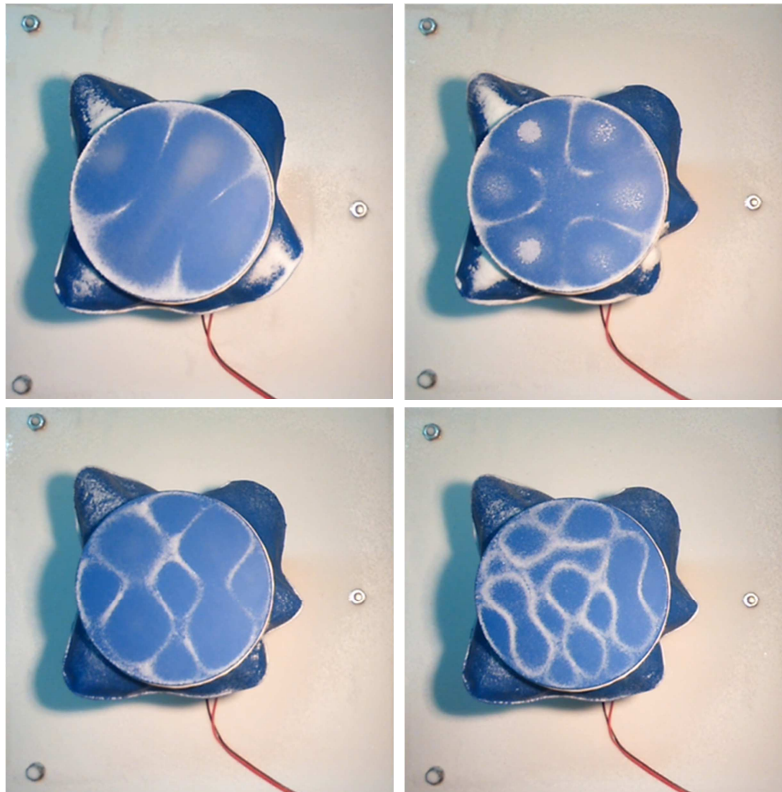


Annexos

LA CIMÀTICA EN DUES FREQUÈNCIES SIMULTÀNIES

Un pas més per a la visualització de l'harmonia musical



Autor: [REDACTED]

Pseudònim: Cimàtica

Tutors: [REDACTED]

Institut: [REDACTED]

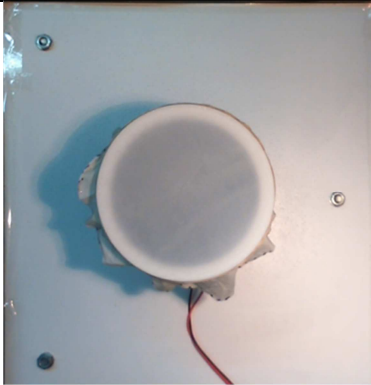
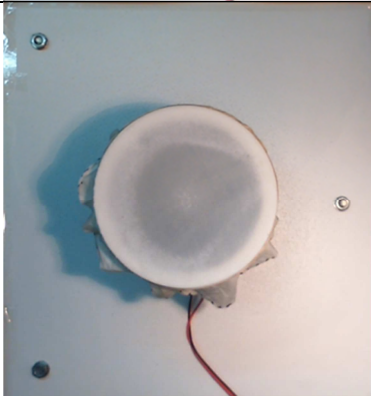
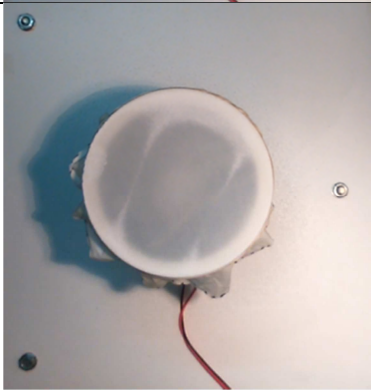
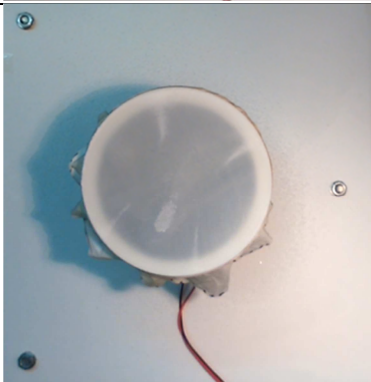
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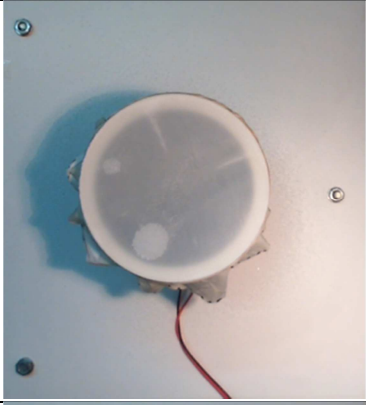
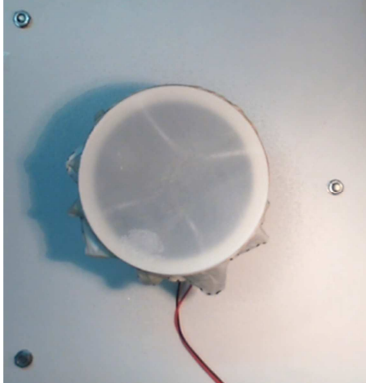
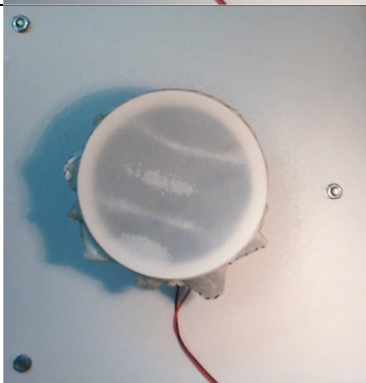
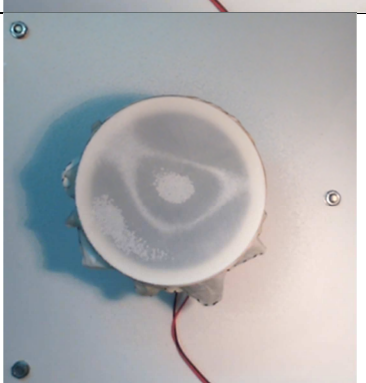
Cursos 2014-2015 i 2015-2016

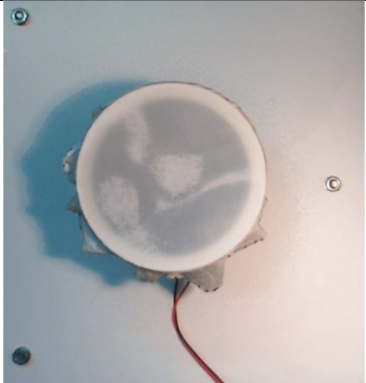
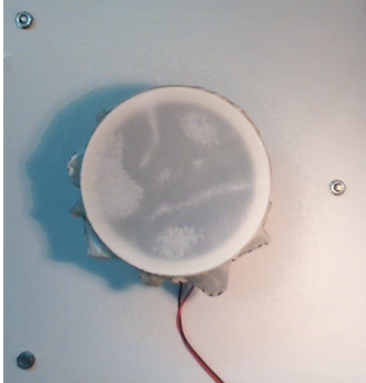
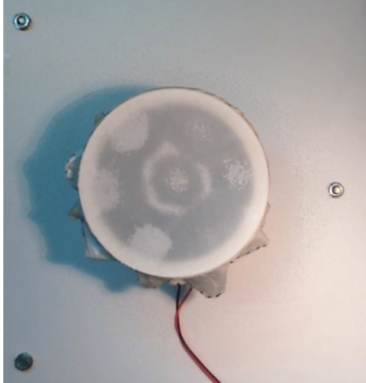
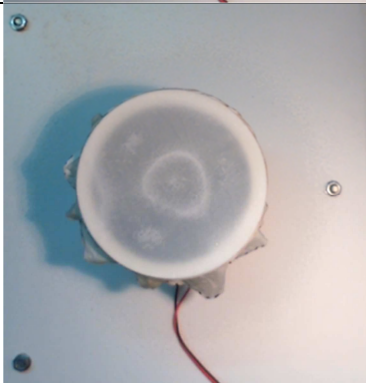
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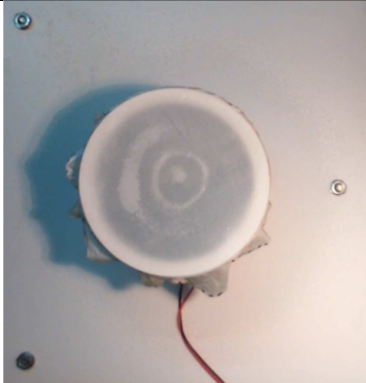
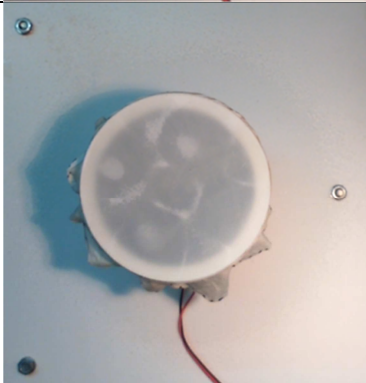
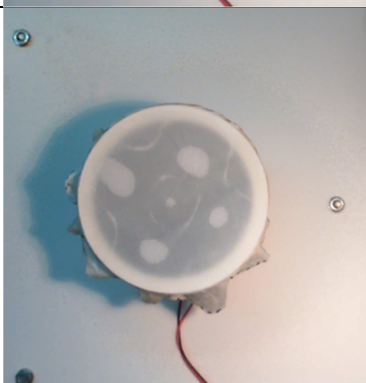
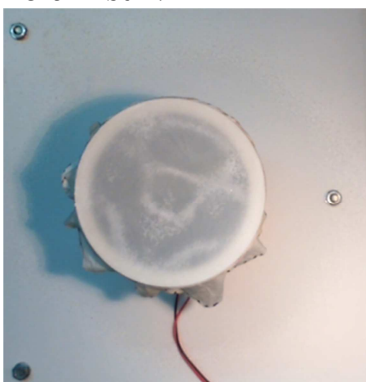
Annex 1: Membrana 1	2
Annex 2: Membrana 2	15
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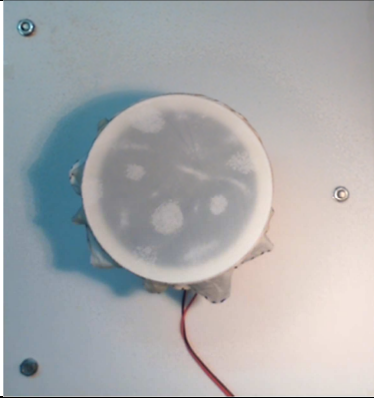
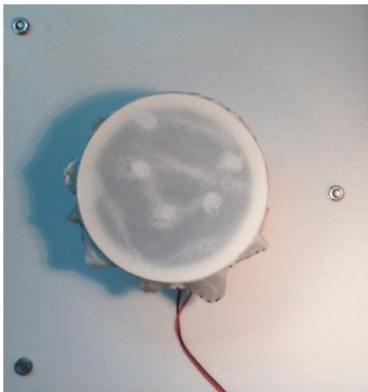
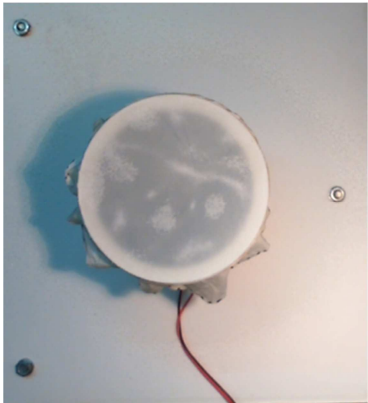
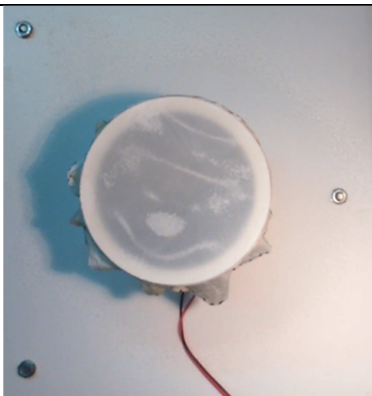
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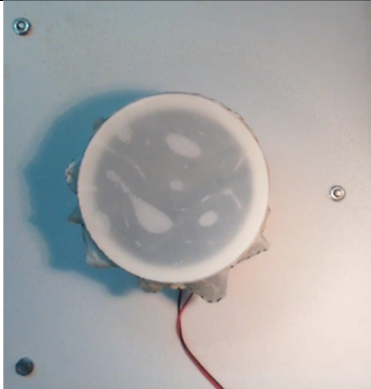
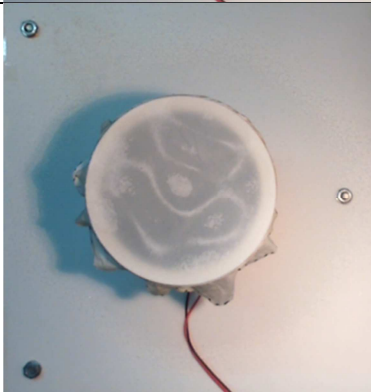
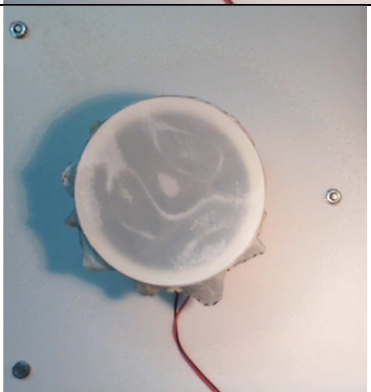
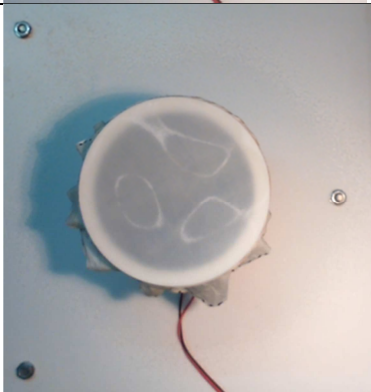
Membrana 1		
Freqüència (Hz)	Figura	
50-250		
275-190		
304		
314		

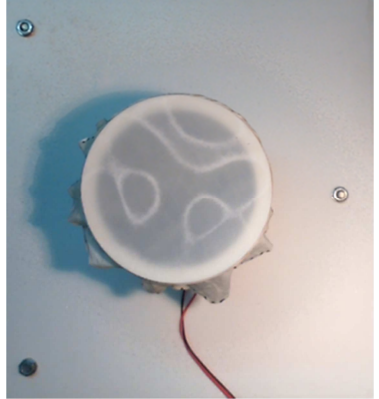
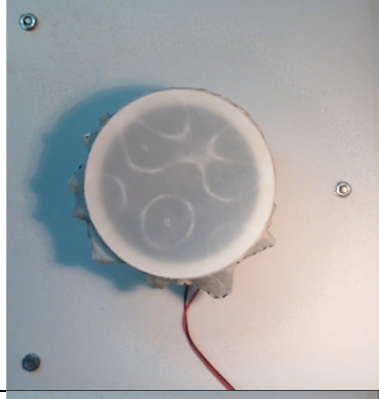
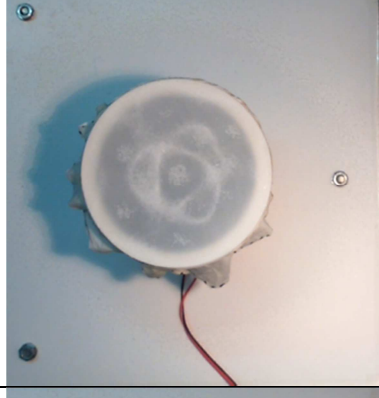
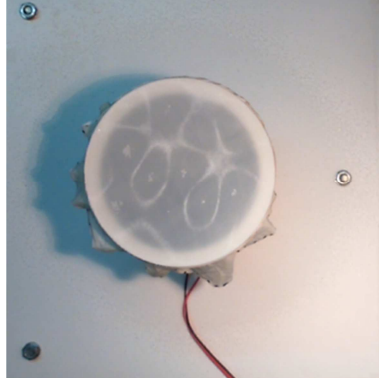
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324		
333		
372		

