

## Bā yīn Project 八音 : 8 sonorous paintings

A generator/destructive method of sounds and images

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**Abstract.** The project links painting with music, taking Chinese concepts depicted alongside Western solutions, by using Bāyīn-八音 principles focused on 8 timbres (tone colors). Building 8 sonorous paintings, neoinstruments subsequent to Bāyīn system to be percussed and recorded: the paint weathering. The 4 transdisciplinary formats resulting: a-Exhibition, b-Concert, c-Performance and d-”Microrobot ballet”, where the 8 swarm robotic variations/permutations conduct a new generation of paintings: music newly influenced by the new paintings. A generator device versus an erosive tactic. Music and painting mutual sustainability.



**Introduction.** The project bā yīn 八音 is about a relationship between painting and music, by using Oriental concepts presented alongside Western solutions, making 8 hybrids sonorous-paintings.

Chinese sensibility is always alert and ready to the perception of subtle energies and resonances. In fact Chinese is a tonal language and sound timbre is the soul of the music; thus a musical piece becomes another completely different if the timber changes. Any aspect in Chinese culture is not an isolated phenomenon but rather a contextual part related to diverse aspects of life: emerging special kind of cosmogonist systems.

The poem *Bāyīn* “Eight sounds” is part of the literary gem *The Sanzijing* (Southern Song Dynasty), which embodies the Neoconfucian ideal of uniting education, moral and philosophy. However the precepts and timbre perception date from the 7th century Before the Common Era.

匏土革  
木石金  
丝与竹  
乃八音

**Concept.** The project makes a system just taking those approaches to face music and painting, each other, whereas both of them emerge, develop, demonstrate and perform in unison, in a parallel and mutually binding manner. Linked but following a mutual destruction which summon the energy of an eternal vital circle.

*Bāyīn* system is completed connecting some others elements in the organization, including material/timber, orientation, season, color, element and Taoism trigram (Fig. 1).

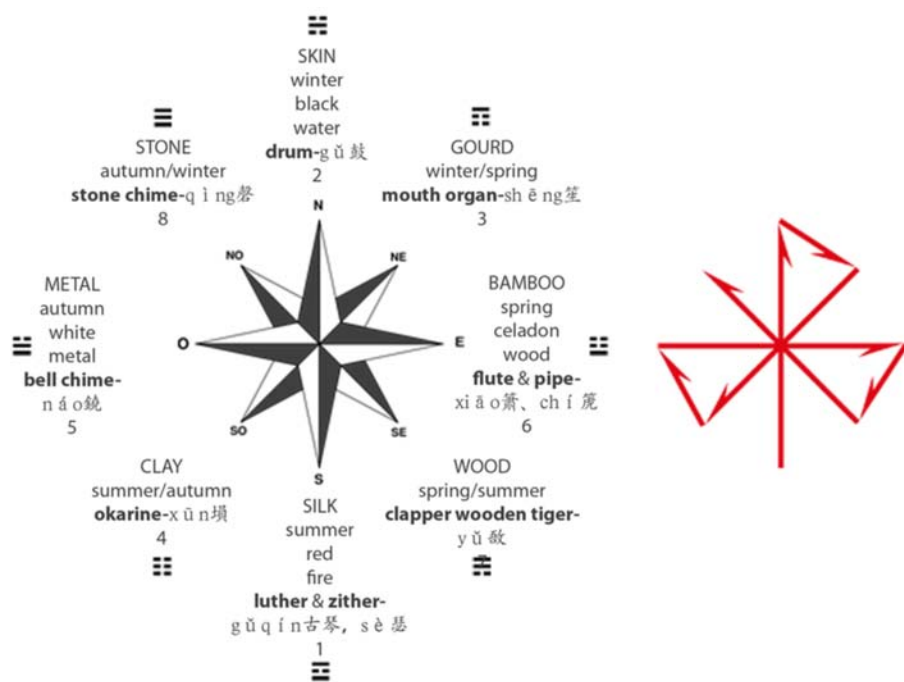


Fig. 1: *Bāyīn* system diagram.

