

TRIANGLE CANE ROD BUILDING

Tapani Salmi

Finland

European Rod Makers Gathering

2013



TRIANGLE (TRI) ROD BUILDING SUMMARY:

- the physical properties of TRI are superior compared to six, five or four sided rods**
- possible to make long and light single and two hand rods with pleasant fishing properties**
- advantages of extreme hollow-building are easily obtained using standard hand tools**
- thick sections for two hand rods are obtained using normal cane thickness**



TRIANGLE ROD BUILDING SUMMARY:

Disadvantages:

- the unusual/strange outlook!
- no tapers available
- problems with handle, ferrule/joint, line guide geometry

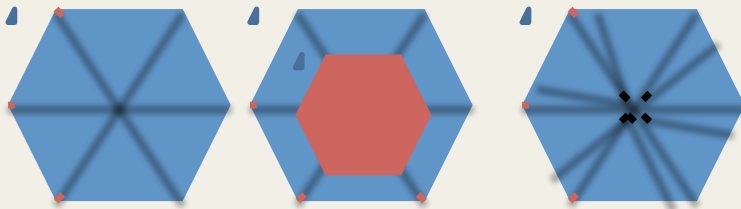


Tapani Salmi

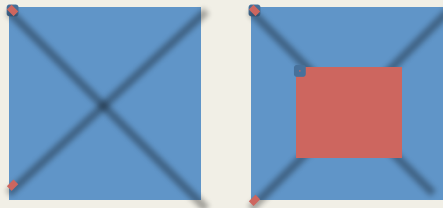
-Amateur rod maker since year 2000, no commercial interests

- <http://personal.inet.fi/private/tapani.salmi/>

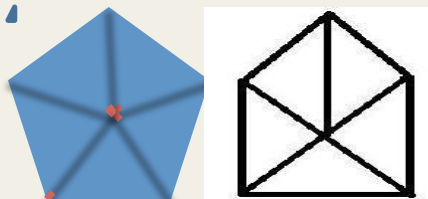
My previous experience:



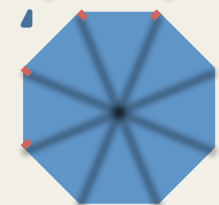
Hex
Hex hollow
Hex inside-out



Quad
Quad hollow

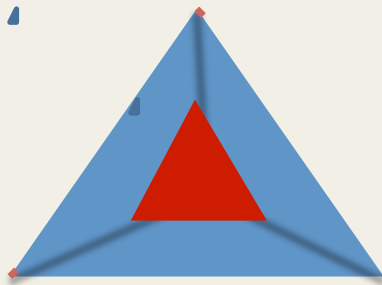
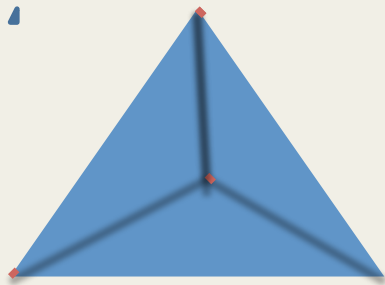


Penta,
QuadPenta

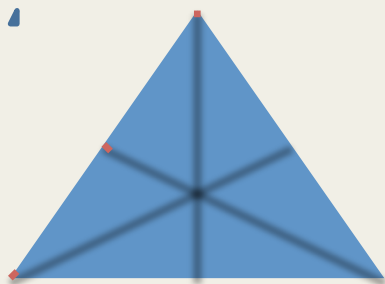


Octa inside-out

...and then something totally different...



**Triangle (TRI)
Three strips
Three strips hollow**



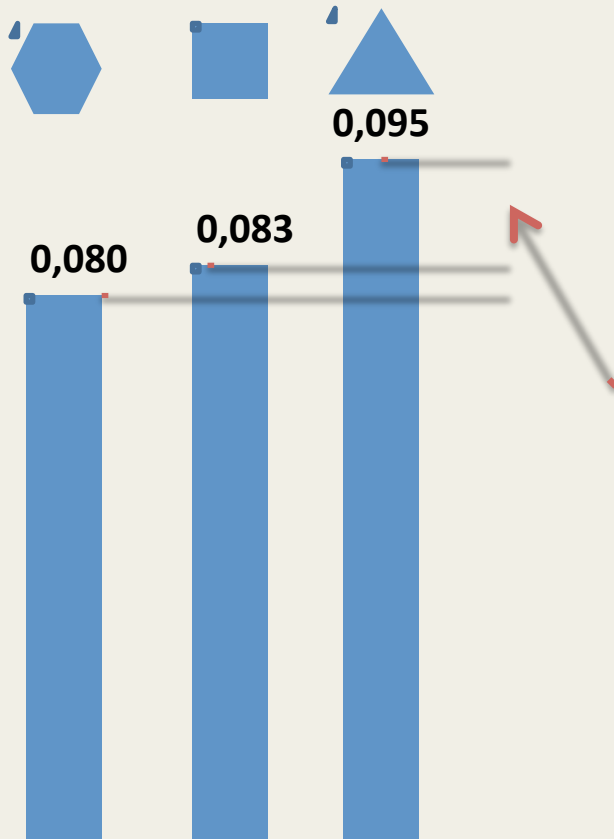
**Triangle TRISTAR
Six strips inside-out**



Egypt 2007: Papyrus reed in river Nile is triangle in cross section – I decided to try triangle building

WHY TO MAKE TRIANGLE TAPERS?

