WAG) or pressure sensitive adhesive (PSA), have been printed on pre-gummed paper.

Tagging

When the “Star-Spangled Banner” linerless test stamps are exposed to shortwave (200-300 nanometers) ultraviolet light, the entire surface of the stamps glows yellow-green (Figure 13). This bright color is the luminescence of an overall taggant applied to the surface of the stamp, which is invisible in normal light.



Figure 13. The overall tagging of a “Star-Spangled Banner” linerless test coil stamp glows yellow-green when exposed to shortwave ultraviolet light.

Currently, it is not known if “Star-Spangled Banner” linerless test stamps were used in the mail stream for official testing purposes.

Offset Color Control Bars and Screen Density Blocks Instead of Stamps

Some examples of strips of this test stamp show a multi-color vertical color control bar comprised of several smaller boxes of offset ink colors (magenta, yellow, cyan, and black) instead of the “Star-Spangled Banner” stamp image (Figure 14). The small boxes of different ink colors, which help to manage the quality of the offset printing process, vary in pattern and density and sometimes overlap.

It is unknown why these ink boxes appear in the coil of stamps in place of the regular stamp image. Typically, color control bars like these appear in the selvage that is trimmed off the printed web during the coiling process or in the selvage that remains attached to one side of a sheet of offset-printed stamps. Like the interval of the plate number appearing throughout the roll, the stamp showing the vertical color control box will repeat throughout the roll at 24-stamp intervals. A long strip of stamps from a broken coil shows that the stamp with the offset color control bar is on the 12th stamp to the left or right of the stamp that shows the small plate number.

The presence of these color control bars in the coil of “Star-Spangled Banner” linerless test stamps indicates that this stamp was produced as a test of production methods more so than to create a product that would be used in testing coil dispensing equipment or mail handling equipment.

Plate Layout

The plate layout of the four offset plates and the one intaglio sleeve that printed the “Star-Spangled Banner” linerless test coil stamp is not currently known by philatelic researchers and collectors. We can, however, start to piece together the known press information and clues from the available strips in collectors’ hands and from images provided by the BEP from the Sutherland Rub Test results to get an understanding of a possible layout.

The size of the offset printing plates and intaglio sleeve is dictated by the press used to print the stamps. The BEP’s F Press had a maximum paper web width of 20 stamp rows. As mentioned previously, the circumference of an offset printing plate on the BEP’s F Press is 24 stamps. If the offset plate had the maximum number of rows (20), the offset plate wrapped around the printing cylinder would, therefore, yield 480 stamp impressions with each revolution (20 rows of 24 stamps around). Thus, the small plate number found on this coil issue repeats at 24-stamp intervals. Likewise, the offset color control bars (Figure 14) would also repeat at 24-stamp intervals throughout a full coil of 100 stamps.

The sample that was cut from the printed web and labeled “TEST #1” from the Sutherland Rub Test results (Figure 7) shows that the small plate number (11111) was repeated on each stamp in a single vertical column of the printing plate. In an arrangement similar to the small plate numbers, the multi-color offset color control bars that appear on this coil (Figure 14) were likely aligned in a single vertical column of the printing plate. It is also possible that each row of the printing plate included a distinctive multi-color offset color control bar. Eight distinctive examples are shown in the centers of the strips in Figures 14 and 15. A maximum of 20 distinctive multi-color offset color control bars — one for each row of the printing plate — may exist for the “Star-Spangled Banner” linerless test coil stamp.

Also, Figure 15 shows that some rows of the printing plates had large, stamp-sized screen density blocks to the left and right of the multicolor offset color control bars.⁶ In these rows, the fourth stamp to the left of the multi-color offset color control bars only has text that identifies the ink color and the “line screen” for the large screen density blocks that appear on either side of the stamp with the multi-color offset color control bar in that row. A “line screen” is the measure of how many halftone lines are printed in a linear inch.⁷ Halftone lines are comprised of small dots of ink of a single ink color. Larger ink dots produce a visual perception of a darker shade of the ink color. Smaller dots produce a lighter shade. This is evident in the