Fig. 2: Our proposed own route of pairs within *Bāyīn* system.

**Linking Music/Painting.** We start making a manipulation on the *Bāyīn* diagram to plan a route within the elements, alternating primary pairs with secondary ones, to be applied in our own microsystem, which will give us an own visual and meaningful structure to rule the order of the sonorous paintings/instruments in the series and to be used as our trilobed logo, also (Fig. 2).

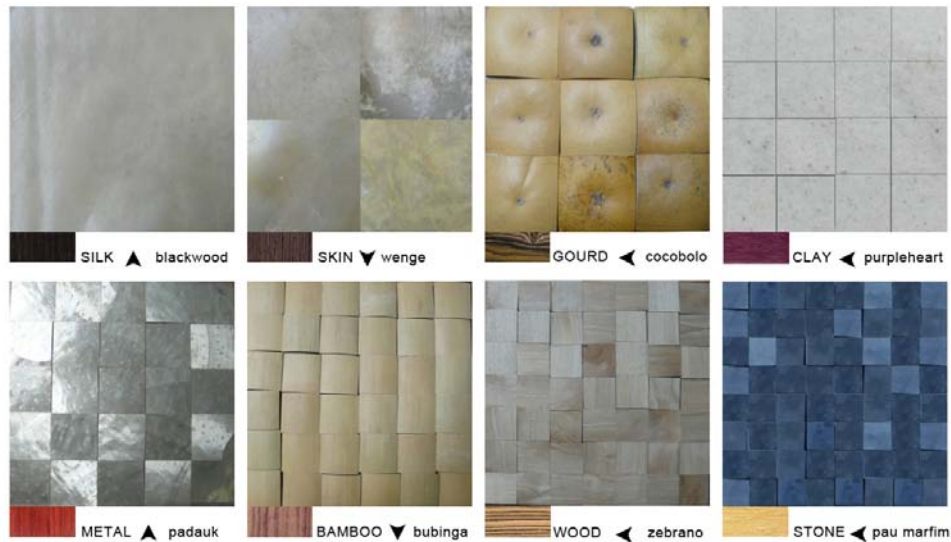


Fig. 3: The materials/timbres. Sequence resulting tesserae and direction of the woodgrain for the acoustic boxes.

We are using those materials as surfaces to paint on them, 8 materials for the 8 paintings extracted from:

Music:

skin from gǔ 鼓

gourds hú lú sī 葫芦丝

metal from luó 锣

bamboo from kuài bǎn 快板

Arts:

silk for Chinese paintings bó 帛

clayw for modeling nián tǔ 黏土

pear wood for dù lí mù 杜梨木

stone for zhǐ zhèn 纸镇



Fig. 4: Small echo chambers, retractable wooden tube and main acoustic box.

A simple numerical succession makes a kind of mosaic in each painting-instrument resulting 204 tesserae distributed inside 8 main acoustic boxes (Fig. 3). Thus each of the tesserae has an own small echo chamber size embedded in the main acoustic box, it depending of the sonorous painting that belong to. Likewise each small echo chamber has a retractable wooden tube inside, being able to tune each of them controlling the length. Both length and distribution of the tubes in the main acoustic box are ruled following 4 different criteria: visual composition, numerical distribution following Sino-Western mathematics concepts, Western music values and Chinese music principles (Fig. 5-8).

**The Music.** Notation range and tube lengths:

4	10	10	10	4
D3-E3	C4-D4	C4-D4	C4-D4	D3-E3
6	6	8	6	6
G3-A3	G3-A3	A3-H3	G3-A3	G3-A3
8	8	8	8	8
A3-H3	B-H3	A3-H3	A3-H3	A3-H3
6	6	8	6	6
G3-A3	G3-A3	A3-H3	G3-A3	G3-A3
4	10	10	10	4
D3-E3	C4-D4	C4-D4	C4-D4	D3-E3

Fig. 5: Tuning following a visual composition. Tube lengths expressed in cm.