HEX QUAD TRI



Moment of Inertia MOI,
"stiffness of the rod" ,
when cross section

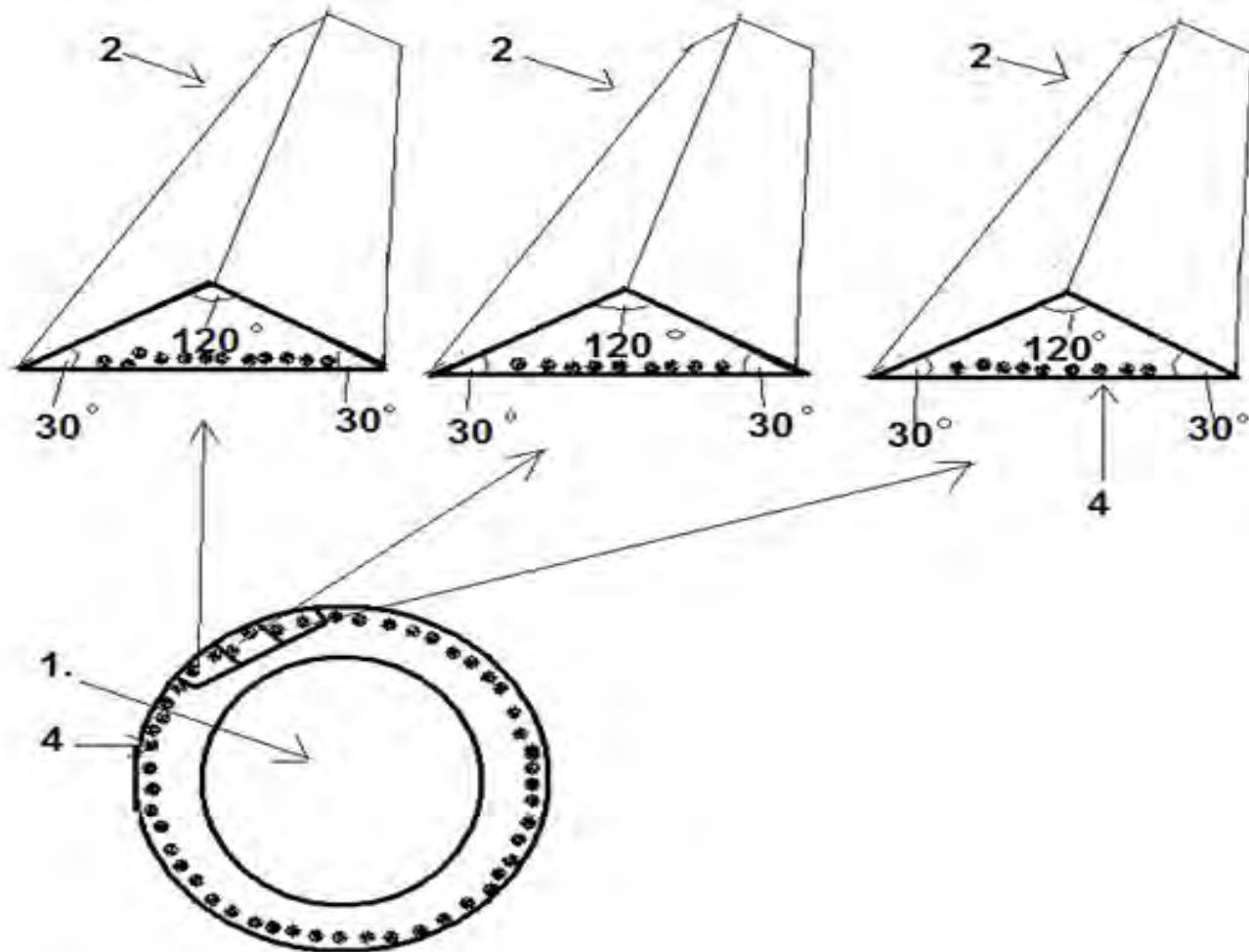
Area (mass) =1.0

**NOTE: difference
between HEX and TRI is
FOUR TIMES BIGGER
than HEX and QUAD**

"the nature if full of brilliant
mathematicians"

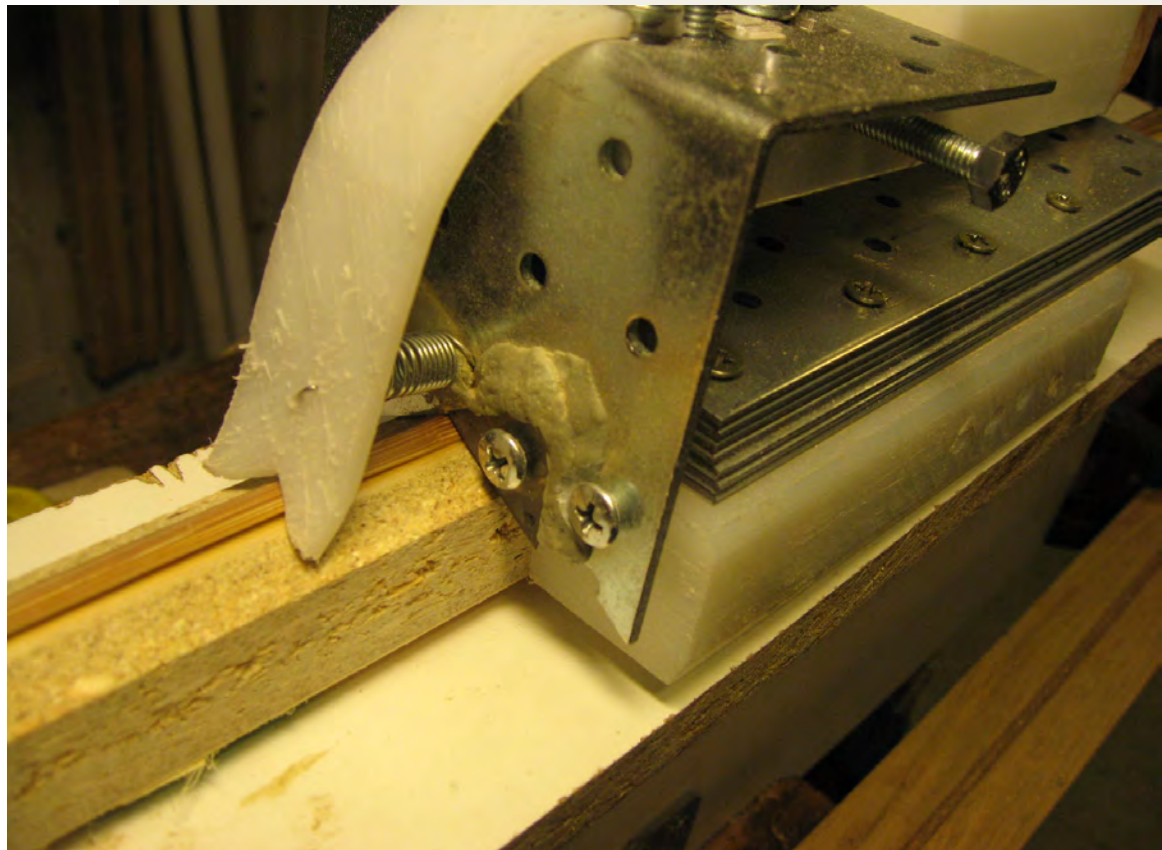
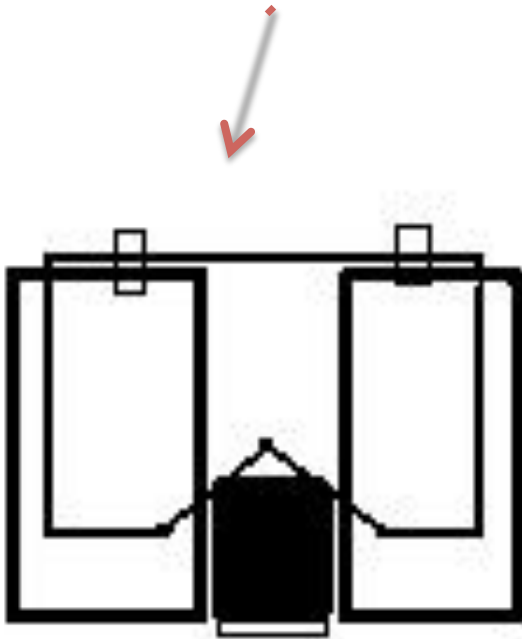
1. TRIANGLE ROD WITH THREE STRIPS

- The angles are 30° , 120° and 30°
- The strips are very wide (and very strong)



How to make 30-120-30 strips?