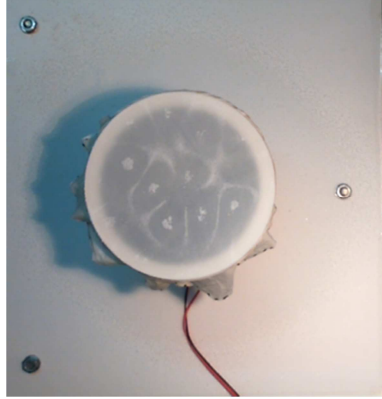
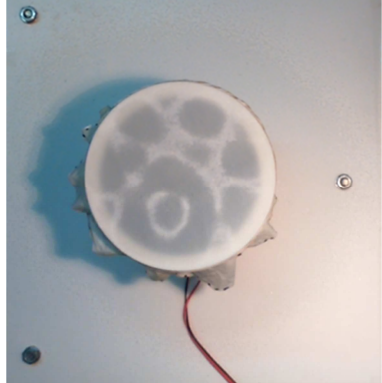
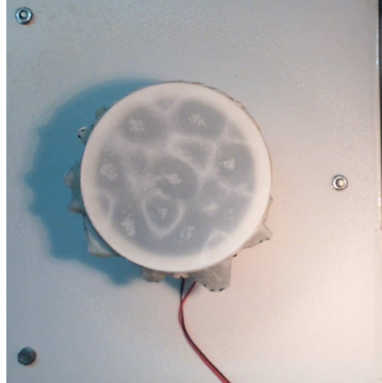
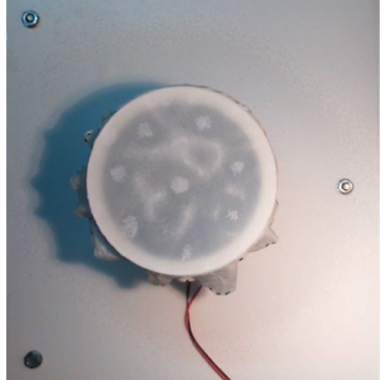
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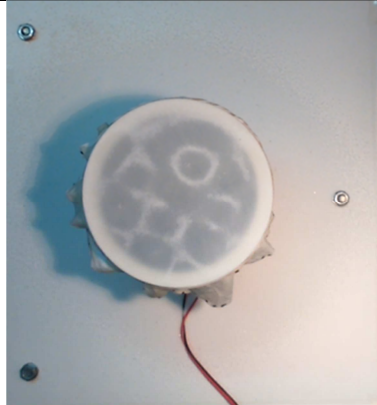
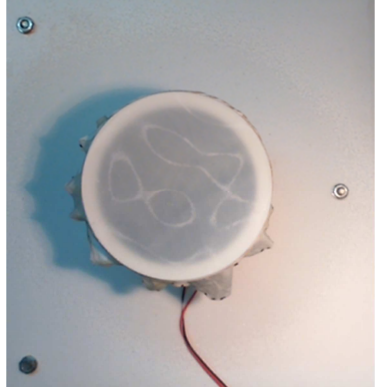
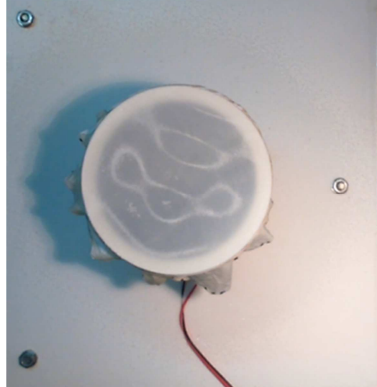
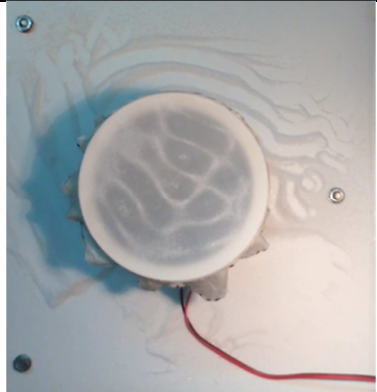
490		
525		
550		
564	<p>volum baix</p>  <p>volum alt</p>	

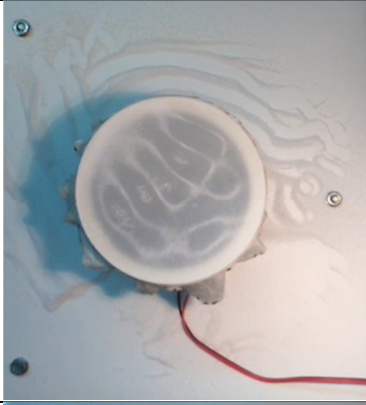
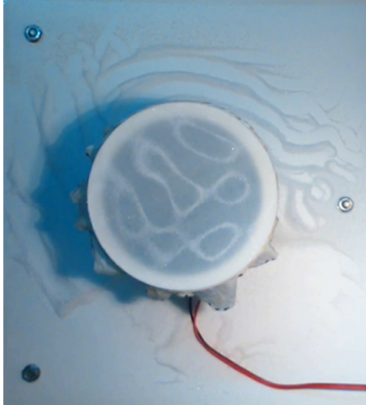
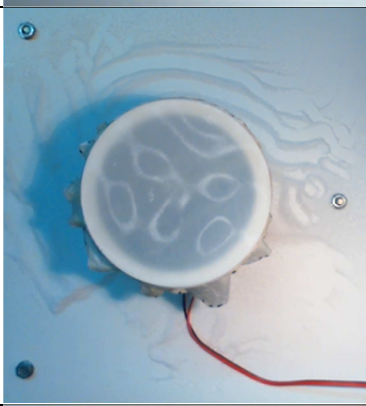
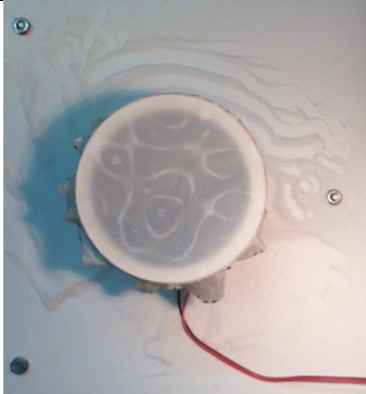
		
567	<p>volum baix</p>  <p>volum alt</p> 	
579		

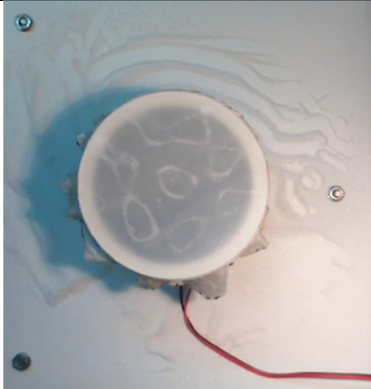
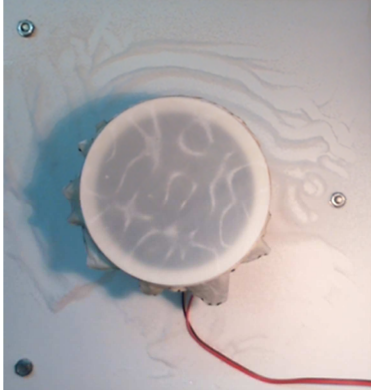

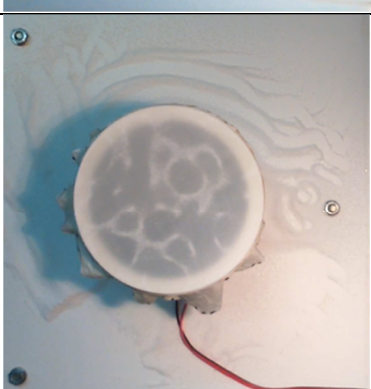
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628		
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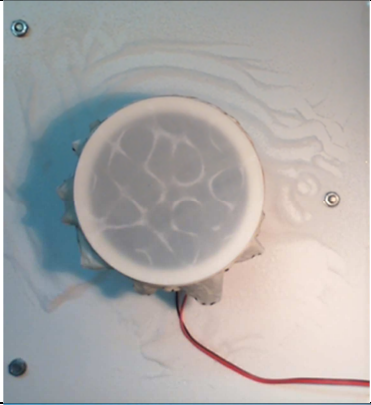
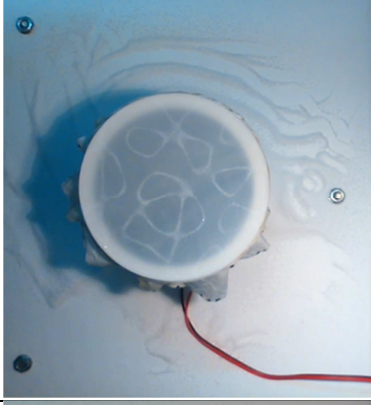
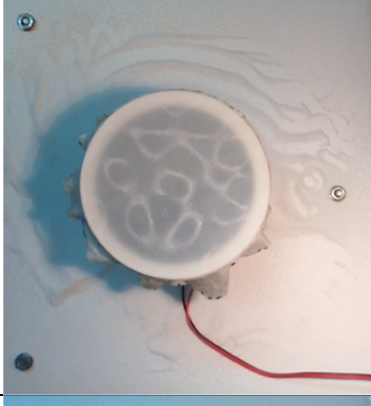
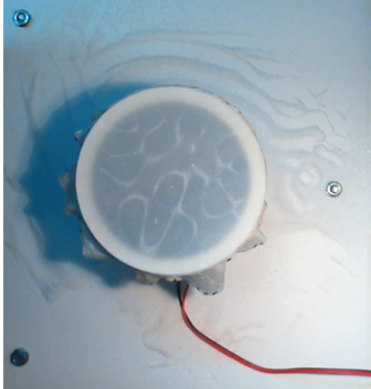
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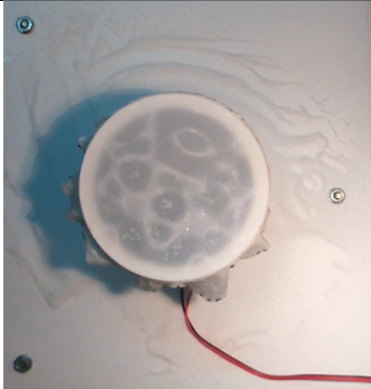
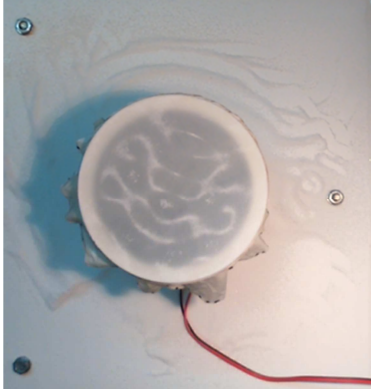
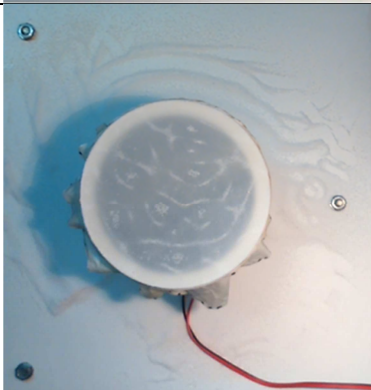
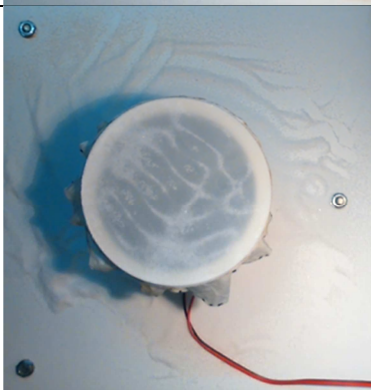
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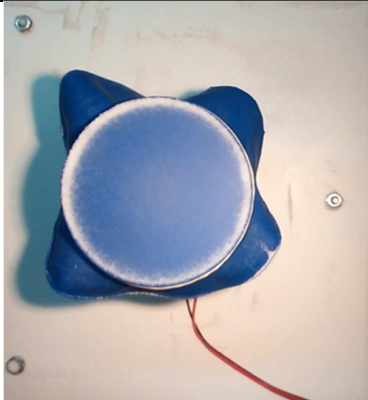
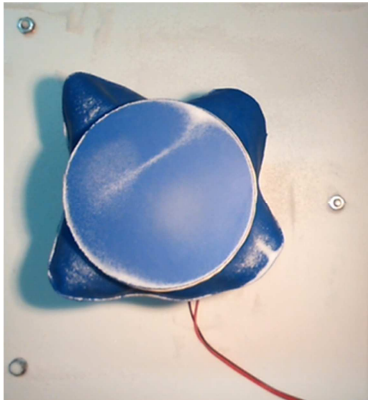
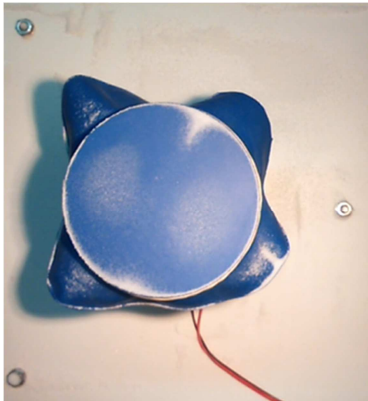
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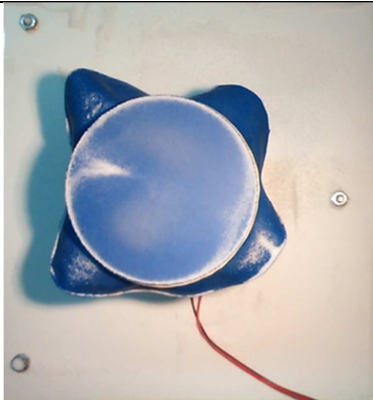
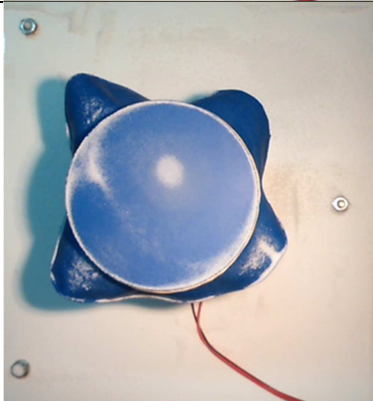
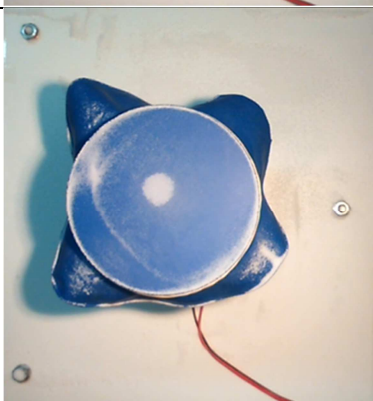
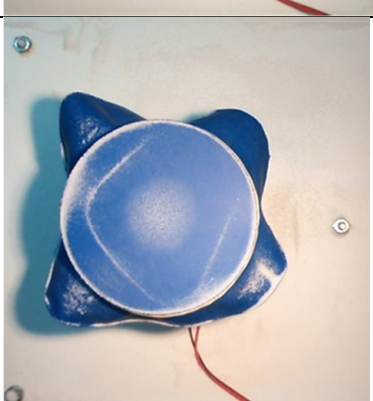
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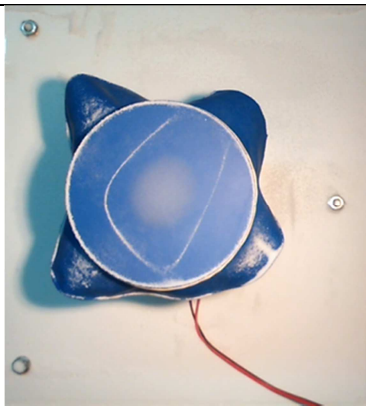
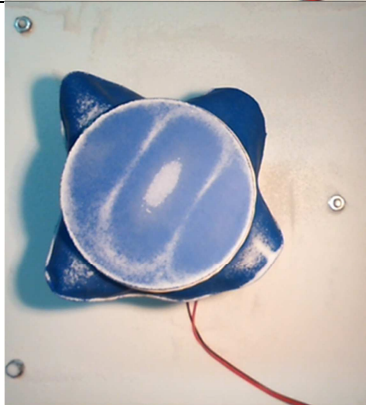
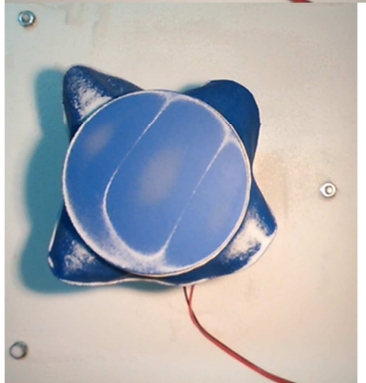
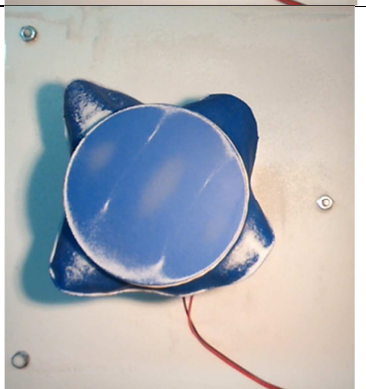
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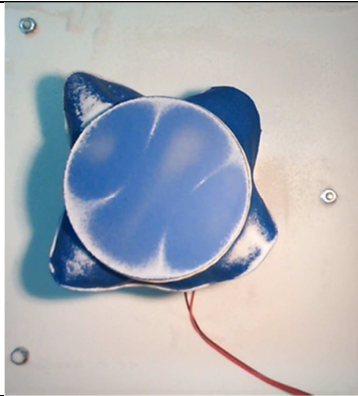
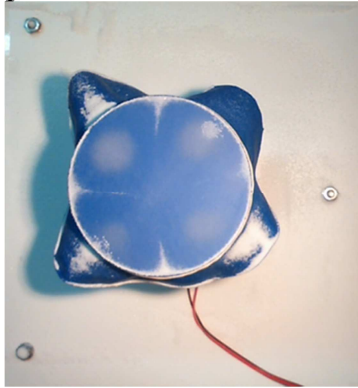
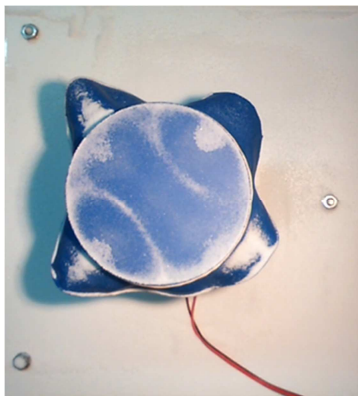
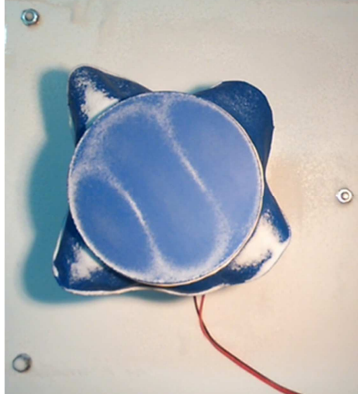
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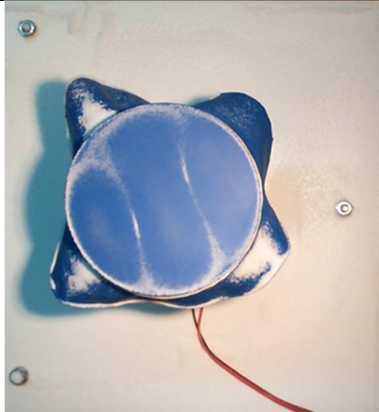
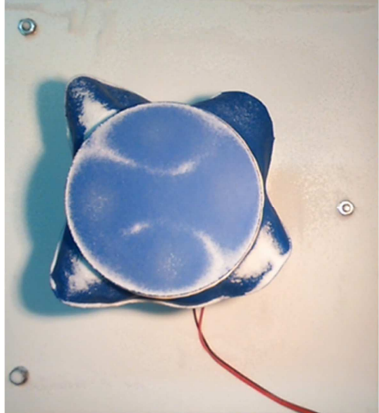
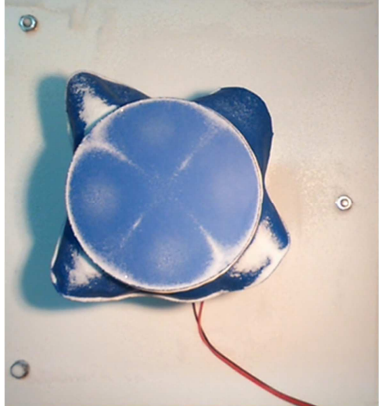
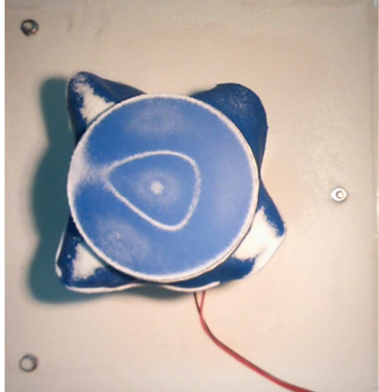
Annex 2: Membrana 2