B7	C#7	Eb7	F#7	G#7	A#7
C7	D7	E7	F7	G7	A7
B6	C#6	Eb6	F#6	G#6	A#6
C6	D6	E6	F6	G6	A6
B5	C#5	Eb5	F#5	G#5	A#5
C5	D5	E5	F5	G5	A5

Fig. 6: Tuning following a Western music way (piano).

	G South			
	4	9	2	
E	3	5 <sub>F</sub>	7	C
A	8	1	6	
		N D		

Fig. 7: Tuning following the 洛書 *luò shū*, numeric Chinese magic square. Expressed in inches.

4.3853 & 9	4.66	4.8848	5.3
C	B	Bb	A
8.376	0	0	5.551
Db		?	Ab
8	0	0	6
D	?	?	G
7.4373	7.1	6.5824	6.28
Eb	E	F	Gb

Fig. 8: Tuning following the 律呂 *lǜ lǚ*. Expressed in 尺 *chǐ*, Chinese units.

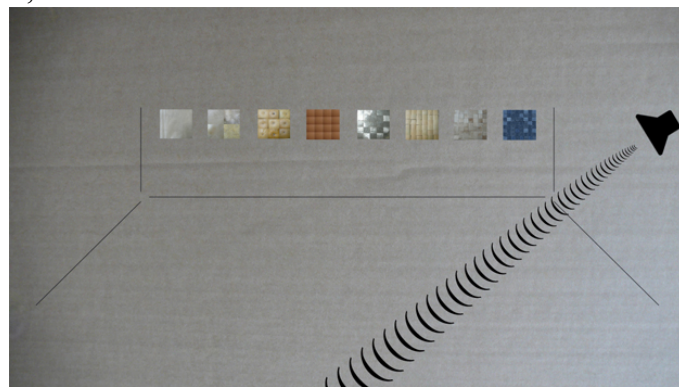
**The paintings.** Each of the paintings depiction will show the instrument in response to the material/timber, making visual reference in orientation, season, color, element and Taoism trigrams correspondingly. Using 8 shades of red, black, celadon (青) and white, each.

**Process.** Once painted, we will beat all the tiles one by one to make a recording, whereas the paint is wearing away because of the erosion, it will be significant to the sound emitted.

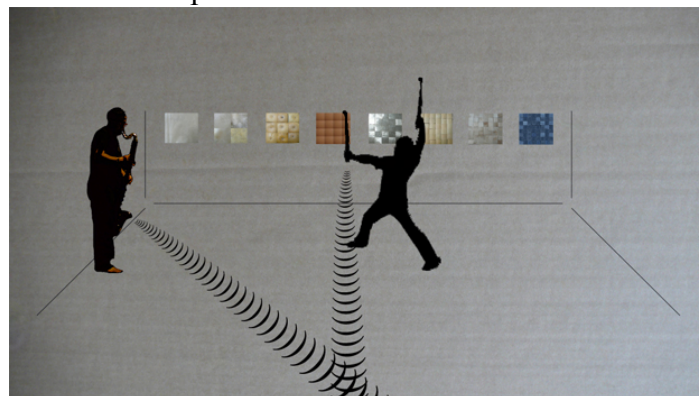
The raw sounds will be sent to 4 Chinese musicians and 4 Western counterparts to make a sound composition to accompany the paintings following 4 different Art-music formats. We propose and request a "wear sound" attitude to the musicians. It is about erosive wear (painting and sound). How could we make a sonorous composition linked with visual wear, just using the concept "to wear away" applied to the sound?

**Formats to show**

I- **Soundtrack for an painting exhibition**, showing the 8 paintings-instruments along with its percussion stick and with the "eroded sound" by the 8 musicians recorded in a loop. Audience could strike the frames, also.



II- **Duet for bass-clarinet and sonorous-paintings**, a music concert requested to a composer, keeping the "sound erosion" concept.