- Not too easy using hand tools
- soaked strips!
- 60-60-60 strips of proper size are converted into 30-120-30 strips
- simple hand mill

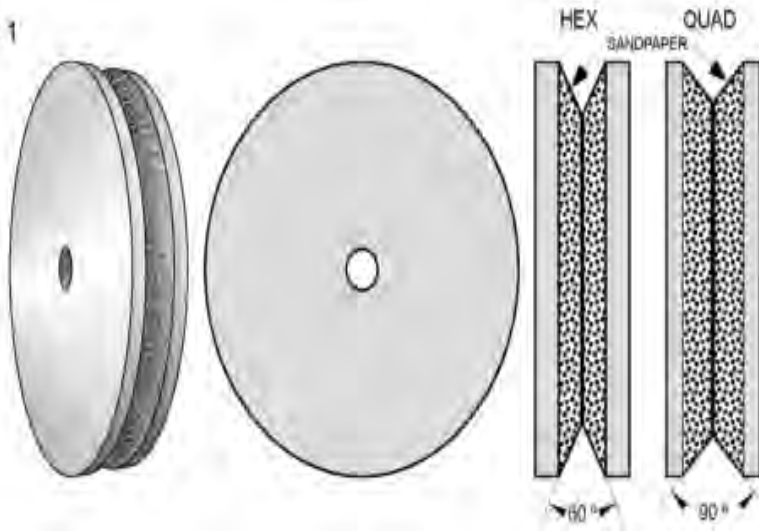


How to make 30-120-30 strips?

- Not too easy using hand tools
- soaked strips!
- 60-60-60 strips of proper size are converted into 30-120-30 strips
- hand mill
- Baginski beveler with 120° angle