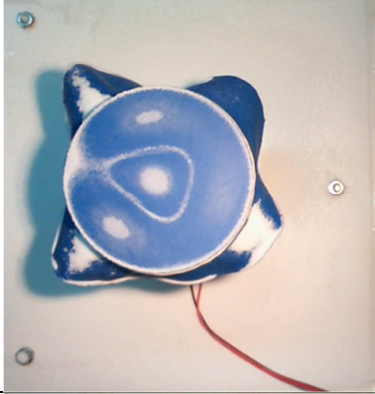
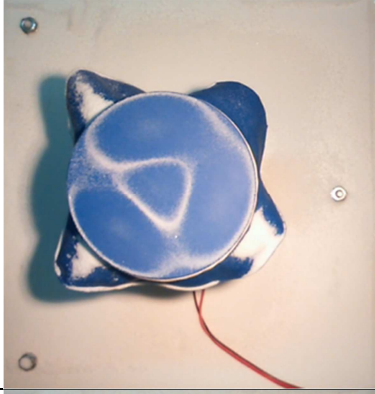
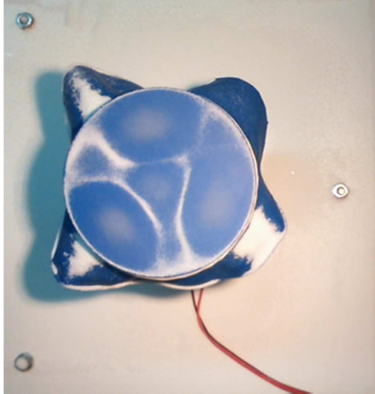
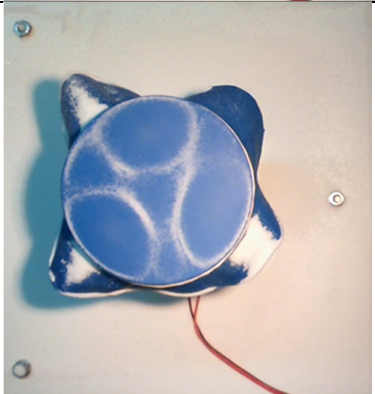
Membrana 2	
Freqüència (Hz)	Figura
40-270	
276	<p>volum baix</p>  <p>volum alt</p> 

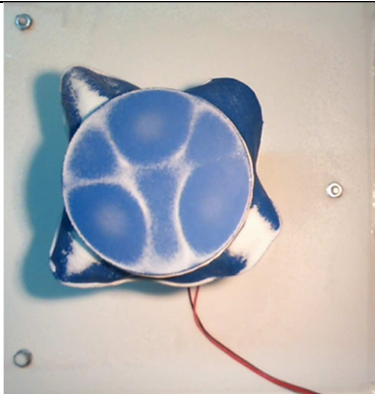
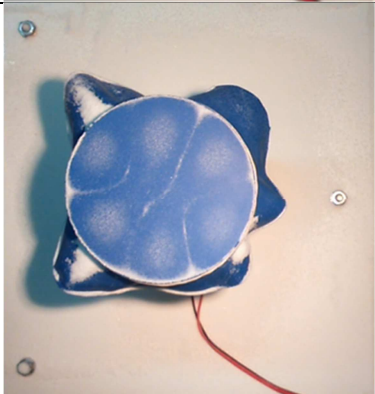
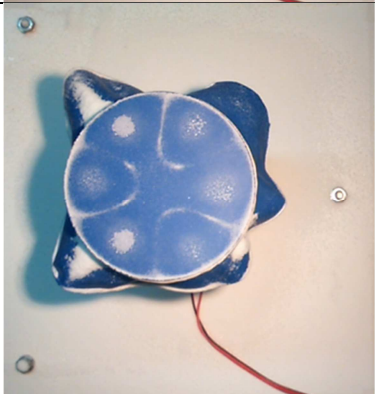
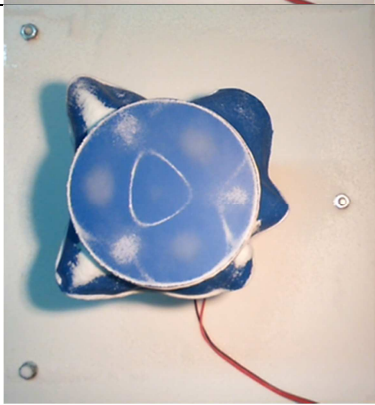
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303		
319-331		

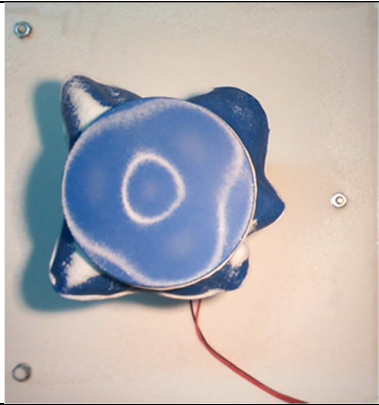
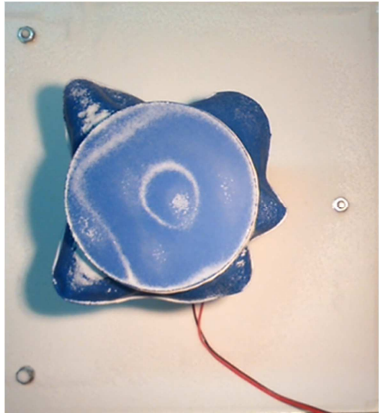
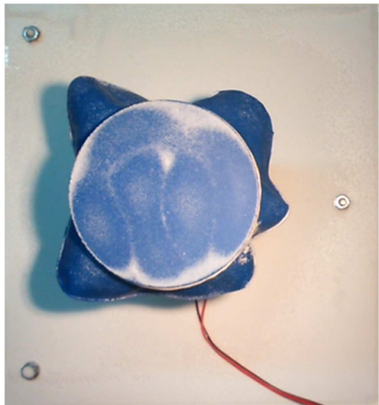
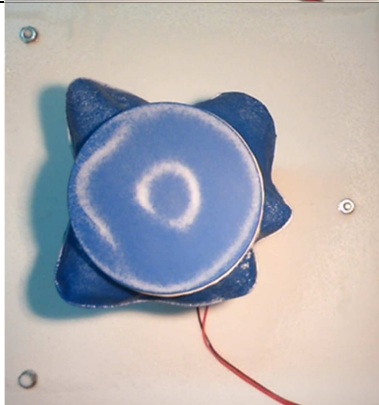
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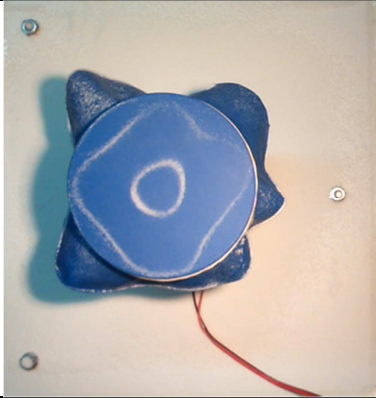
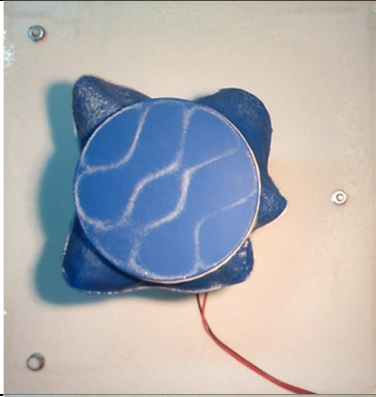
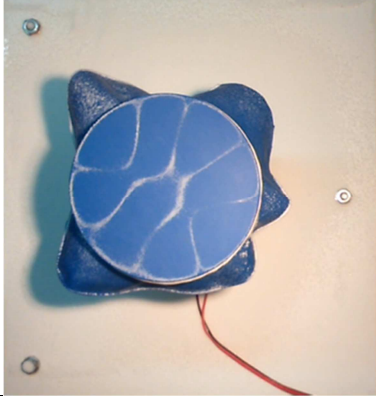
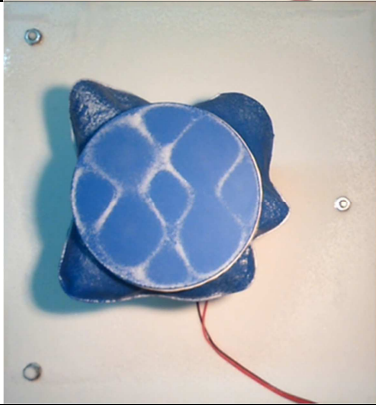
382		
386	<p data-bbox="563 593 686 627">poca sal</p>  <p data-bbox="563 1008 678 1041">més sal</p> 	
393		

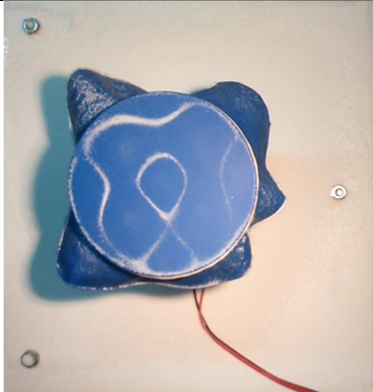
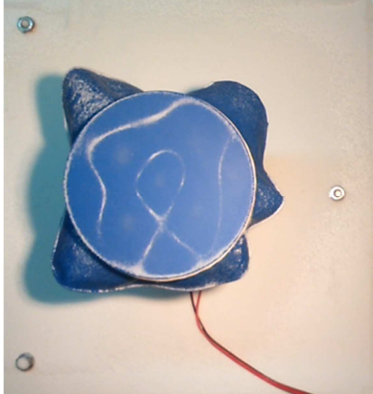
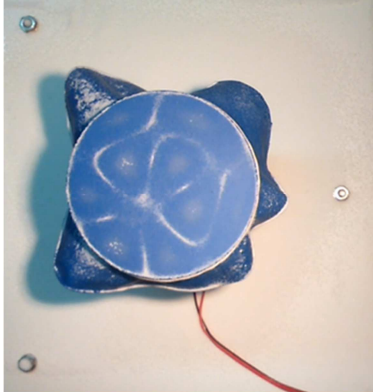
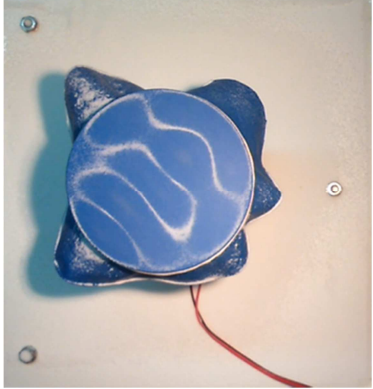
397 (ha girat una mica)		
401	<p data-bbox="563 607 730 640">volum baix</p>  <p data-bbox="563 1061 707 1095">volum alt</p> 	
434		