### III- Electroacoustic trio,

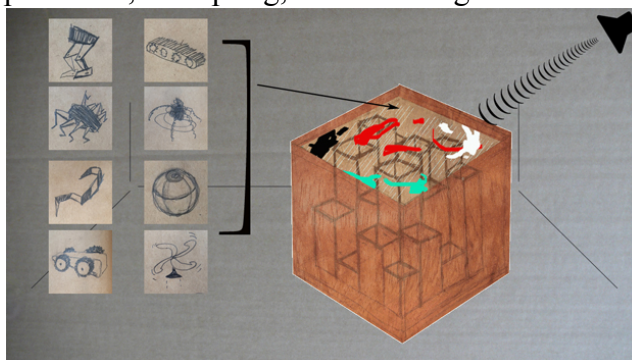
- composition performed by bass-clarinetist following the original score,
- sound-paintings extempore struck by a dancer,
- such sound is received by electro-acoustic musician improvising for processing and returning them in real time handled in consonance with music in live. The final music reached to the audience: half following the score and half improvised.



IV- **Microrobot ballet**, a dance played by 8 swarm robots designed-programmed to move stimulated by the sound issued by each sonorous-painting. But each robot will reacts interacting with the rest of specimen's movement, also, due the function ruled by ARDUINO software. The hardware is made with the correspondent exotic wood.

The inside of the main acoustic box becomes the stage when the back side is up, being able to see for first time the interior urban landscape formed with the different length of the retractable acoustic tubes and the Chinese landscape based on 8 *yàn tái* 砚台 as a model, carved on each interior main acoustic box side, significant orography for the transmission of the sound.

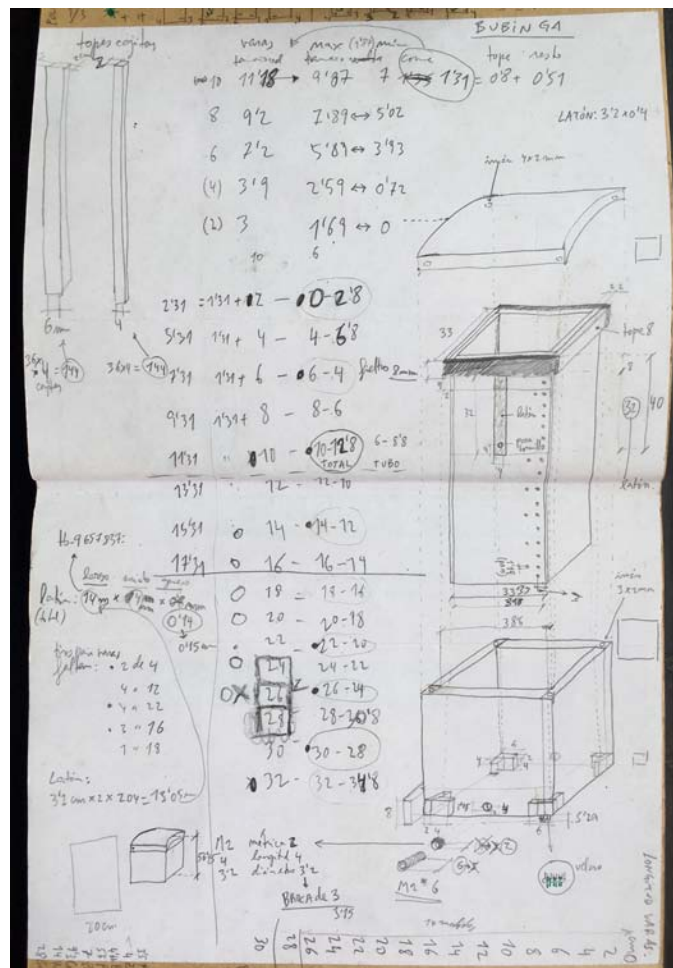
Using a glass to cover this interior stage, to put some areas with wet paint, field where the robots will move on to leave a painted trace as a result of each specimen track: biped, octopod, creeping, wheels, caterpillar belt, coil spring, ball and wings.