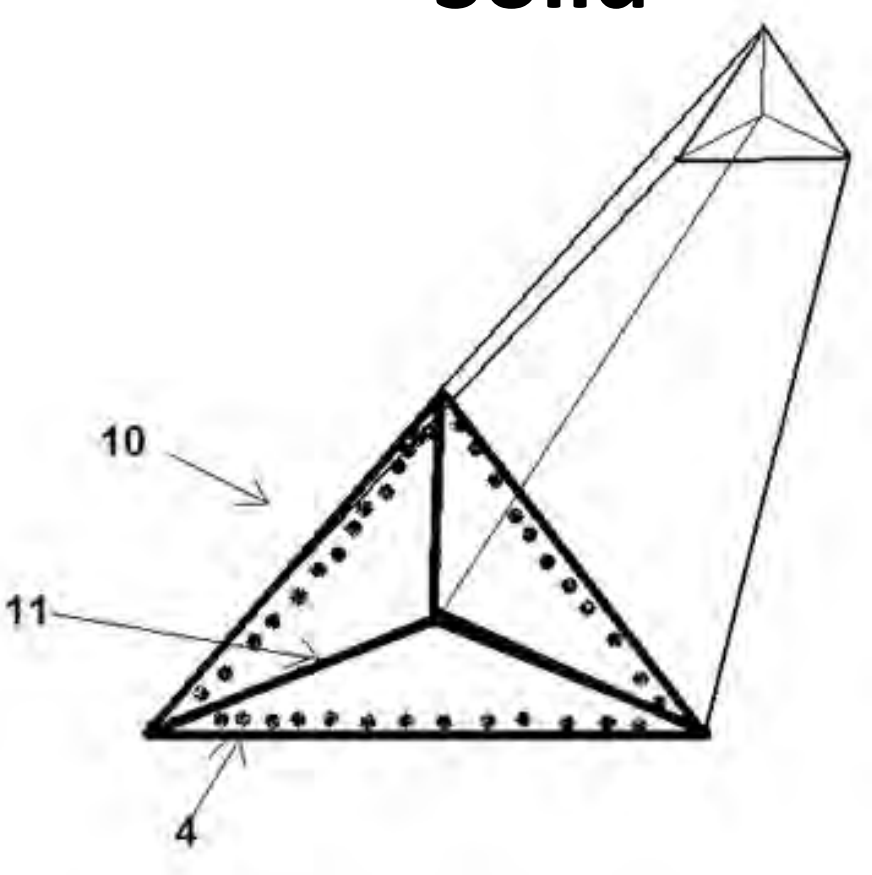


Figure 1

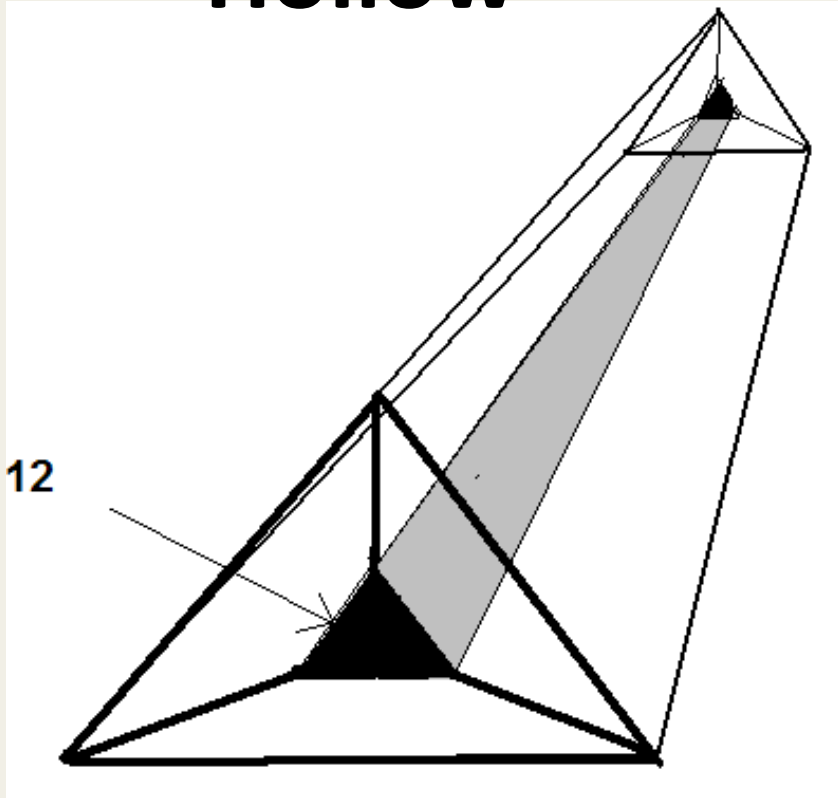


TRIANGLE THREE STRIP CONSTRUCTION

Solid



Hollow

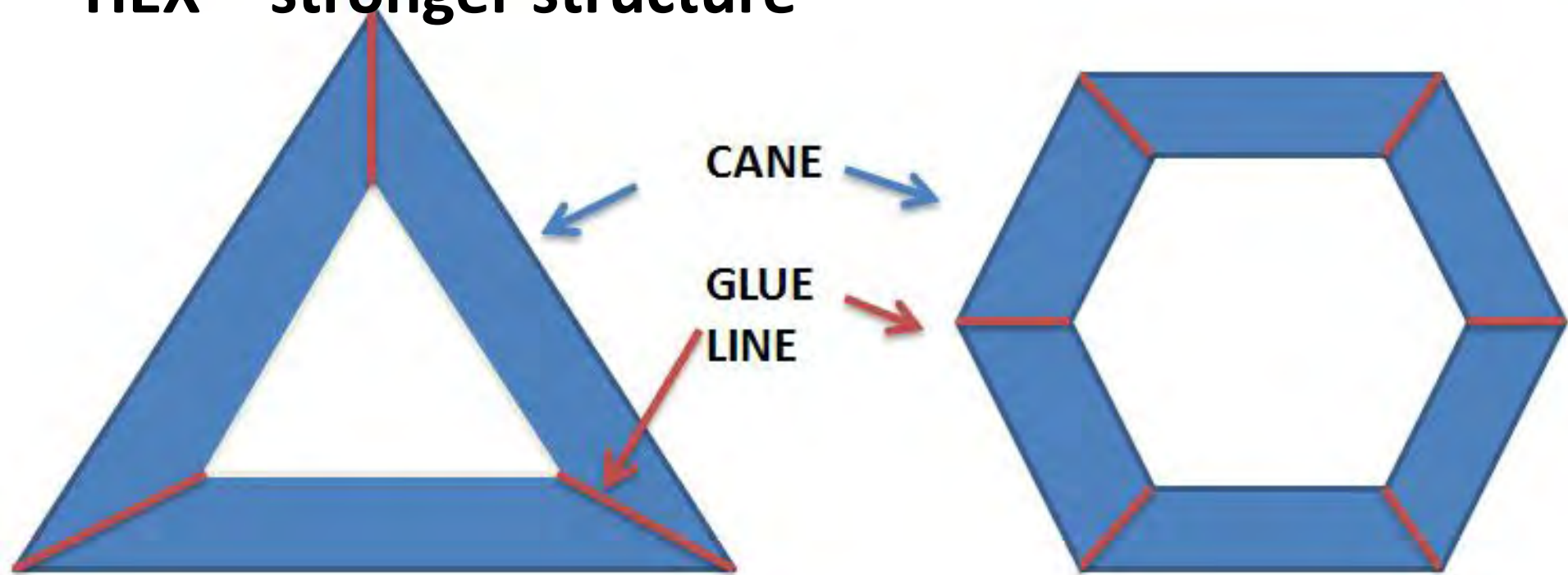


TRIANGLE hollow building

Advantages:

Possible to do big rods using only power fibres

The glue lines (red) are wider in TRI than in HEX - stronger structure

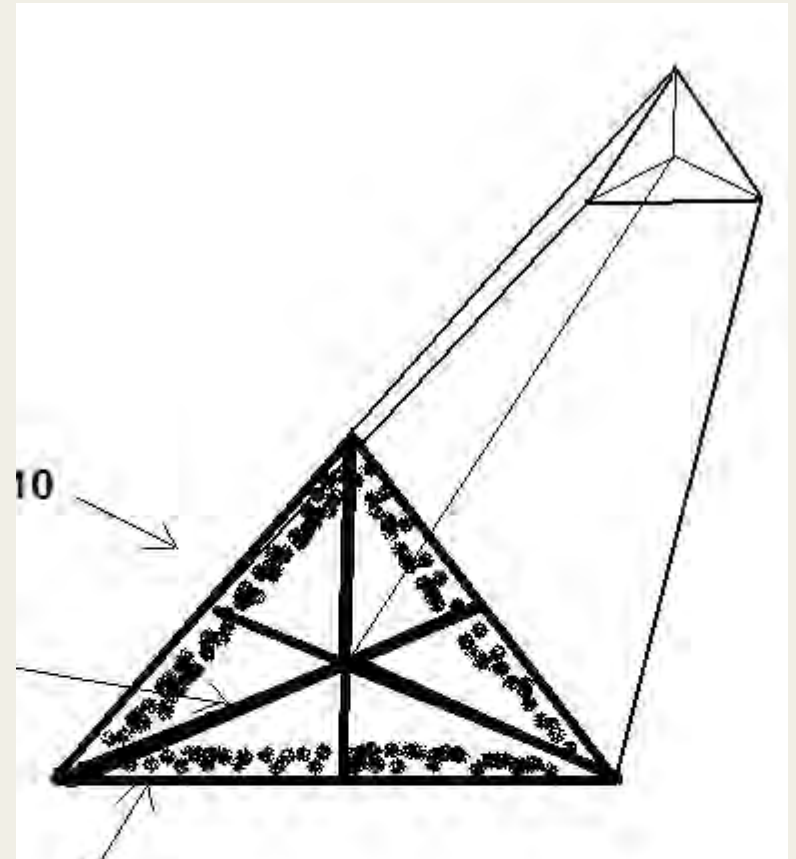
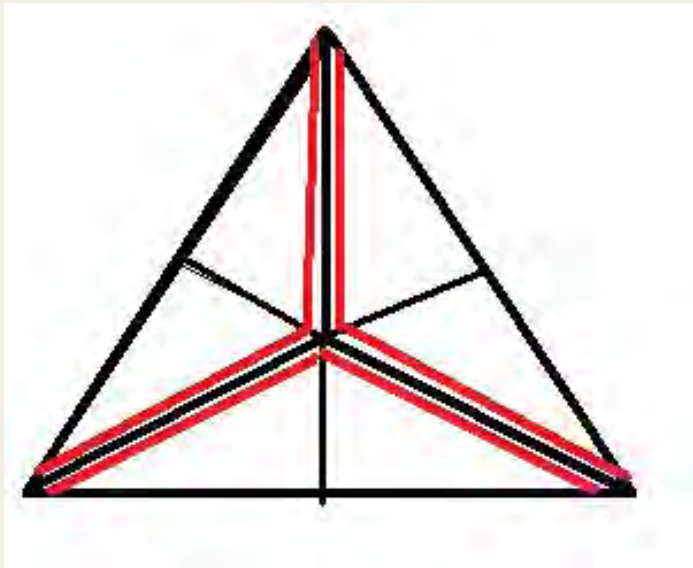