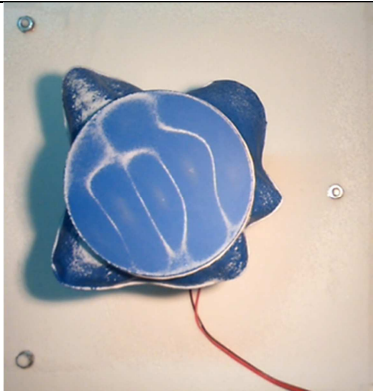
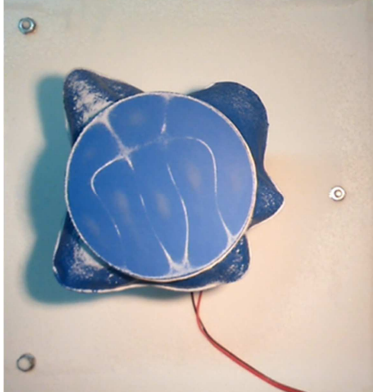
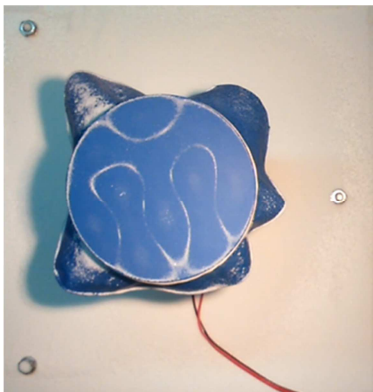
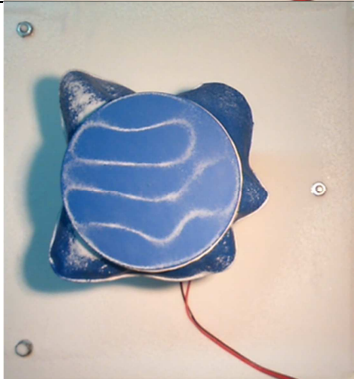
454		
471		
479		
486		

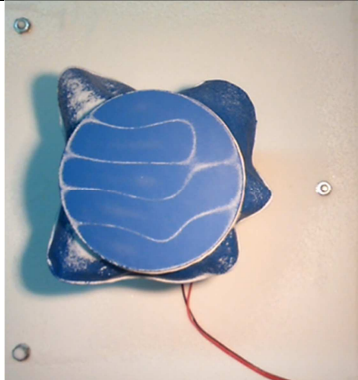
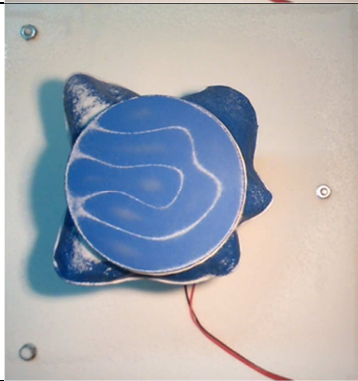
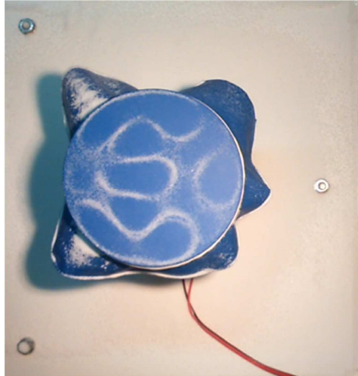
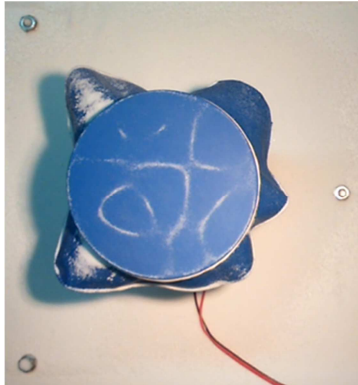
		
491		
499		
506		

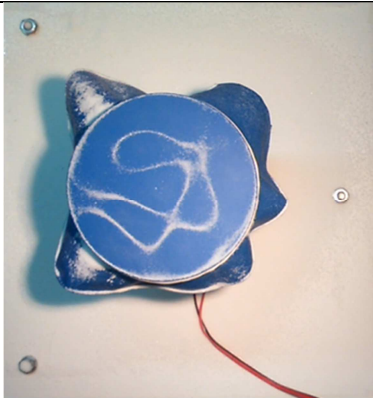
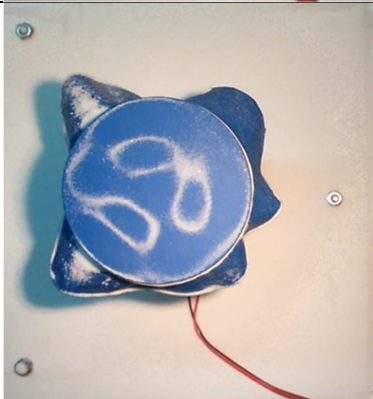
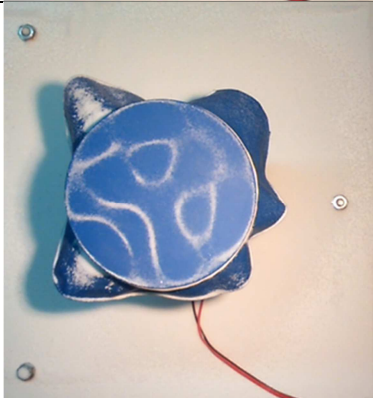
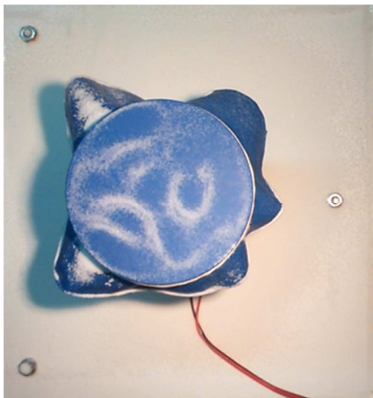
516		
534	<p data-bbox="563 591 730 629">volum baix</p>  <p data-bbox="563 1039 707 1077">volum alt</p> 	
547-572		

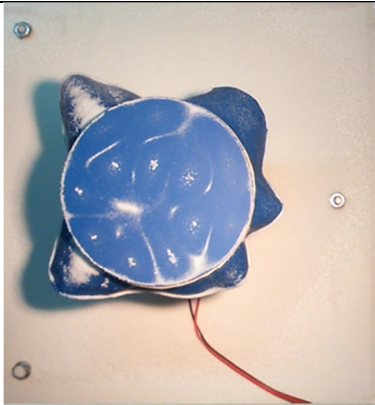
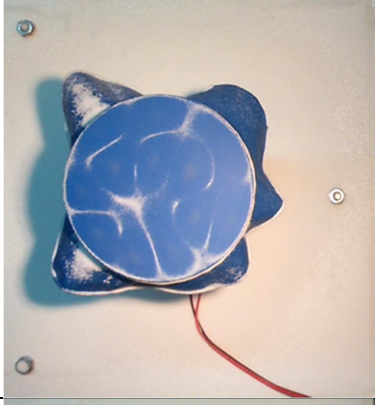
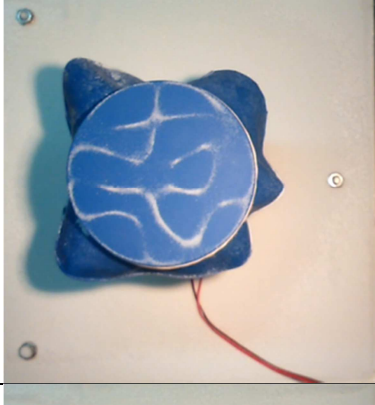
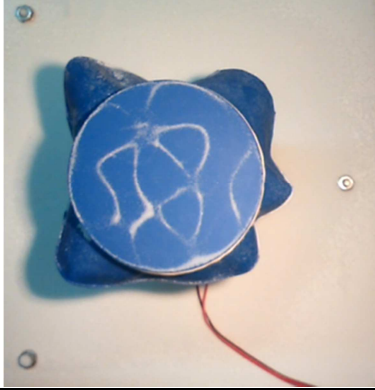
584		
598		
602		
610		

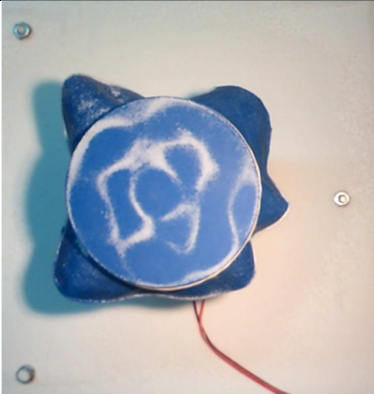
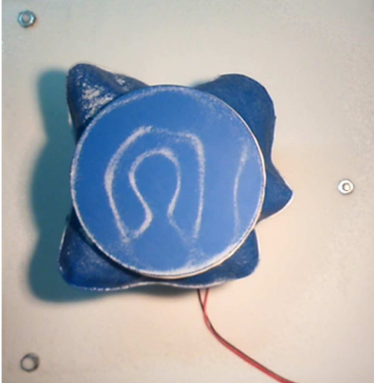
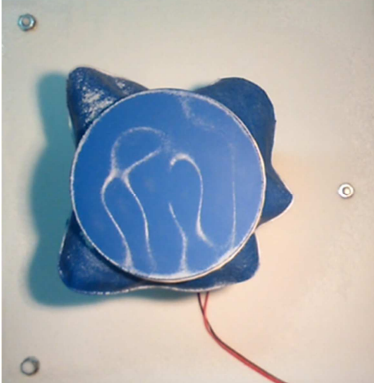
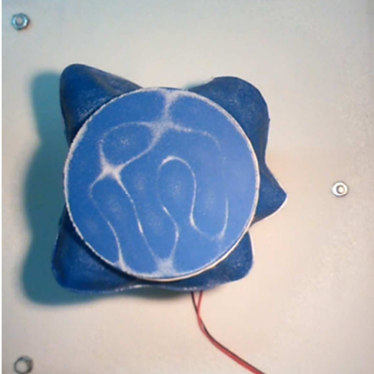
620		
634		
643		
651		

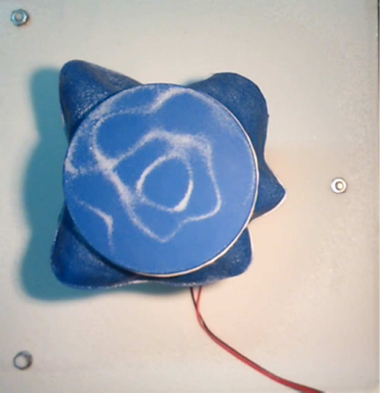
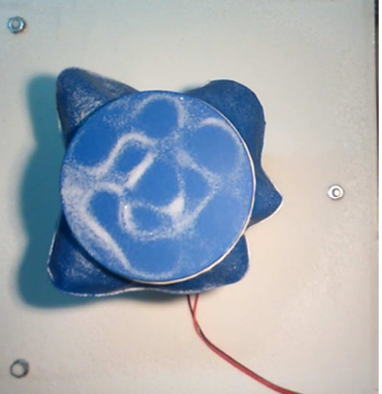
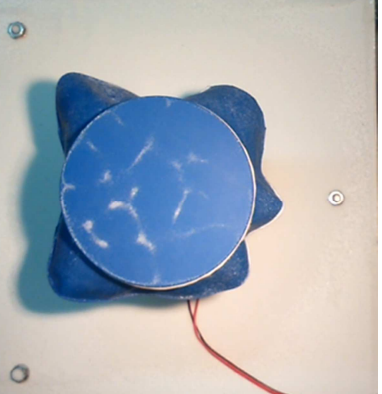
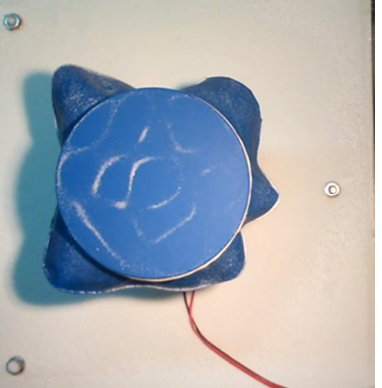
		
662 va girant	 <p>volum baix</p> 	
674		

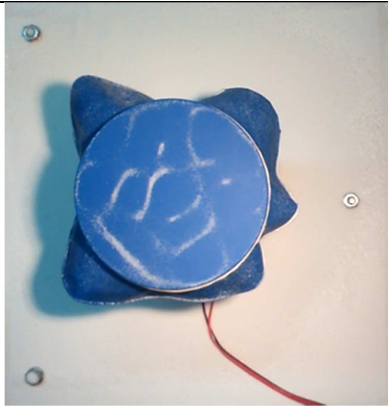
680		
688		
707	<p data-bbox="563 947 730 987">volum baix</p>  <p data-bbox="563 1361 707 1402">volum alt</p> 	

717		
732		
751		
756	<p>volum baix</p>  <p>volum alt</p>	

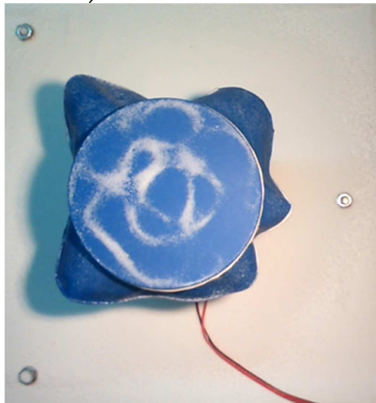
		
		
764		
776		

781		
787		
795		
798		

806	
<p>814*</p> <p>2 triangles i 6 punxes</p> <p>sembla k canvia amb volum baix i alt però no ho sé veure bé</p> <p>potser pk es una transició?</p>	<p>volum baix</p>  <p>volum alt des del principi</p> 
818	<p>poca sal</p> 

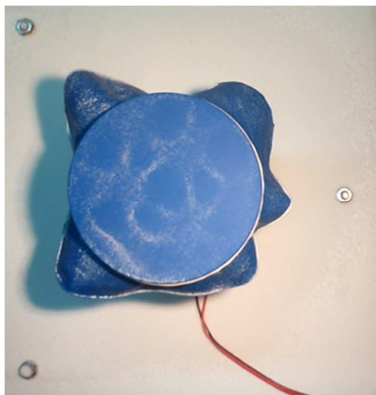


més sal (no he canviat el volum respecte la segona foto!!!)