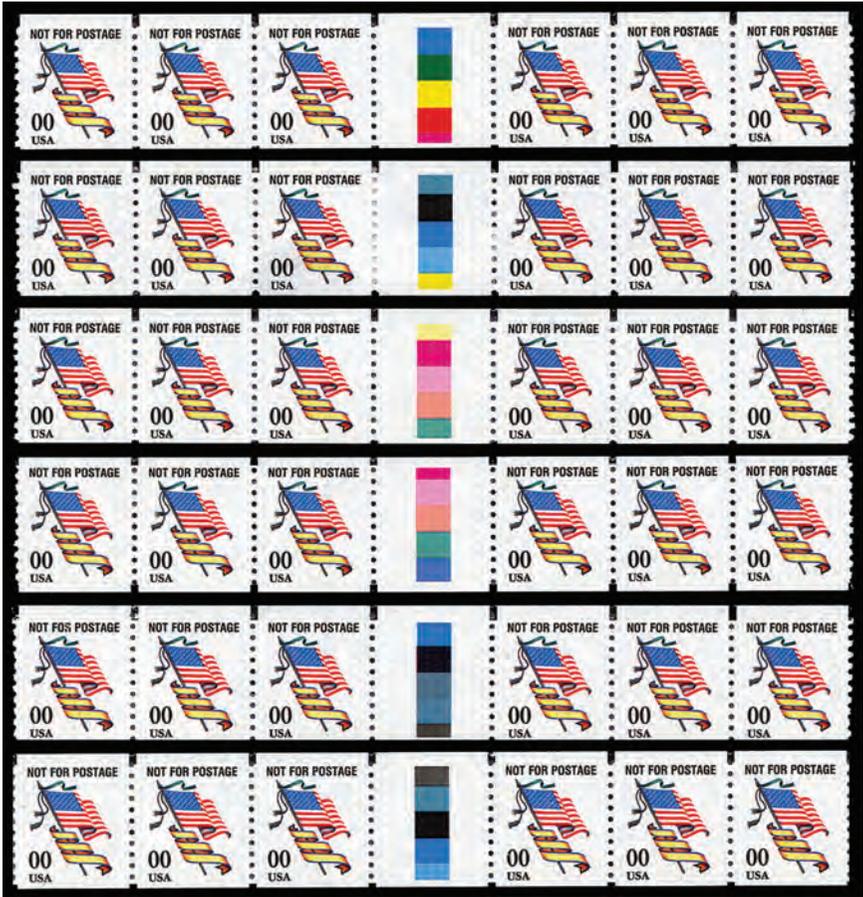


Figure 14. Strips of the “Star-Spangled Banner” linerless test coil stamps showing offset ink color control bars as one of the images in the coil.

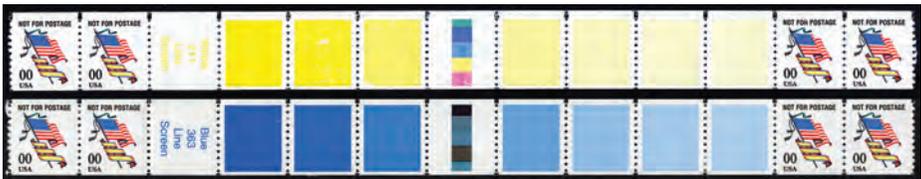


Figure 15. Strips of the “Star-Spangled Banner” linerless test coil stamps showing stamps with large screen density blocks of varying percentages instead of the “Star-Spangled Banner” stamp design in the roll of stamps.

variation of ink tints in the three stamps to the left of the multi-color offset control bar and the four stamps to the right.

A printed web sample shown in Figure 16 that is labeled “TEST #3” demonstrates that at least five rows of the printing plates had large screen density blocks instead of the “Star-Spangled Banner” stamp image. After the printed web was sliced into individual coils, this would have produced coils that had large screen density blocks from each of the five different ink



Figure 16. Sutherland Rub Test results shows large, stamp-sized screen density blocks instead of stamp images in portions of the printed web of “Star-Spangled Banner” test coil stamps.

colors (magenta, yellow, cyan, blue, or black) used to print the multi-color “Star-Spangled Banner” stamp image.

The strips of stamps shown in Figure 15 are from different coils. The top strip shows the yellow ink screen density blocks, and the bottom strip shows blue ink screen density blocks.

Varieties

Assuming that a stamp with the multi-color offset color control bar appeared in each row of the printing plate, and a 20-row plate was used, the printing of the “Star-Spangled Banner” linerless test coil stamp would have most likely produced the following 64 collectible face-different stamp varieties:

- Plain stamp
- Plate number stamp with 11111
- Plate number stamp with 111 1 (missing intaglio blue)
- Stamp with rectangular cutting guide mark showing the horizontal slitting guideline extending to the right of the rectangular cutting guide mark on the left side perforations. Depending on the top and bottom slicing of the coil, the horizontal line will show at the top or bottom left side of the stamp (stamp is located to the right of the plate number stamp).
- 20 stamps with distinctive multi-color offset color control bars
- 5 text stamps (one for each ink color)
- 35 stamps with large screen density blocks (seven blocks of varying tints for each of the five ink colors)

A Scott number has not yet been assigned to the “Star-Spangled Banner” linerless test coil stamp or any of the varieties listed above.

Acknowledgements

The author would like to cite the following people for their assistance and generous contributions of information, research, and philatelic material used in this article: Steven Blair, Hallie Brooker, Dave Cockrill, Cynthia Dutch, Stephen Hacker, Doug Iams, Sean Kennedy, Glenn Morgan, Michael Perry, Terry Scott and Alan Thomson.

References

1. Bureau of Engraving and Printing, “Daily Production Equipment Operational Summary,” BEP Form 2137 Rev. 4-89, (August 13, 1998 – October 1, 1998).
2. “AZ -- DEVELOPMENT PROJECT FOR LINERLESS COIL STAMPS,” *Commerce Business Daily*, June 10, 1998, PSA-2113.
3. Sammy J. Seals, USPS Manager, Test and Evaluation, “Sutherland Rub Test on (BEP) Stamp Paper Task No. 3611,” letter to Cathy Caggiano, USPS Manager, Stamp Acquisition, March 17, 1998.
4. George Amick, *Linn’s U.S. Stamp Yearbook 1997*, Linn’s Stamp News (1998), p. 306.
5. Alan Thomson, “Coil Processing At BEP,” *Coil Line*, Vol. 10, No. 12 (December 1, 1997), p. 174.
6. Printing Industry Exchange website (<http://www.printindustry.com/Glossary.aspx>), “Glossary of Printing & Graphic Terms.”
7. American Institute of Physics, Author Resource Center website (http://dx.aip.org/advisor/line_screen.html), “Halftones and Line Screens.”