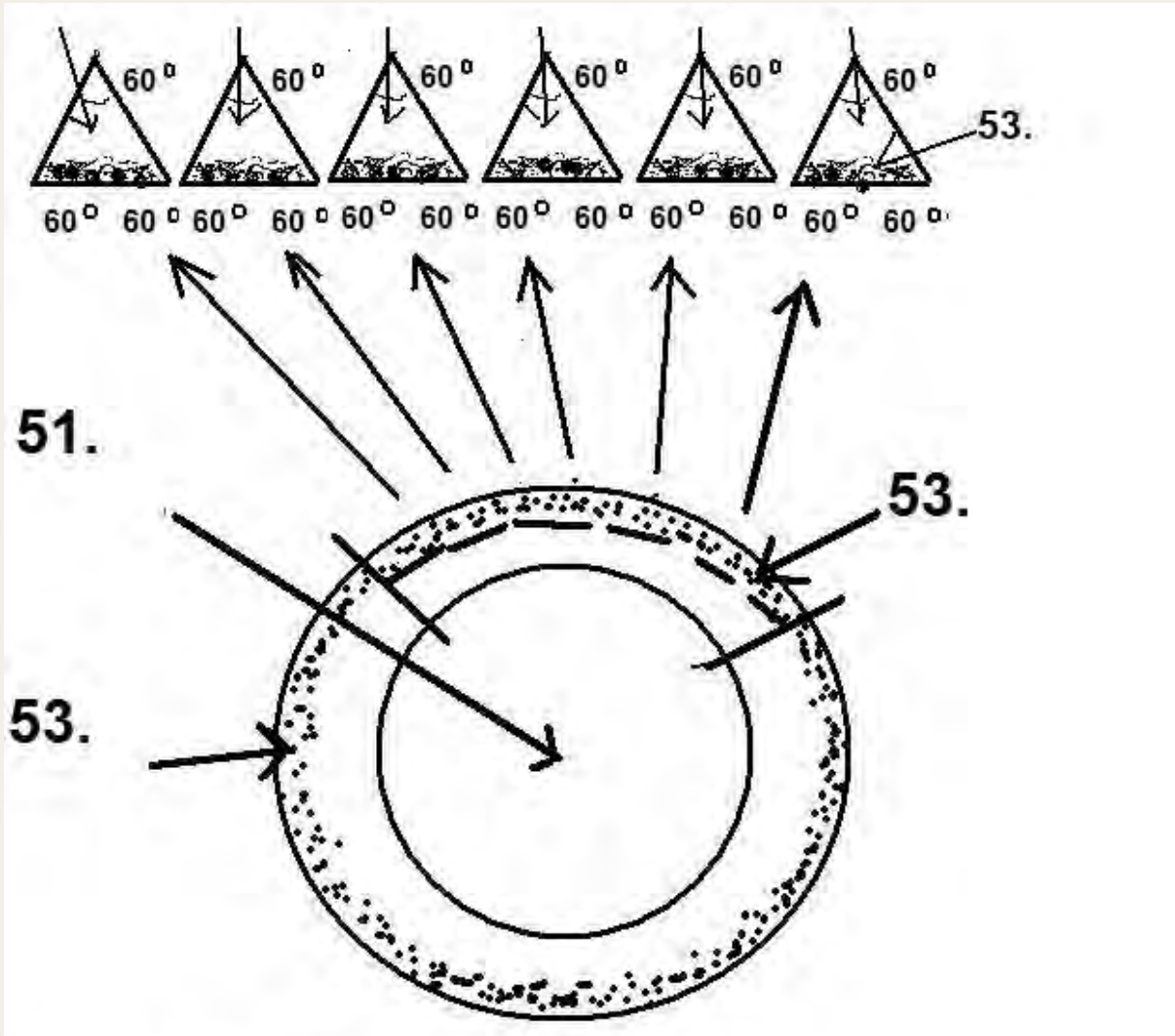


2. TRIANGLE rod with six strips TRISTAR structure



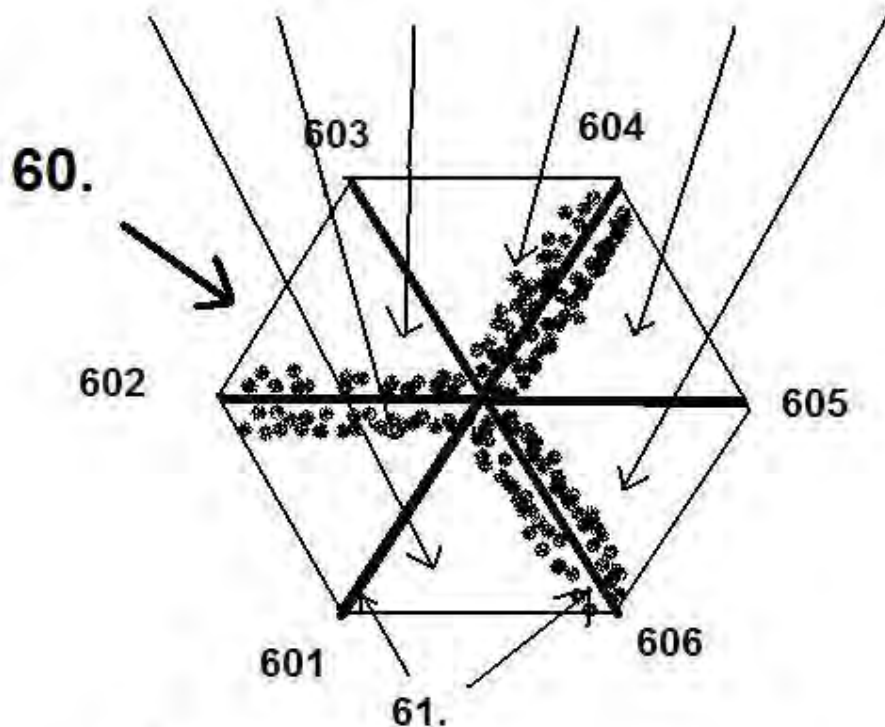
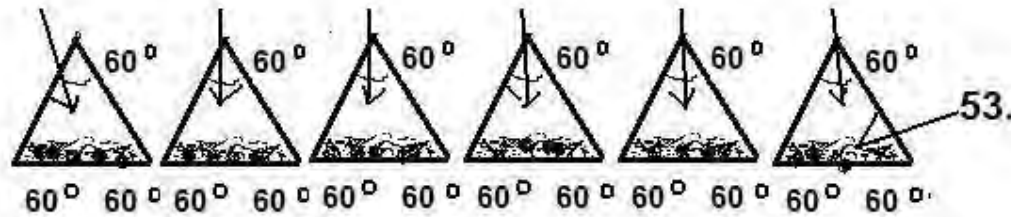
TRIANGLE rod with six strips TRISTAR structure:

- Start with 6 normal HEX strips



TRIANGLE rod with six strips TRISTAR structure:

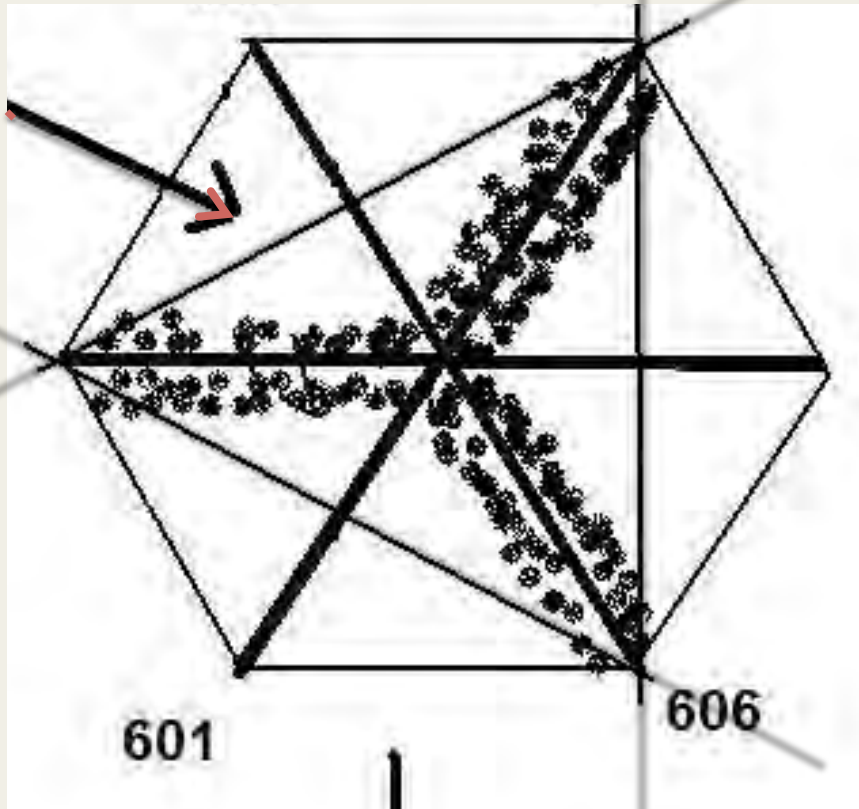
- Glue HEX strips inside out with power fibres against to each other



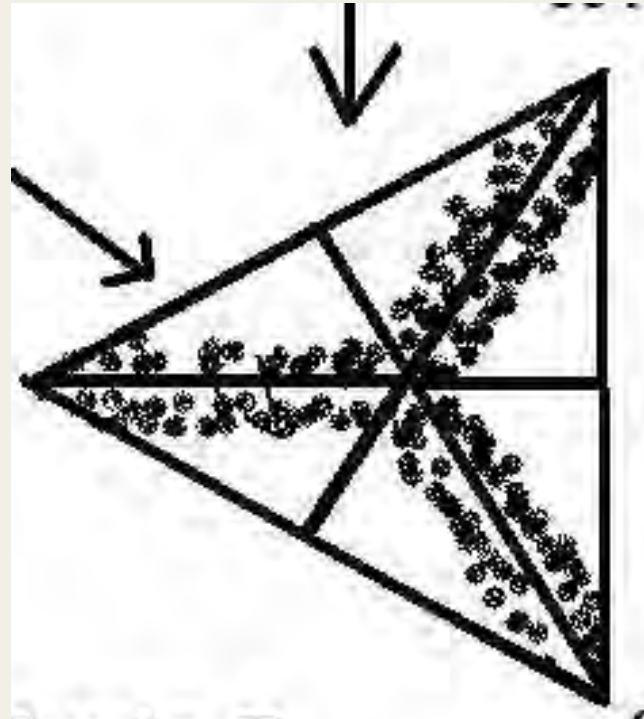
TRIANGLE rod with six strips TRISTAR structure:

- plane soft part of the outside away to get triangle shape

PLANE AWAY

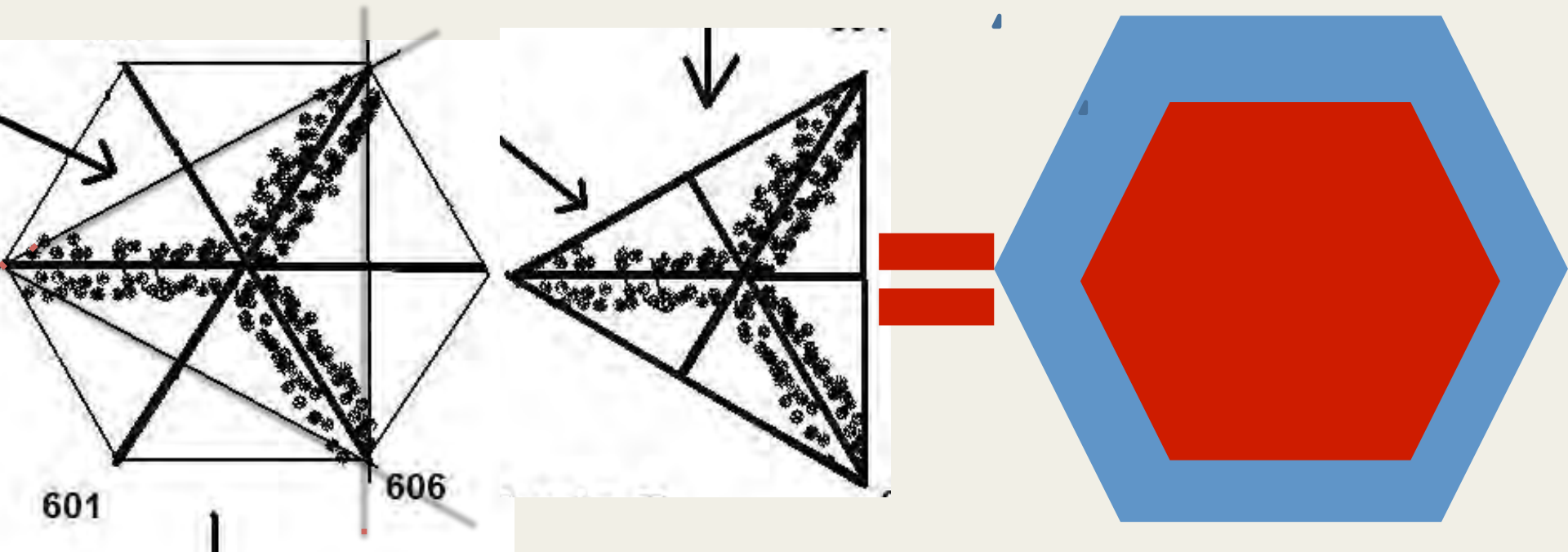


FINAL SHAPE



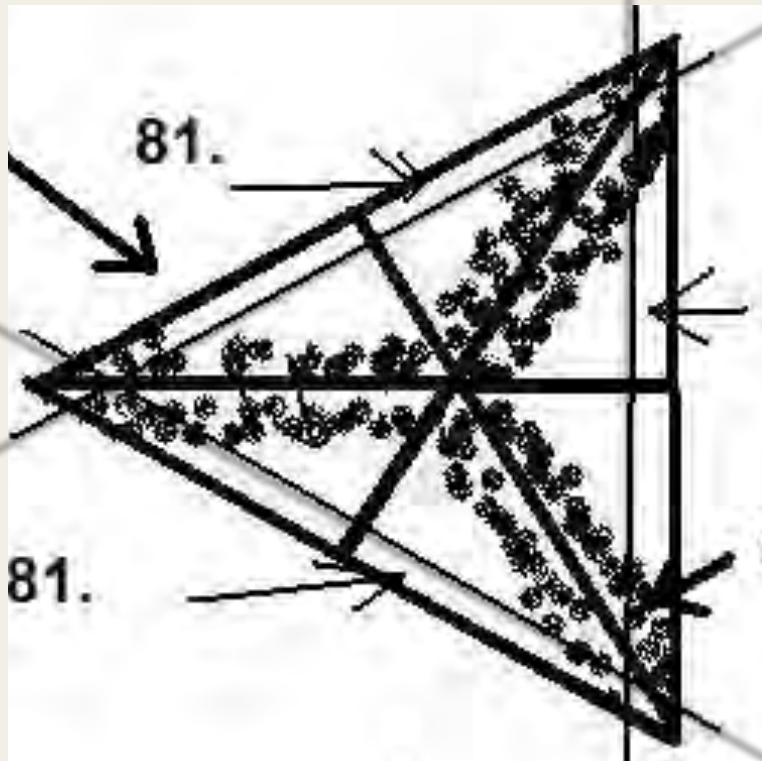
TRIANGLE rod with six strips TRISTAR structure:

- plane soft part of the outside away to get triangle shape
- The mass is diminished by 50%. This is equal to 70% hollow building because power fibres are not lost!