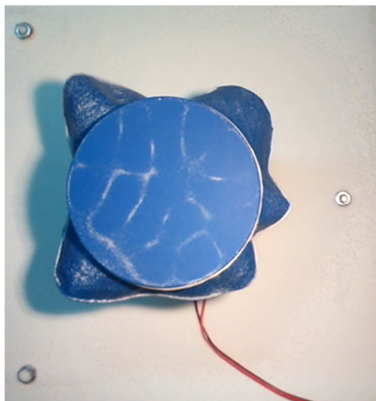


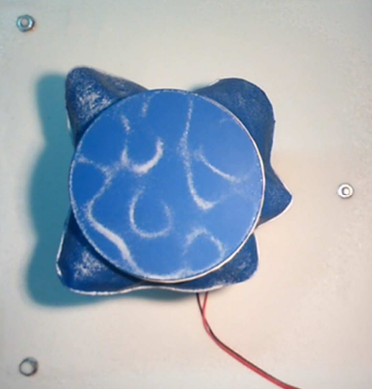
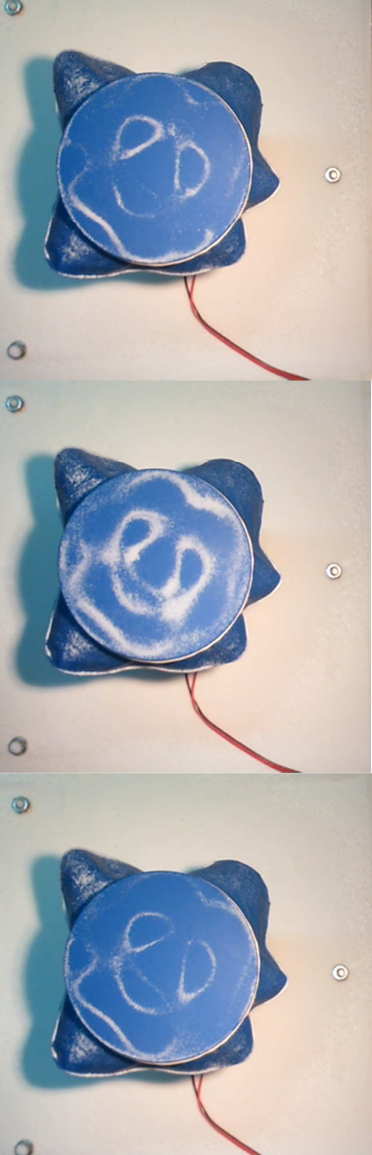
820

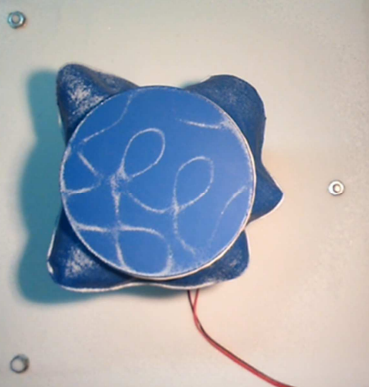
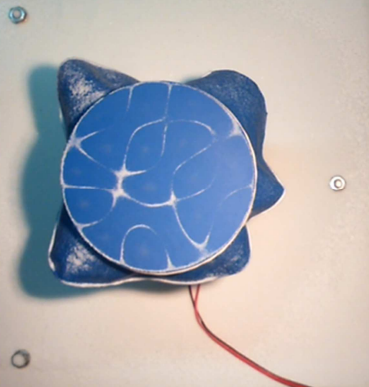
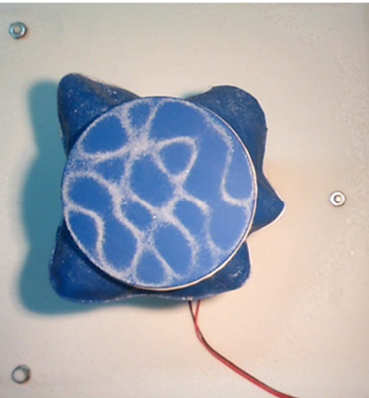
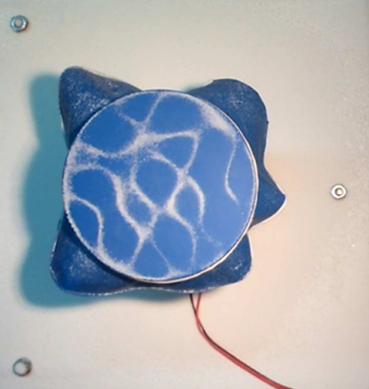
volum baix

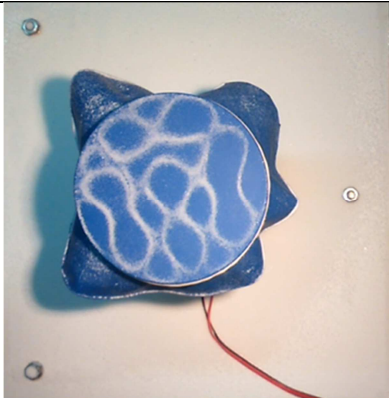
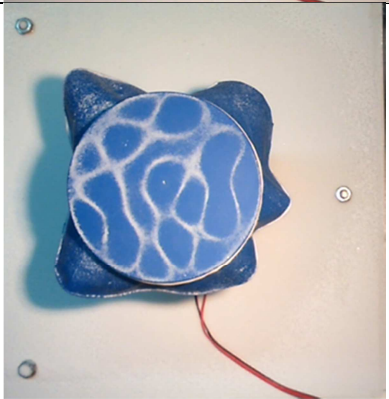
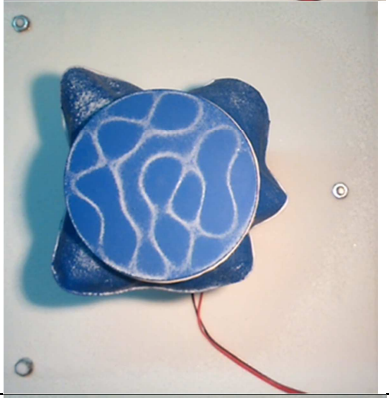
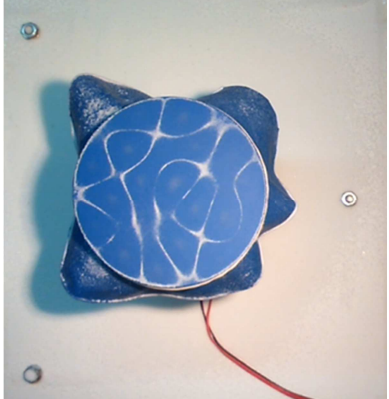


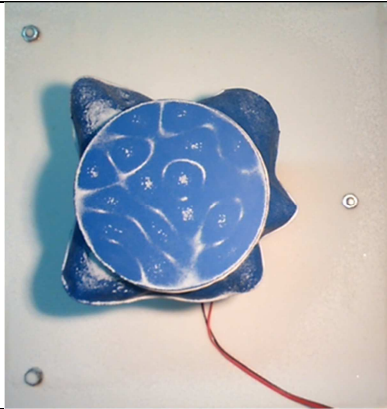
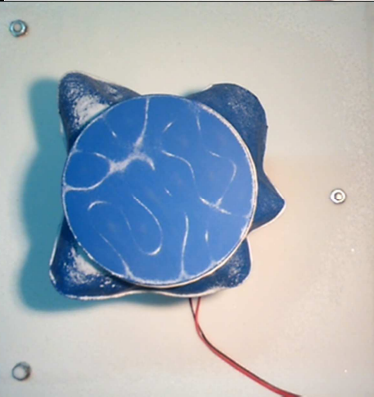
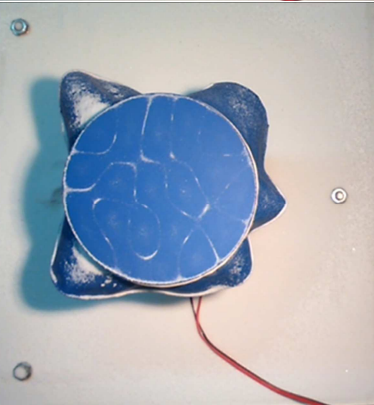
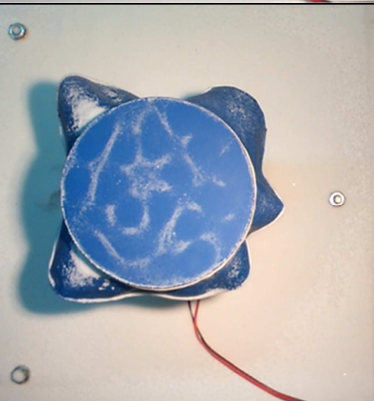
volum alt

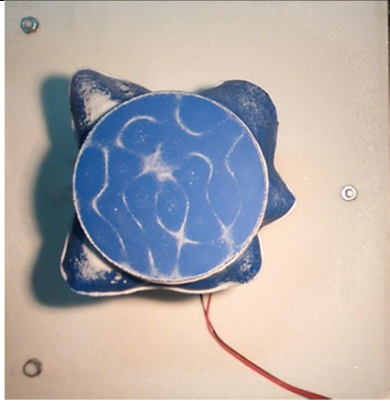
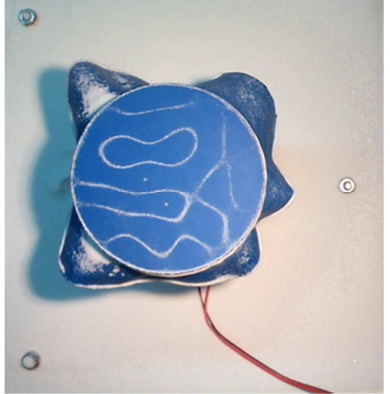
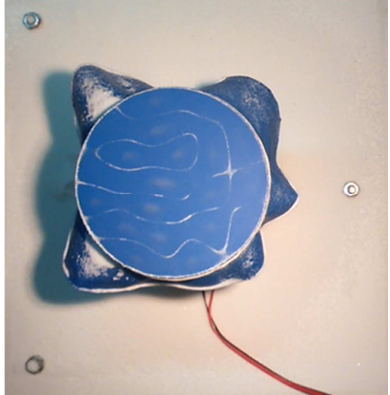
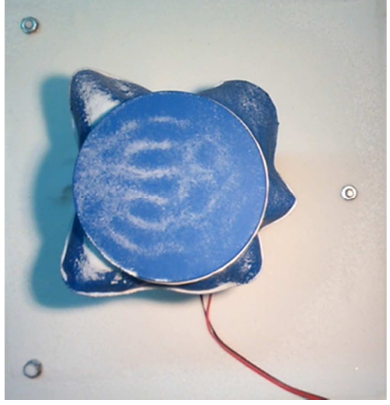


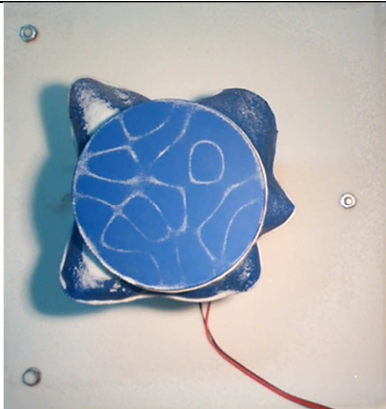
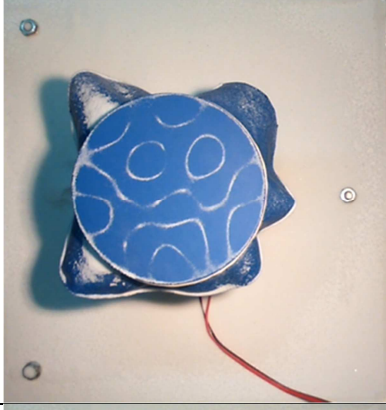
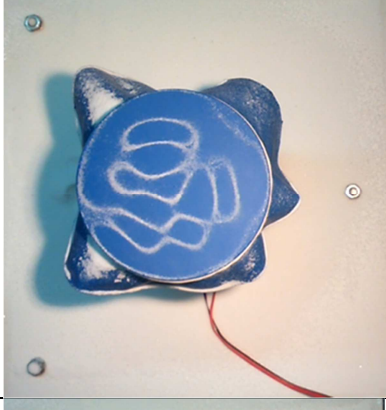
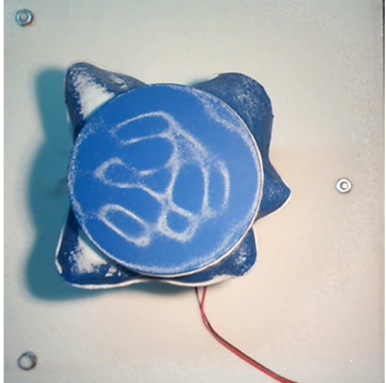
822		
<p>833</p> <p>pot ser que sigui la mateixa que l'anomenada "lletra C"</p>		

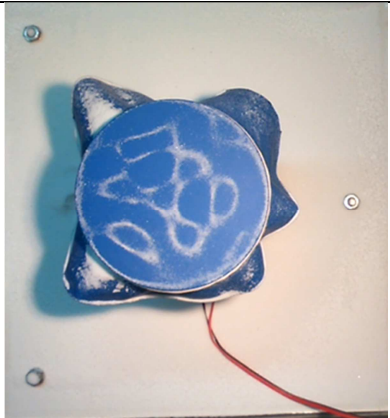
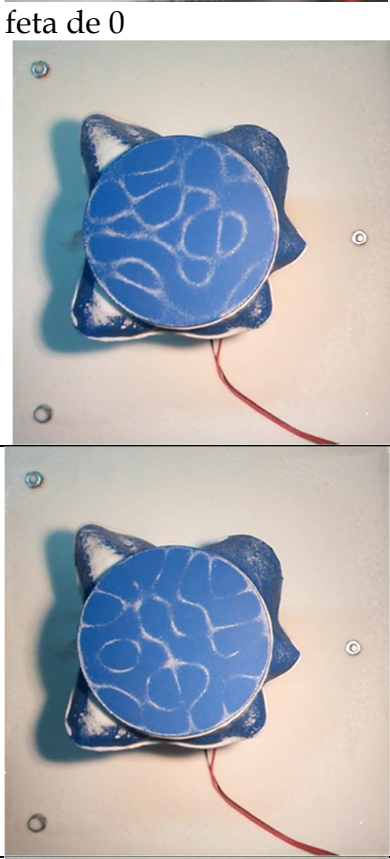
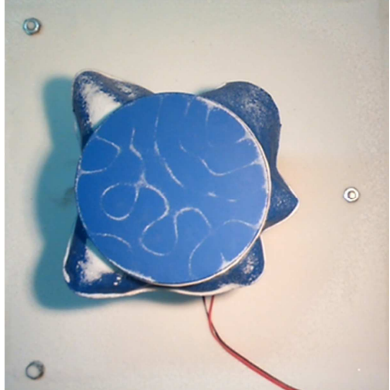
<p>857</p> <p>la lletra M</p>		
<p>865</p>		
<p>875</p>	<p>volum baix</p>  <p>volum alt distorciona</p>	
<p>887 ===</p>		

