Supporting Information for "Development of Self-folded Corrugated Structures Using Automatic Origami Technique by Inkjet Printing"

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Abstract

This Supporting Information includes:

Figure S1, S2, S3

Supplementary Videos

- Video S1: Process of self-folding of the SCS with 4 creases.
- Video S2: Process of self-folding of the SCS with 10 creases.
- Video S3: Demonstration of stacking SCS with 10 sheets of paper.
- Video S4: Three-point bending test of the SCS.

Figure S1

Measurement of the Young's modulus of paper. We conducted a total of three tests on 100 mm×15 mm size paper using a desktop type tensile and compression machine (A&D, MCT-1150). The test was conducted until the paper was torn. The load-deflection curves obtained from the three tests were converted to stress–strain curves, respectively, and the slope of the elastic region was derived by linear approximation. We defined the elastic region as the range of strain from 0 to 0.0025. (a) Photograph of tested environment. (b) An example result of the load-deflection curve. (c) The obtained elastic region and its slope. Young's modulus E of the paper used in this experiment was 5.32 Gpa. Results from three tests were averaged to obtain the final result.

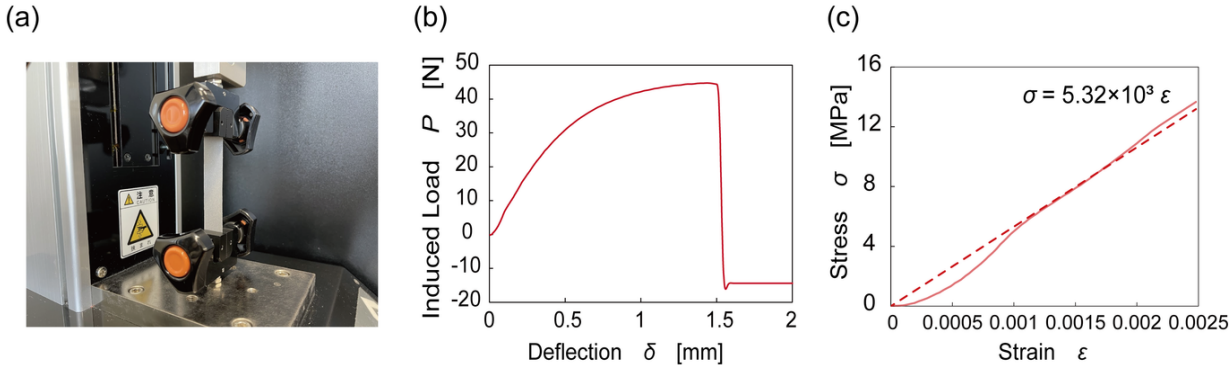


Figure S2

Three-point bending test results and second area moment results for the SCS with number of lines (a) $n = 6$ and (b) $n = 8$.

