USUAL WAYS OF MAKING WIREFRAMES ARE NOT SUITED TO DIGITAL FABRICATION

DIGITAL WIRE-BENDING IS FAST, INEXPENSIVE—AND WIRE IS STRONG.

DNA NANOSTRUCTURES TEACH A WAY TO MAKE FRAMES FROM DOUBLE HELICES...

...BUT, DOUBLE HELIX STRUCTURES ARE WEAKENED BY A SPLICE AT CENTER OF EACH STRUT.

SOLUTION: TRIPLE HELIX STRUCTURES CAN PLACE THEIR SPLICES AT THE ENDS OF THE STRUTS.

A TRIPLE COVER OF ANY ORIENTED MESH DECOMPOSES INTO ‘Z’S....

WHERE A ‘Z’ = CENTRAL COVER (BLACK) OF AN EDGE JOINED TO OUTBOARD COVER (GREEN) OF ITS 2 CLOCKWISE NEIGHBORS.

EDGELENGTH MUST BE AN ODD NUMBER OF HELICAL HALF-WAVELENGTHS SO THE TWO BENDS CAN BE CONGRUENT.

A PRECISE RATIO OF WAVELENGTH TO STRAND DIAMETER PREVENTS A TRIPLE HELIX FROM COMpressING/EXTENDING.

BUT I haven’T FOUND METALLIC WIRE THAT CAN WIND ON/OFF A LOCKED-UP TRIPLE HELIX WITHOUT DEFORMING....

...BUT UNPIGMENTED ABS FILAMENT CAN WIND ON/OFF A LOCKED UP TRIPLE HELIX IF IT HAS BEEN ANNEALED IN FINAL SHAPE.

ASSEMBLED ABS TRIPLE HELICES CAN BE DYED AND ANNEALED SIMULTANEOUSLY IN BOILING WATER.

References