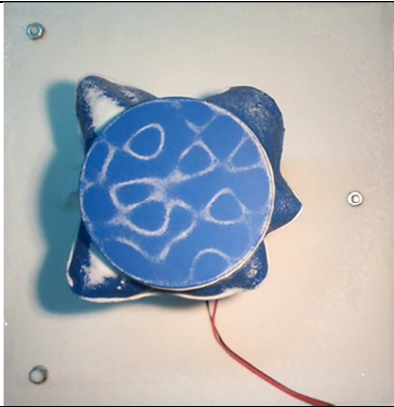
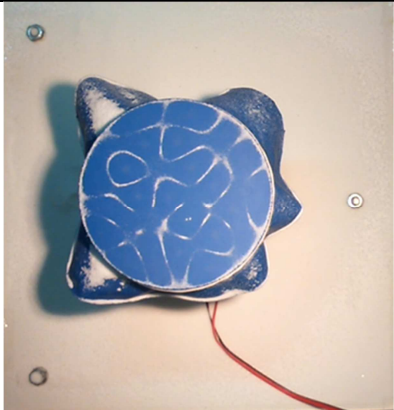
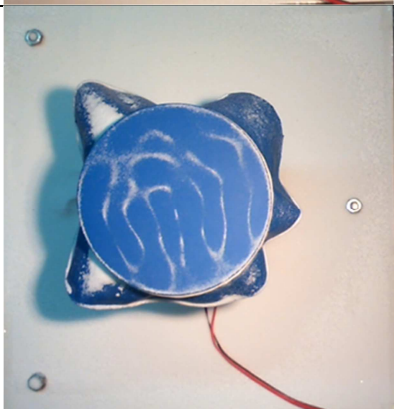
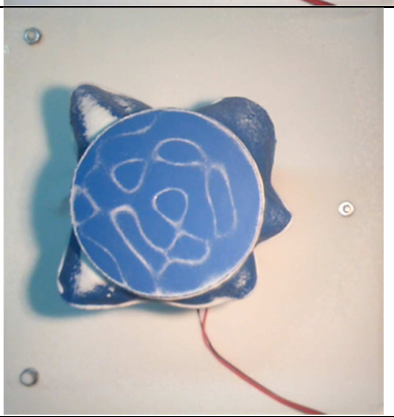
		
<p>899</p> <p>tot i que la forma és pràcticament igual, canvia l'eix de simetria!!! Potser no.. Transició???</p>	 	
<p>911</p>	 <p>feta des de 0</p>	

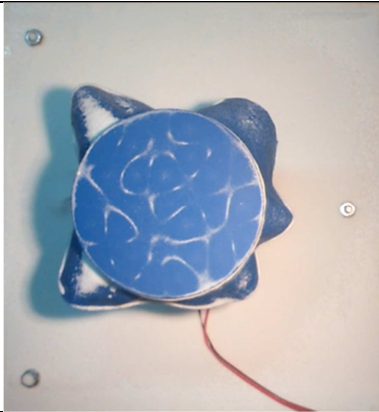
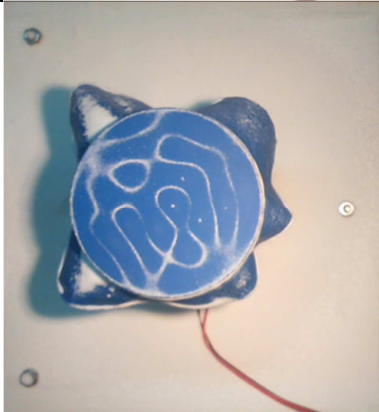
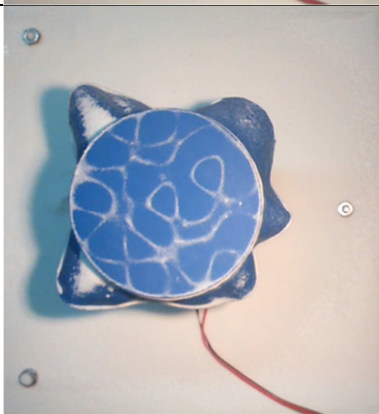
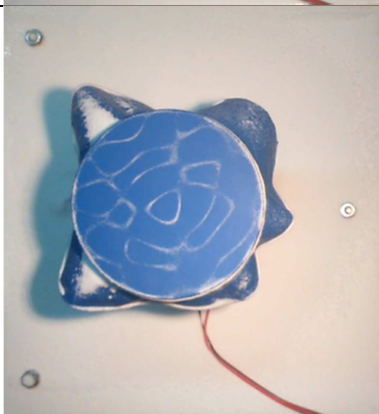
		
919		
923		
924 transició		

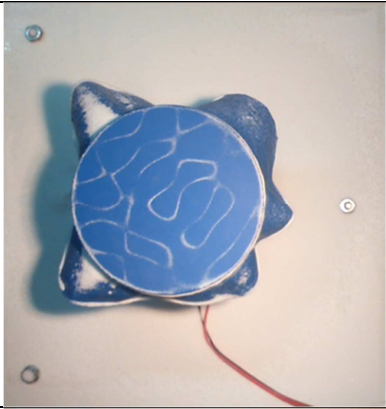
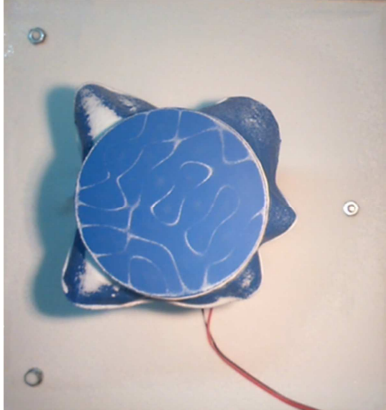
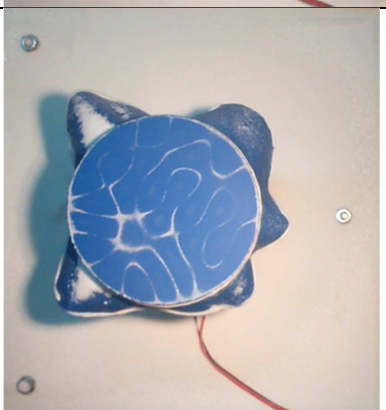
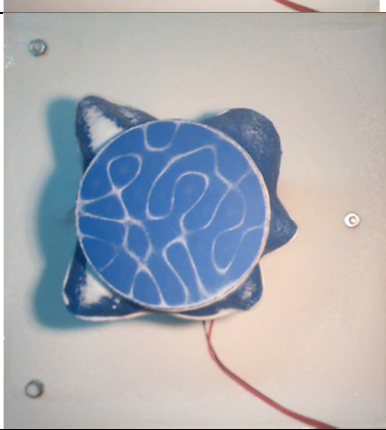
<p>934</p> <p>l'home?</p>		
<p>947</p>		
<p>956</p>		
<p>970</p>	<p>volum baix</p>  <p>volum alt</p>	

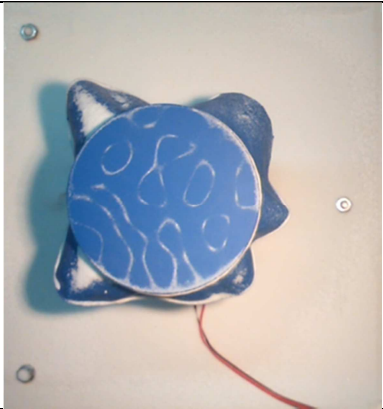

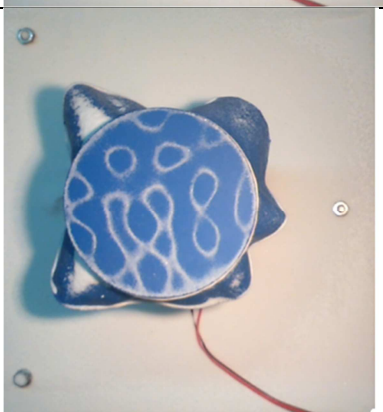
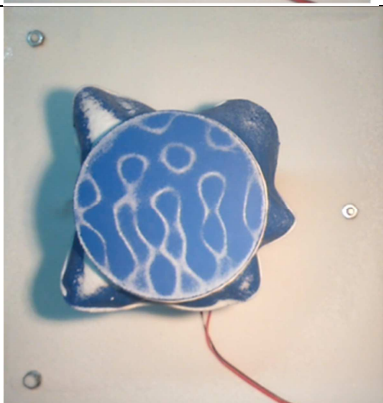
		
976		
992 transició?		
1008		

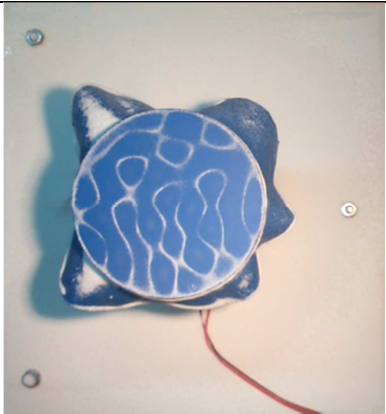
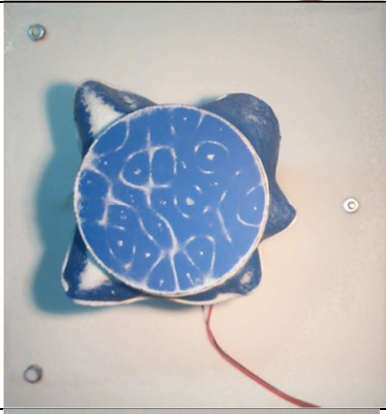
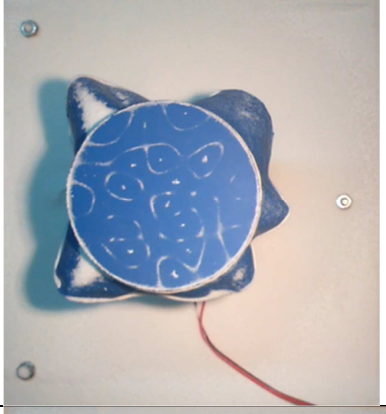
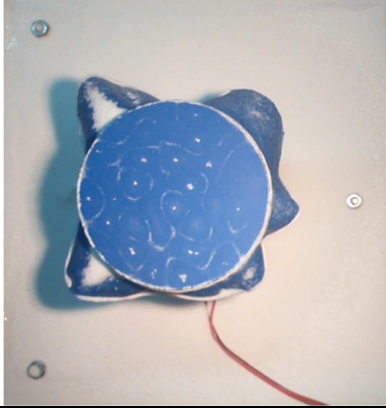
<p>1021</p>		
<p>1030</p> <p>transició</p>	<p>feta de 0</p> 	
<p>1032</p>		

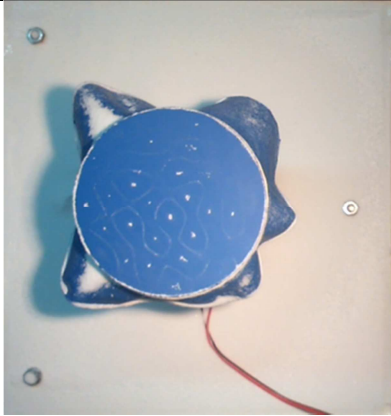
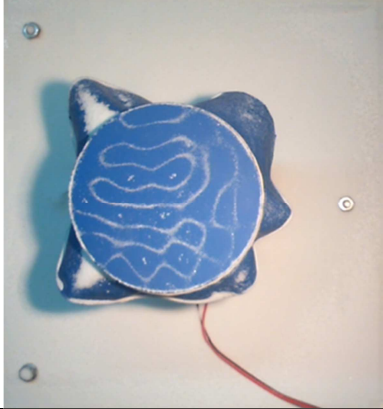
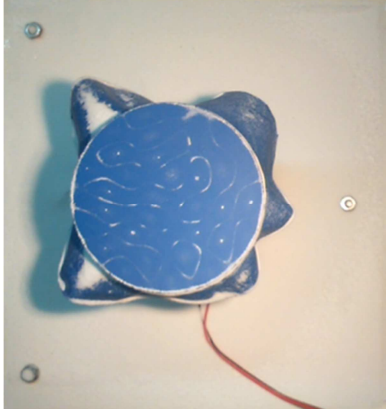
1039		
1046		
1057		
*** (=1084)		

1082		
1084		
1089		
1101		

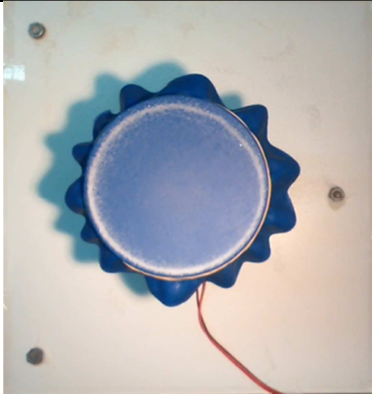
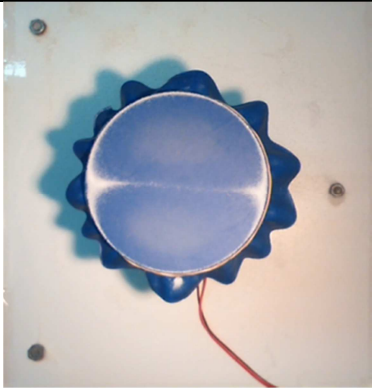
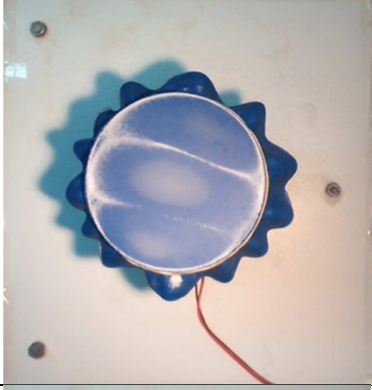
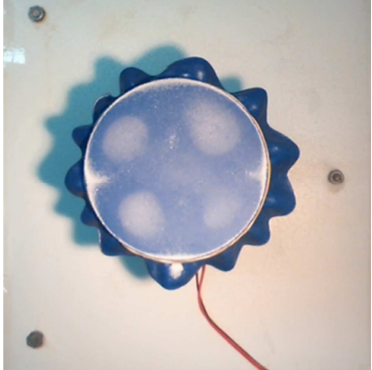
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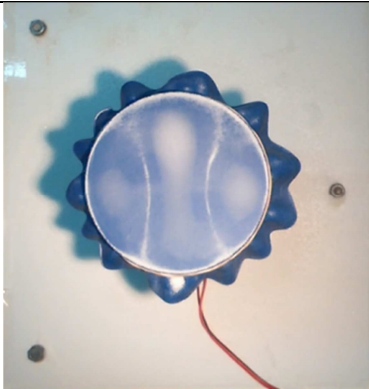
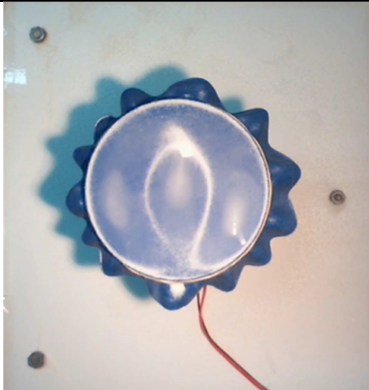
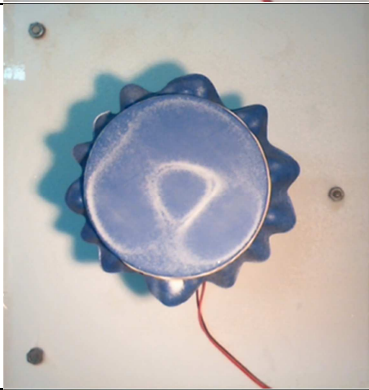
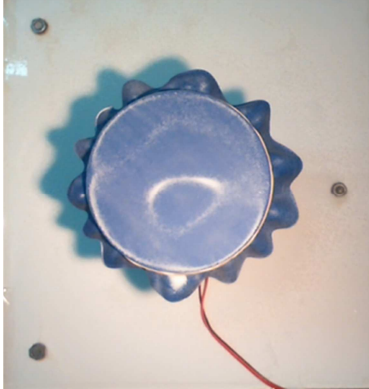
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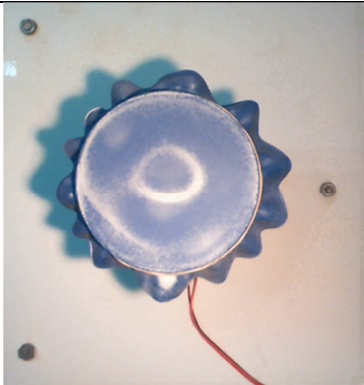
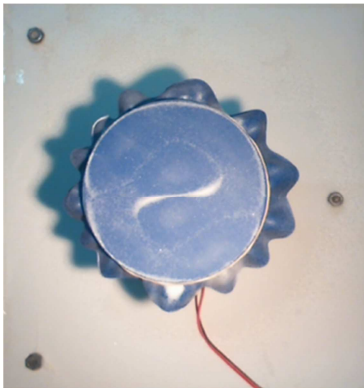
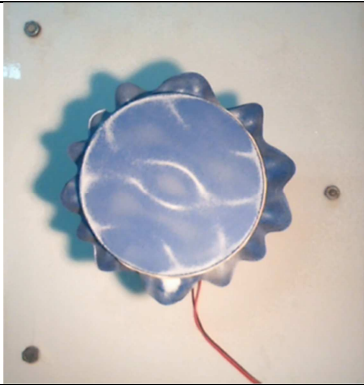
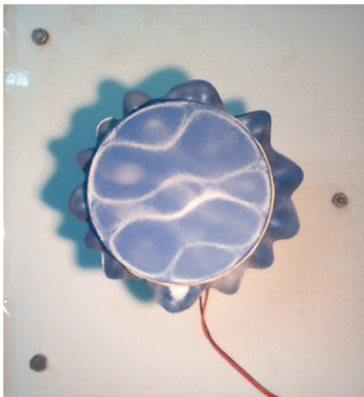
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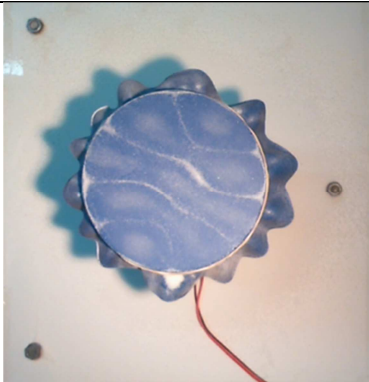
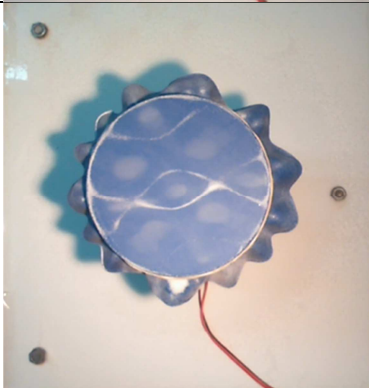
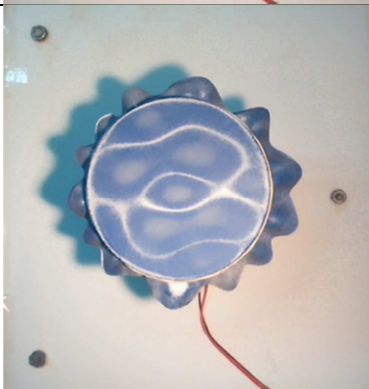
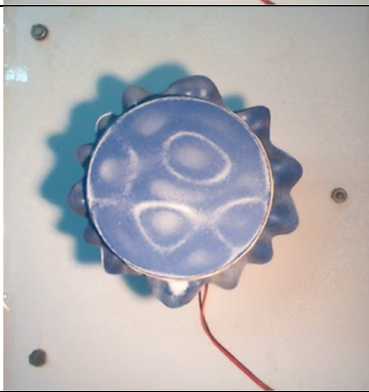
		