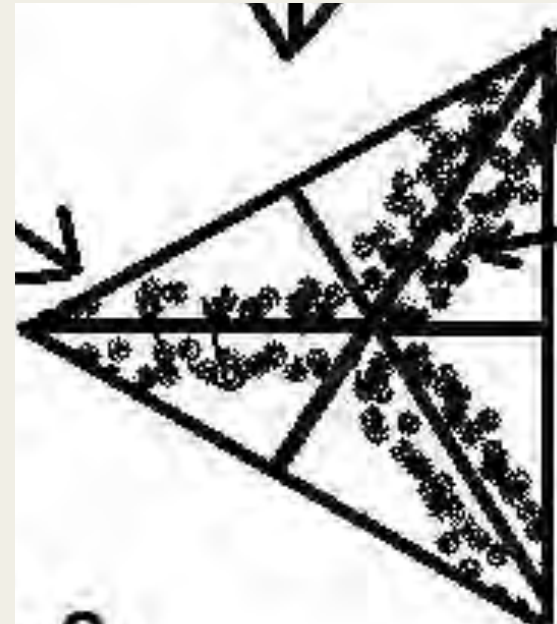


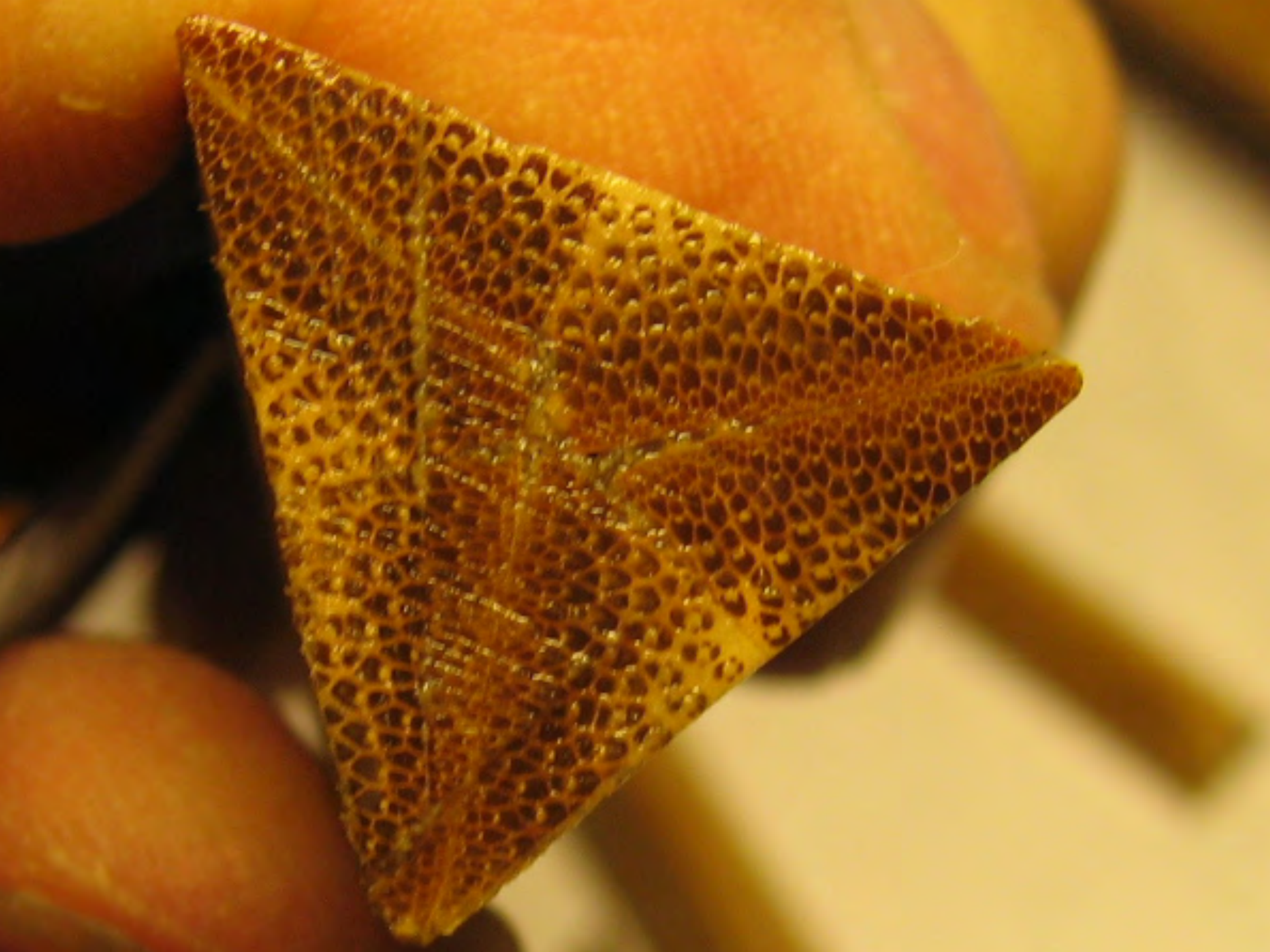
TRIANGLE rod with six strips TRISTAR structure:

You may plane the taper thinner because of the inside-out structure – no extra power fibres are lost



New taper









TRIANGLE ROD PROBLEMS

- 1.No tapers available
- 2.No ferrules, joints
- 3.No handle
- 4.No line guides





TRIANGLE ROD PROBLEMS

1.No tapers

The geometry is simple (*1,40) BUT

**TRIANGLE rod with same mass is about
#2-3 AFTM class stronger than the
original taper**

Tapers by TRIAL – AND – ERROR!

TRIANGLE ROD PROBLEMS

2. Ferrules, joints

Metal ferrules – not too easy!

Scarf / spliced ferrule is OK for single hand rods.