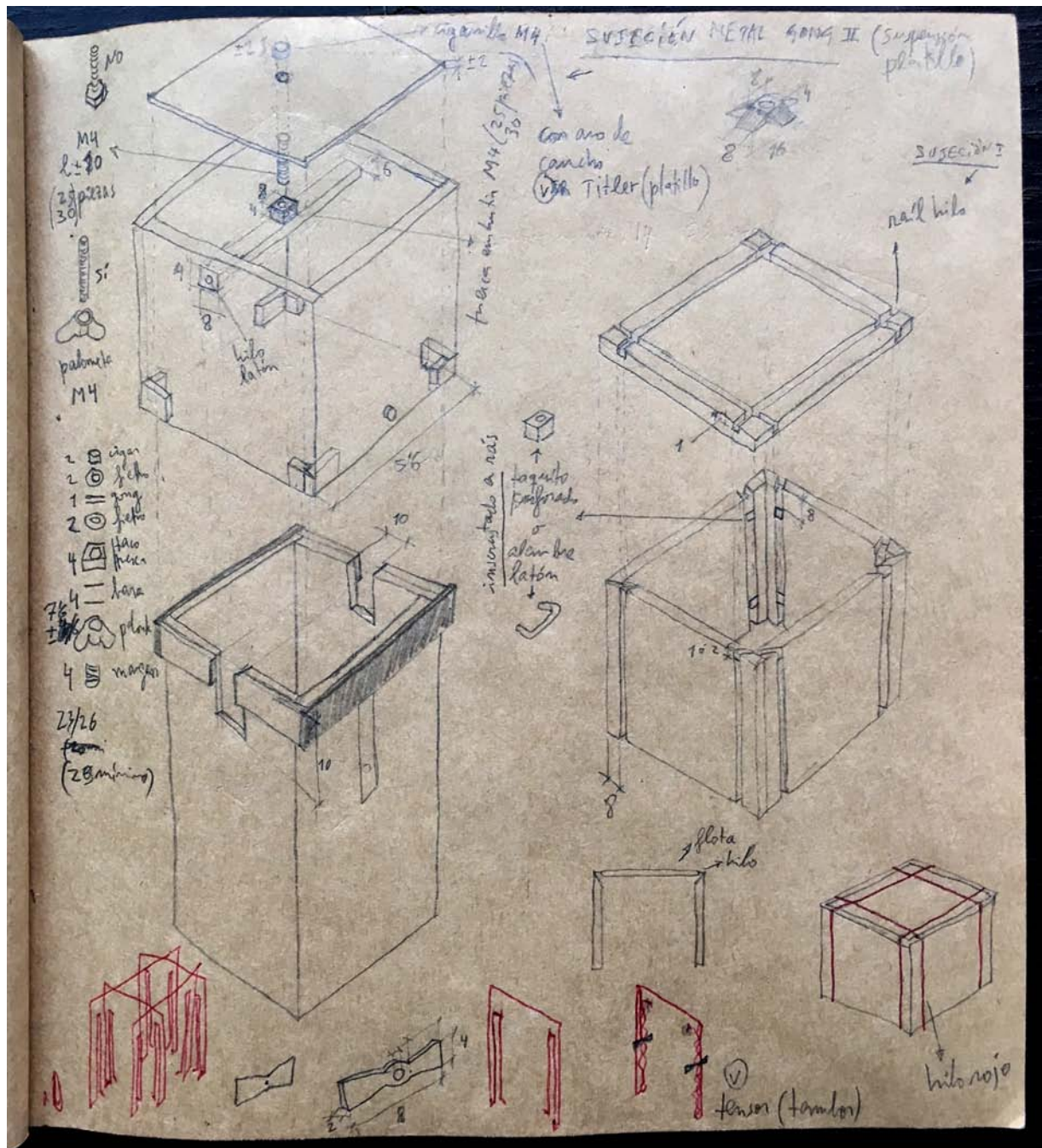
**Conclusion.** Route for the general work in process: The origin of the paintings is the music//Sound reverberations will be conditioned by the painted tesserae to percuss, but also by the hidden carved landscape in relief in the interior acoustic box (hidden during any music process, but just visible when the robotic ballet)//Consequence of the sound tones tis he painting erosion and final disappearance// Robotics are moving following the music//Each robotic variation-permutation gives new paintings.