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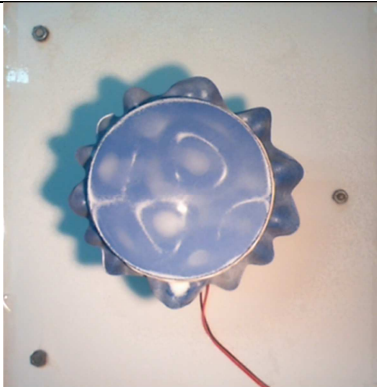
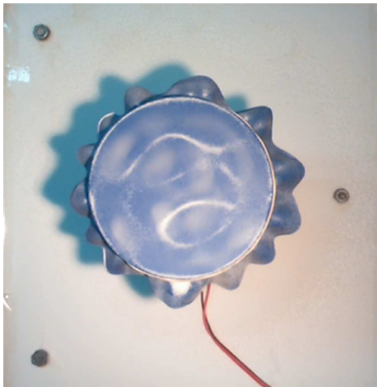
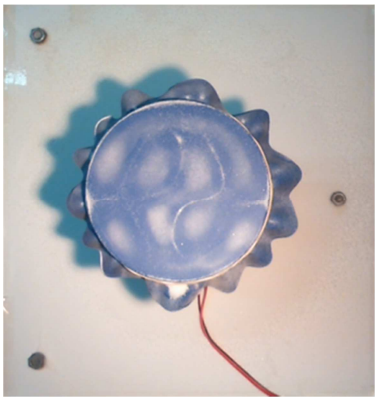
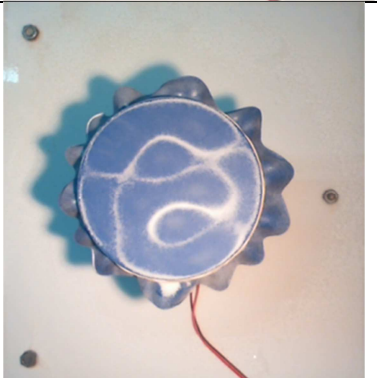
Annex 3: Membrana 3

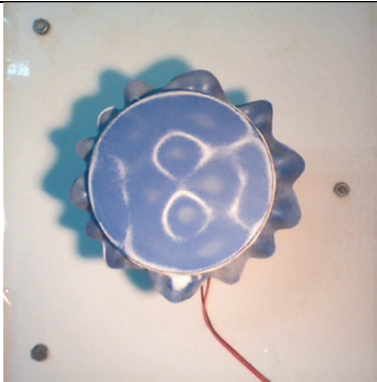
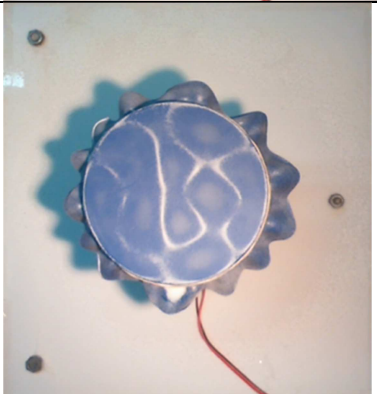
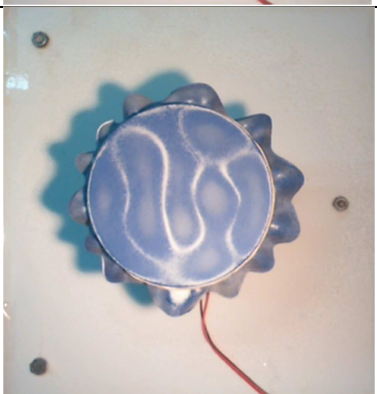
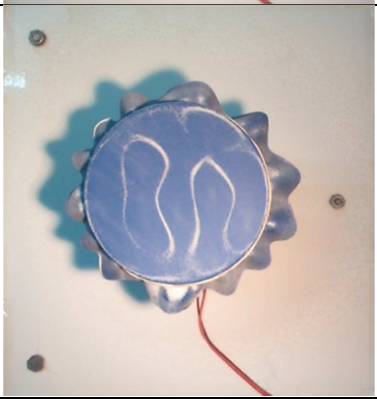
Membrana 3		
Freqüència (Hz)	Imatge	
72		
95 inestable		
126 estable		
130 inestable		

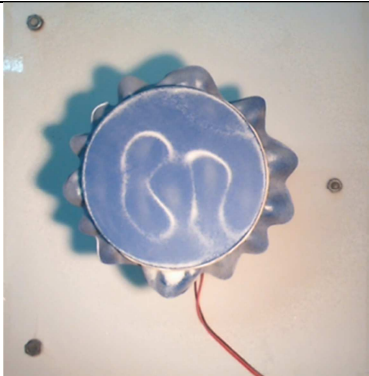
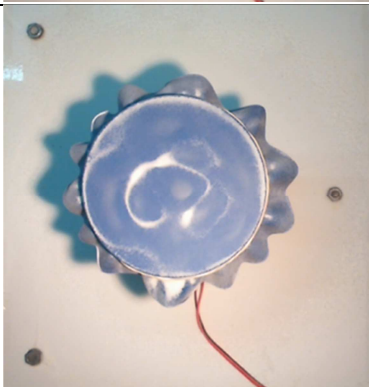
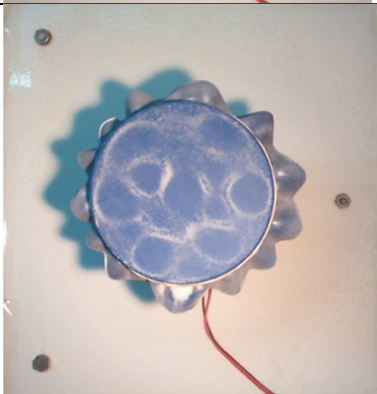
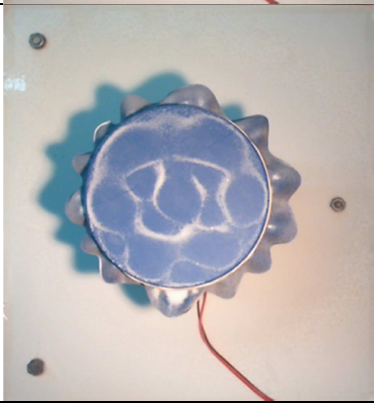
141		
147		
166		
175		
177 inestable	volum baix	

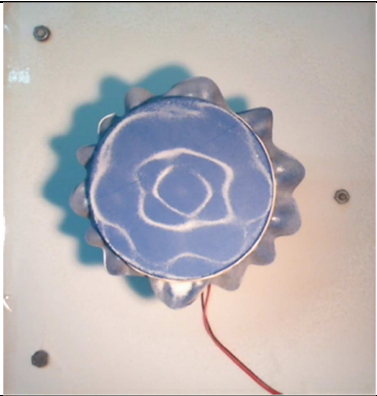
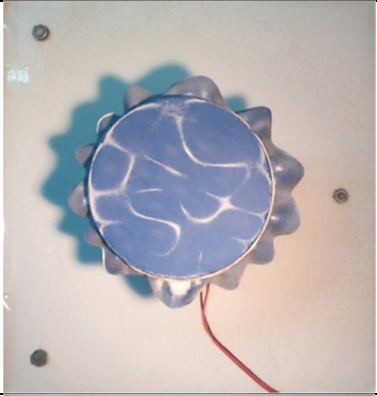
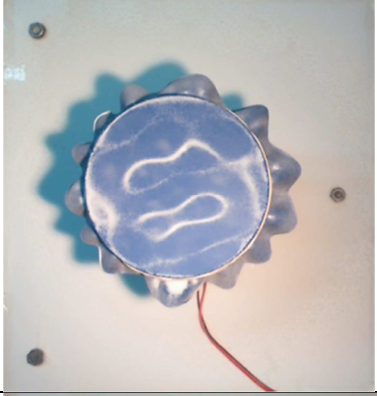
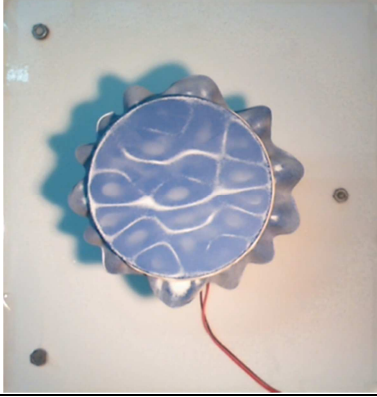
	 <p>volum alt</p> 	
195		
198 inestable	<p>volum baix</p>  <p>volum alt</p>	

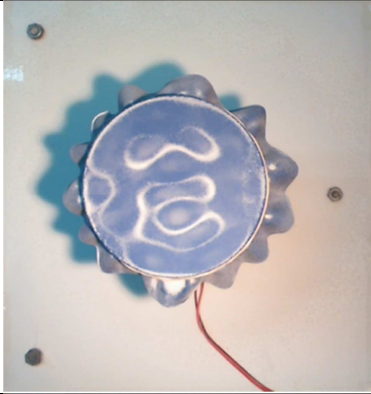
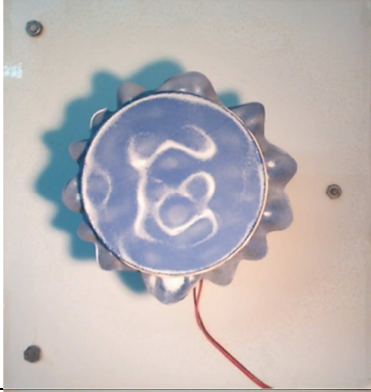
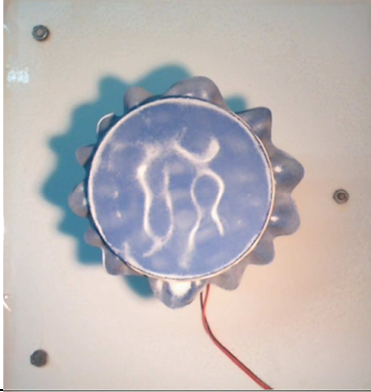
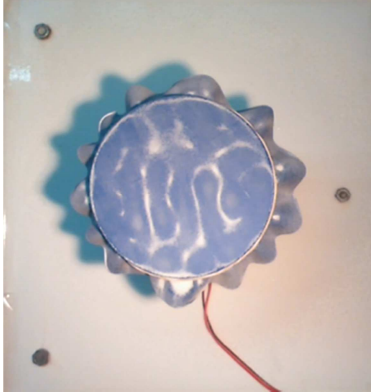
		
201 estable		
206		
215		

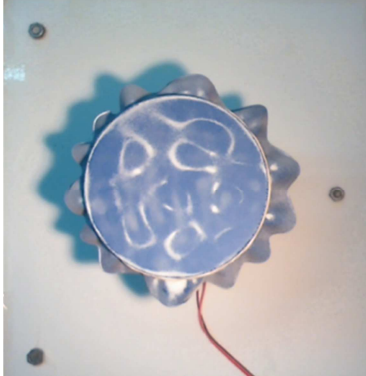
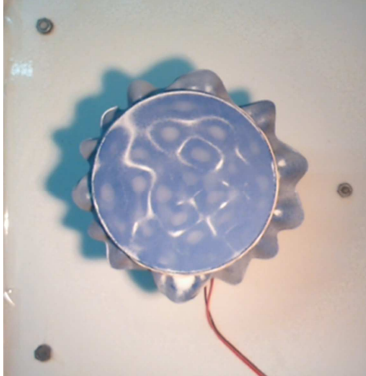
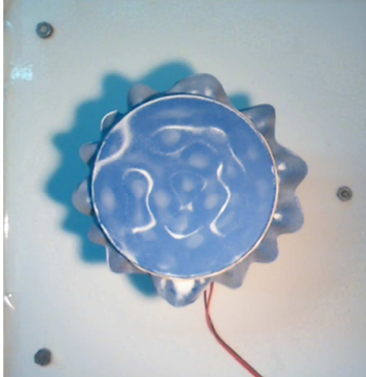
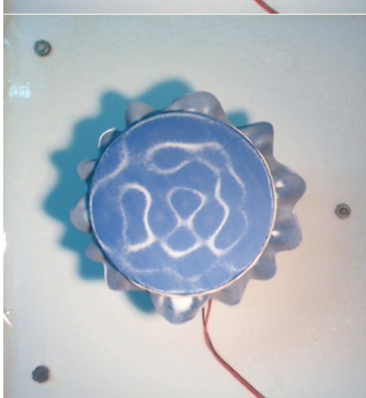
217	
220 inestable	<p data-bbox="576 573 719 607">volum baix</p>  <p data-bbox="576 992 703 1025">volum alt</p> 
223 estable	