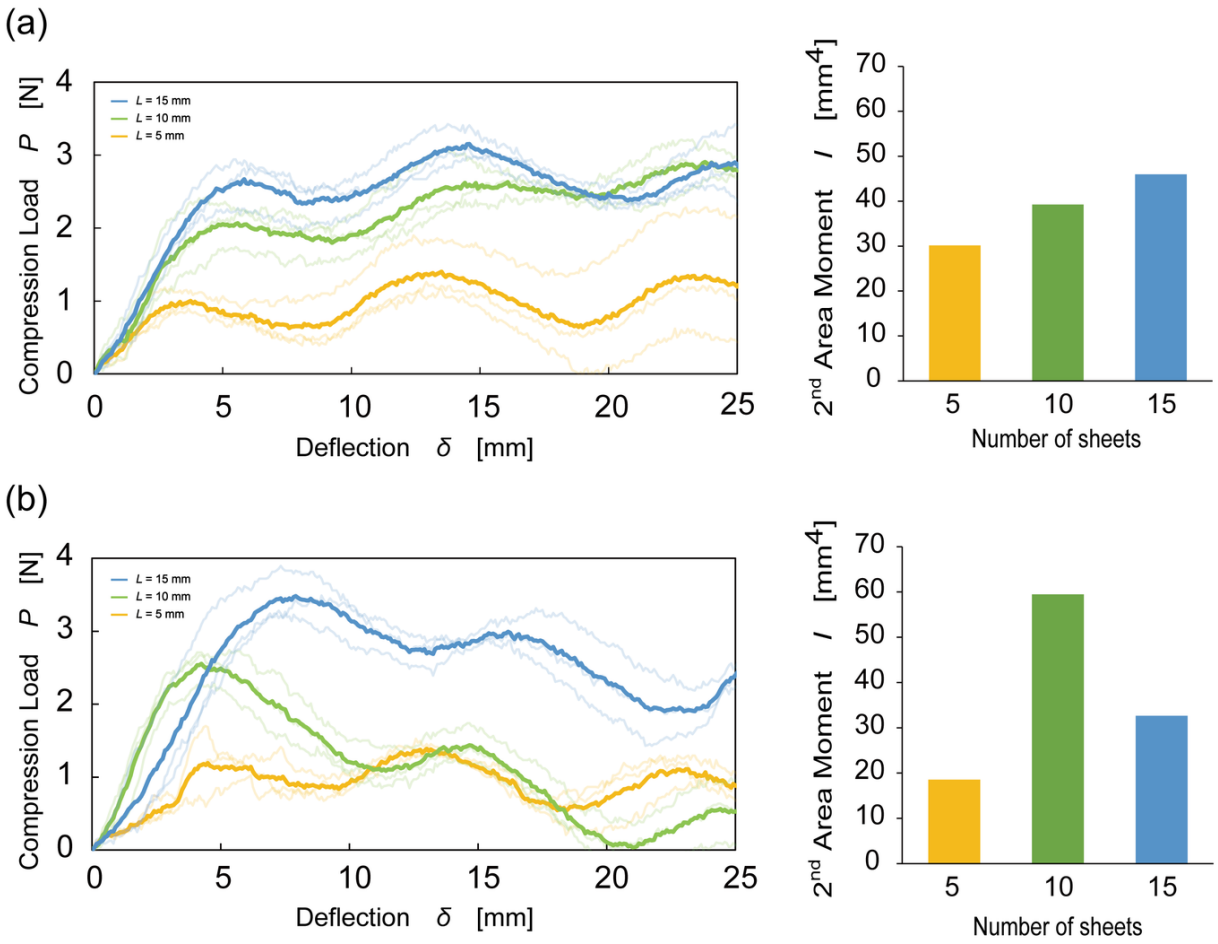
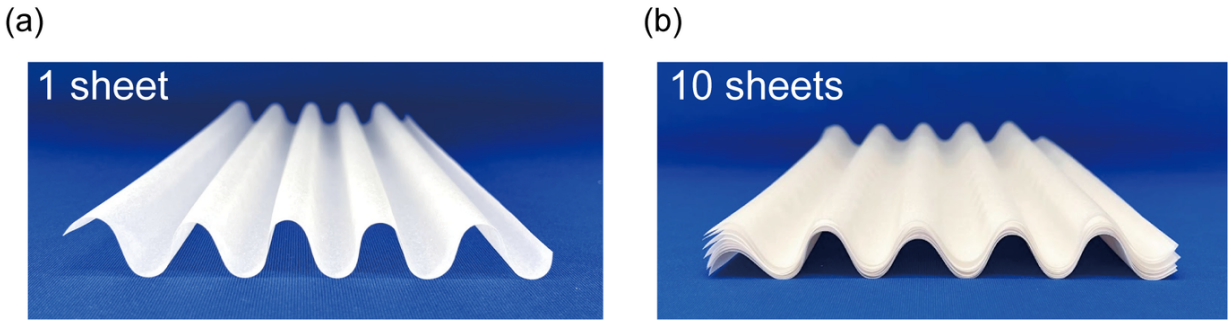


Figure S3

Stacked SCS. (a) One sheet of the SCS. (b) 10 sheets of the stacked SCS. As shown in (b), even 10 sheets can be stacked neatly without occupying much space because of the flexibility of the paper. The strength improves by 1461% in terms of the second area moment.



Video S1

Rich media available at https://youtu.be/khWODtu-12c

Video S2

Rich media available at https://youtu.be/0wW2qcU-YH4

Video S3

Rich media available at https://youtu.be/3kQbWAerjHk

Video S4

Rich media available at https://youtu.be/_3phQd0zrmk