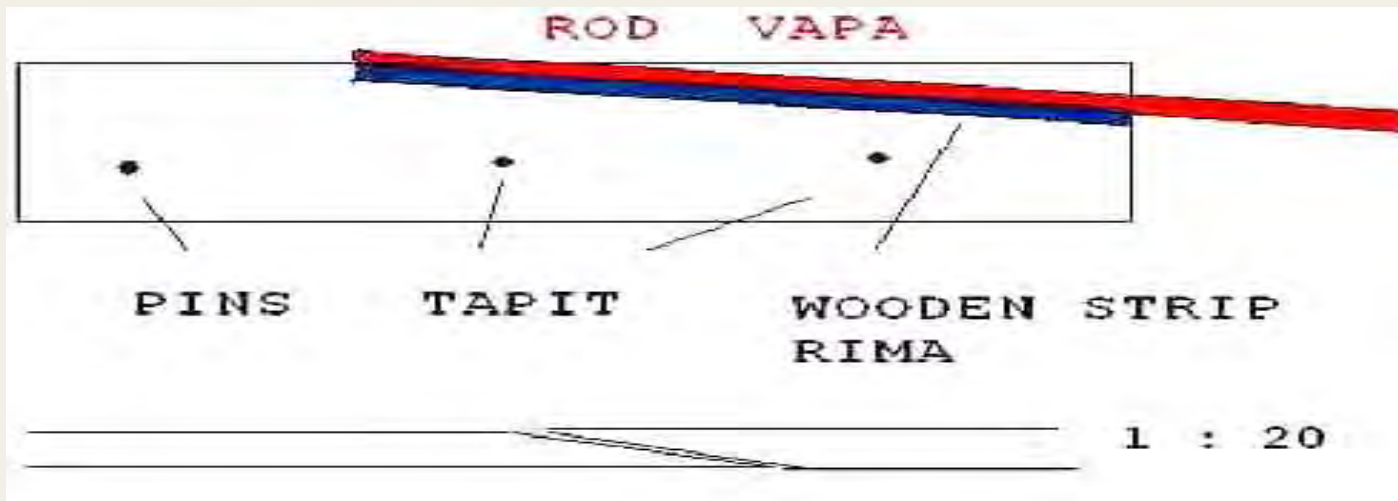
Bamboo ferrule is OK for single hand rods.

The problems has been in two-hand salmon rods – the stress at first joint is very high causing breaks -> bayonet joint

**Bamboo ferrule is OK
for single hand rods**



Scarf / spliced ferrule is OK for single hand rods



SHRINK TUBE SCARF / SPLICED FERRULE





TRIANGLE ROD PROBLEMS

The problems has been in two-hand salmon rods – the stress at first joint is very high causing breaks -> bayonet joint



Simply the triangles are fixed base - to - base

BAYONET JOINT IS EXTREMELY STRONG (AND UGLY)

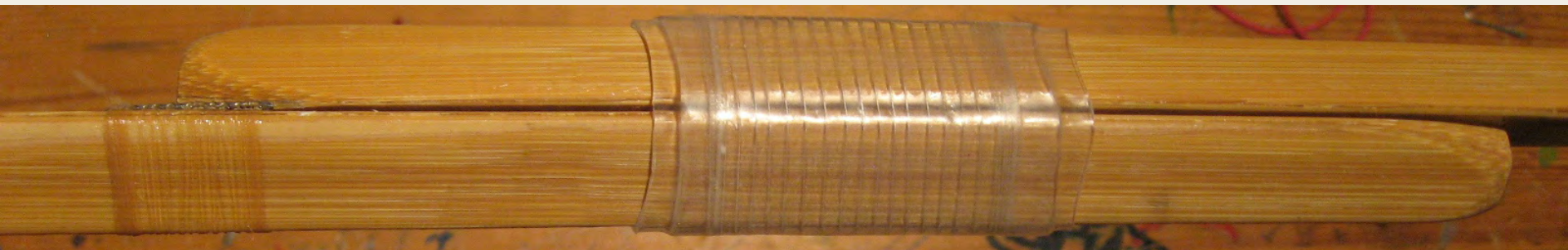


BAYONET JOINT IS EXTREMELY STRONG (AND UGLY)

Note shrink tube insert in the middle of the joint to help taping.

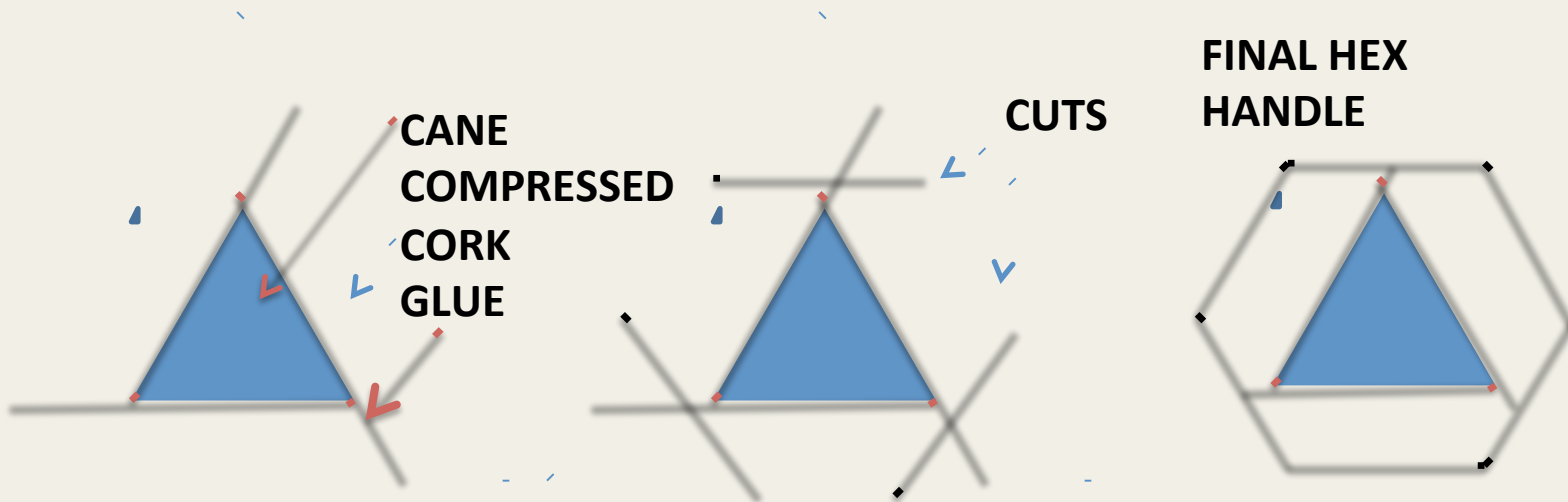


Metal wire support for the oblique stress



TRIANGLE ROD PROBLEMS

3. HANDLE HEX handle into TRI rod



TRIANGLE ROD PROBLEMS

3. Handle using compressed cork plate



TRIANGLE ROD PROBLEMS

3. Handle - PU glue



TRIANGLE ROD PROBLEMS

3. Handle – compressed cork with thin PU surface



TRIANGLE ROD PROBLEMS

4. Line guide problems:

TRI rod is stronger if you cast the "sharp" angle forward → the guide feet has to be modified.

Bayonet joint turns the triangle → guides are different in shape.

SOLUTION : DO IT YOURSELF - DIY!

**12,5' #9-10 two hand salmon rod , three strip TRI,
hollow, bayonet joints, weight 392 g, underhand cast
using 35 gram sinking-tip 9,5 m shooting line**





THANK YOU!