From this moment we are able to paint on the eroded sonorous-painting surfaces, again, to depict a replica of the robot's paintings (model). It would start a new circle-generation with the meaning of a reedited facsimile, whereas a palimpsest evolution. Our micro-system method it self-restarts while it self-destroys... Music-painting sustainability!

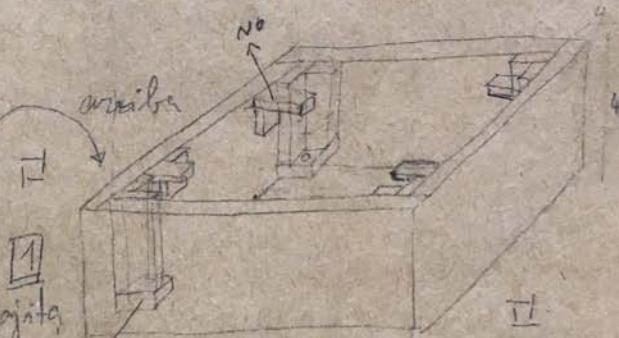
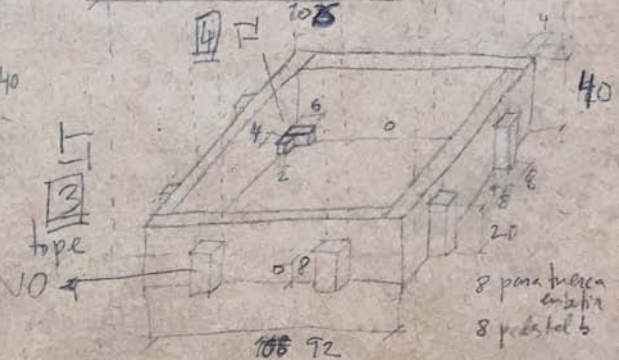
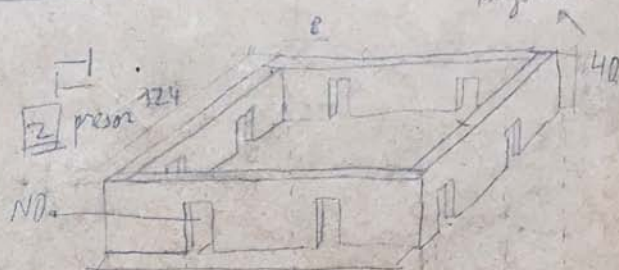
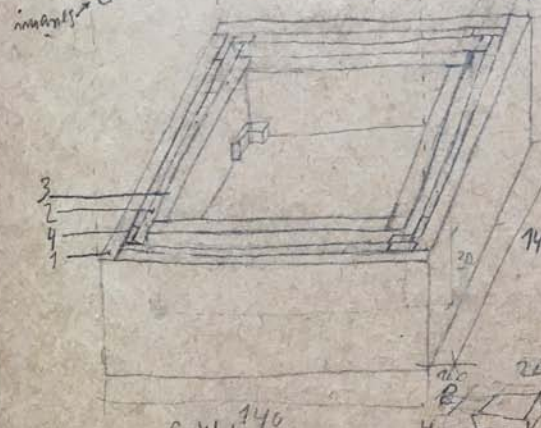
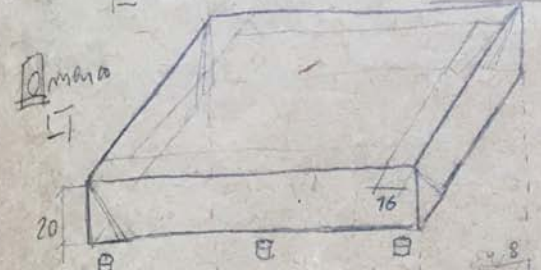
Notebook sketches:







00 piel-PLIEGUES 420 124 WENGE



- + 0: Mano: 140x20x420 16  
 + 1: Ya  
 1-2a: 20x8x32 16  
       12x8x32 16  
 1-2b: 20x16x4 16  
 x2: 124x8x40 16  
 x3: 116x4x40 16  
 4a: 6x2x4 16  
 4b: 4x2x4 16  
 GRUESOS PIEL:  
 I: 160mm  
 II: 128  
 III: 124  
 IV: 155