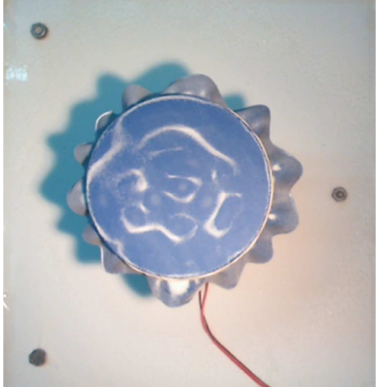
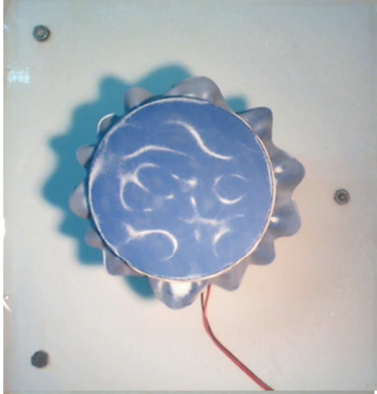
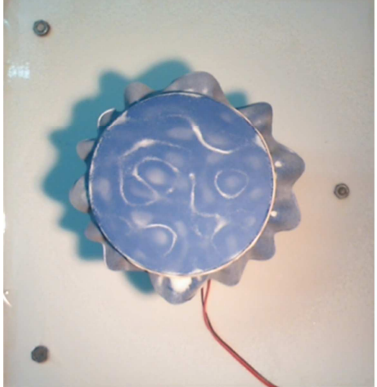
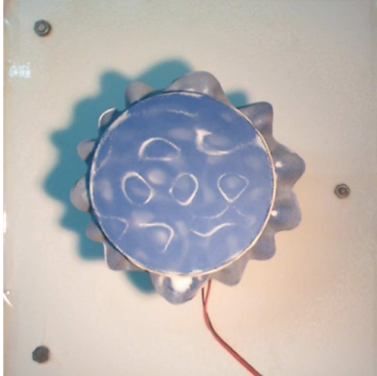
228		
232 lleugerament inestable		
235 lleugerament inestable		
238		

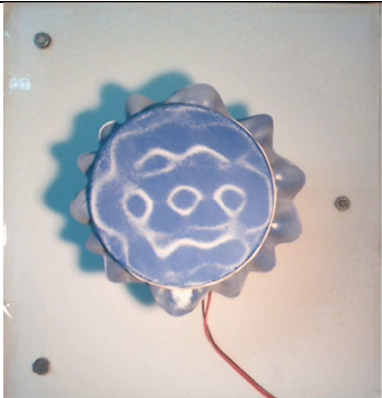
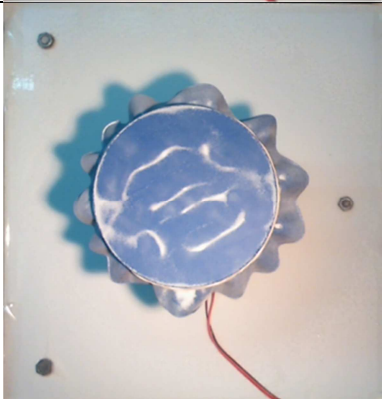
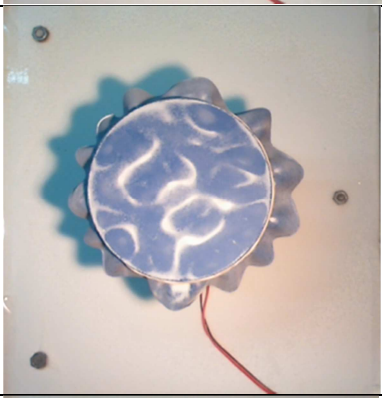
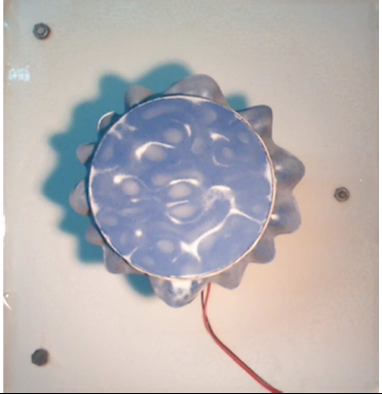
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254		
261 inestable		
268		

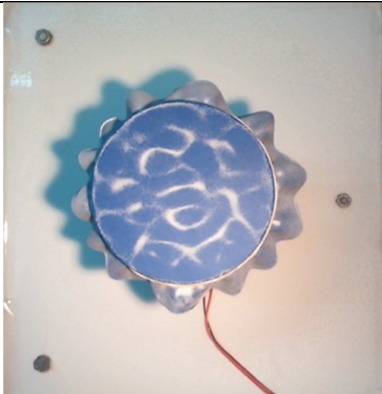
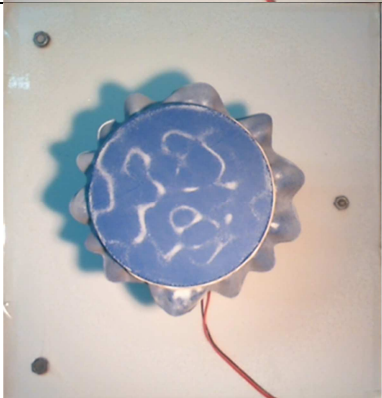
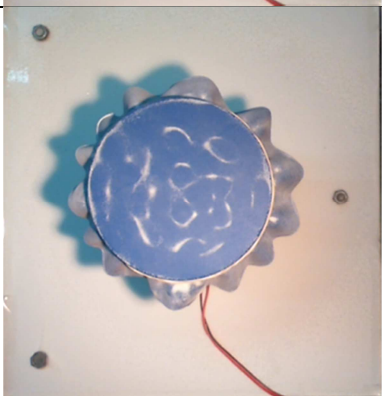
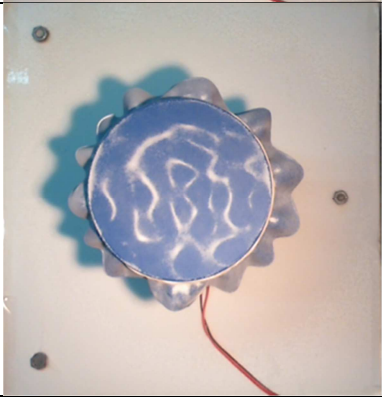
272		
280		
289 estable		
298		

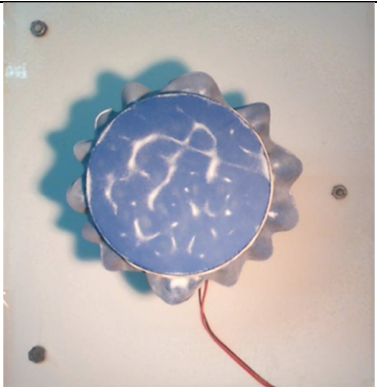
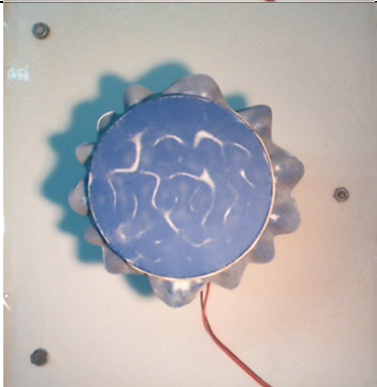
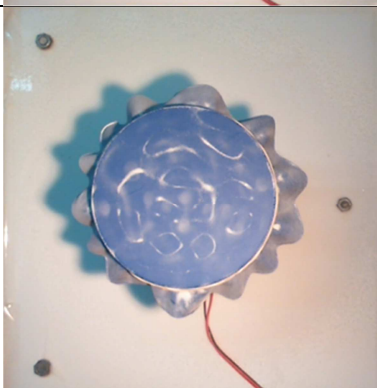
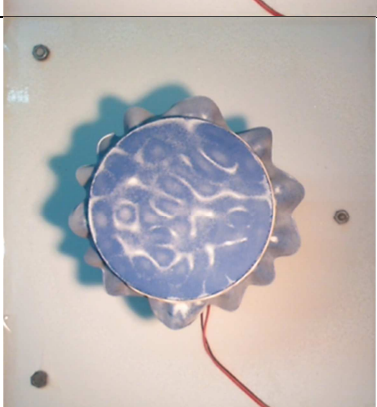
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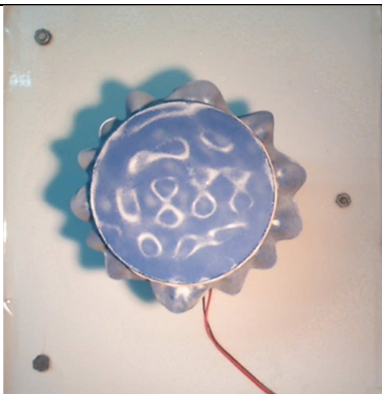
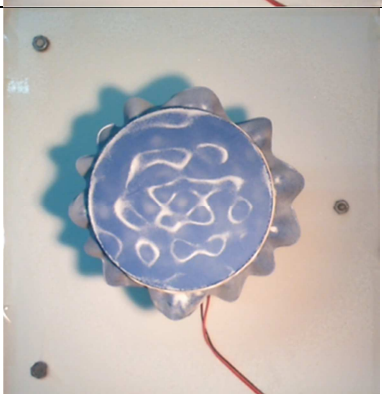
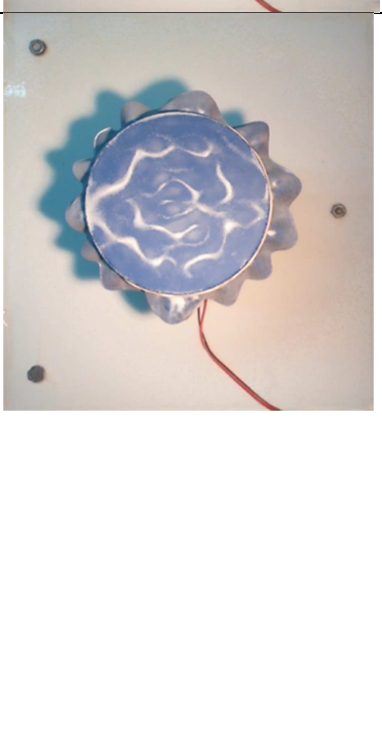
334		
338		
341 estable	 	

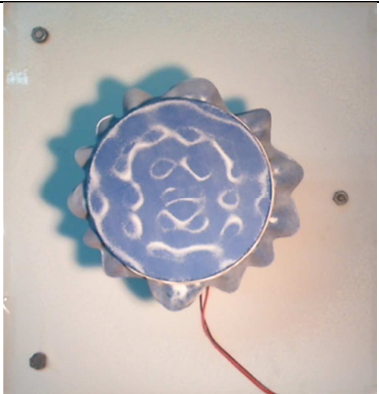
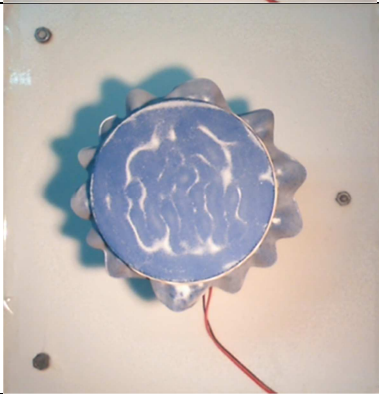
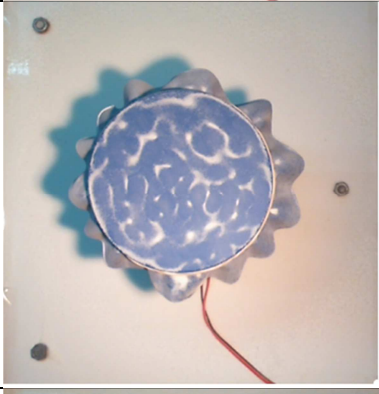
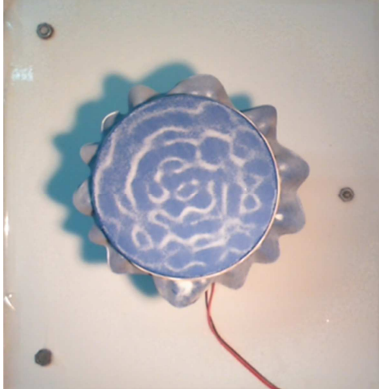
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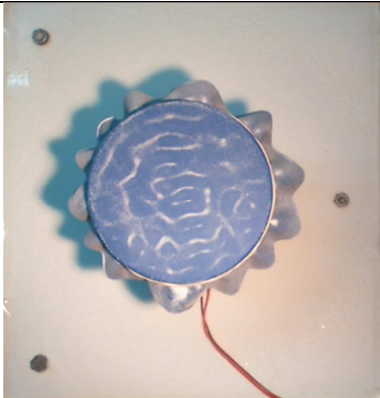
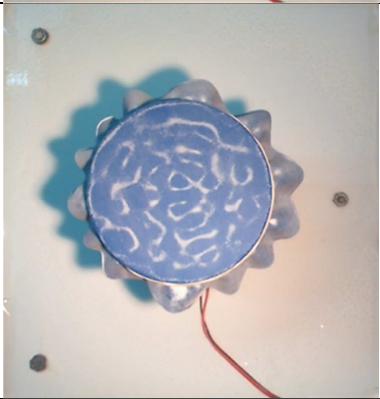
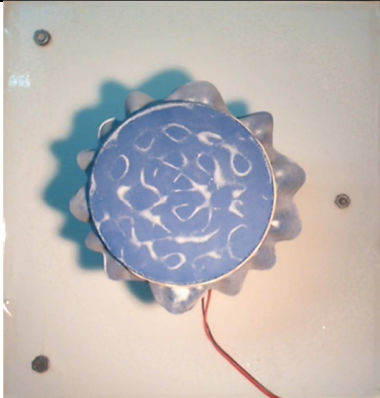
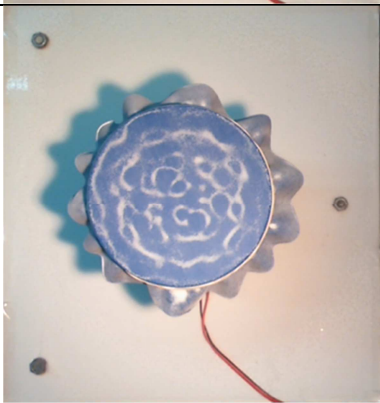
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392		

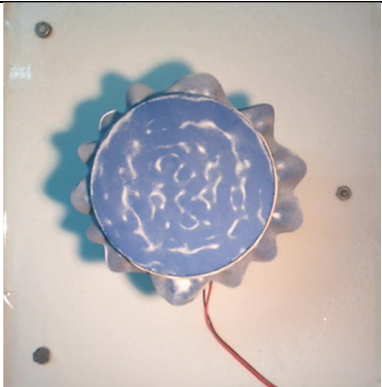
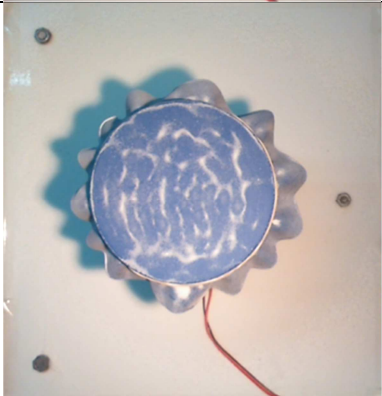
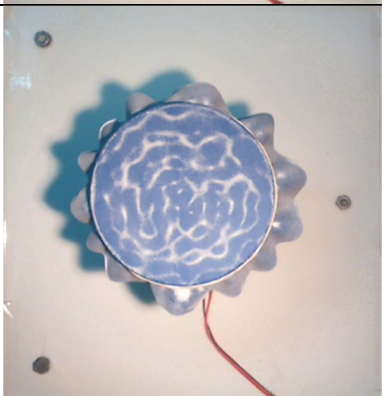
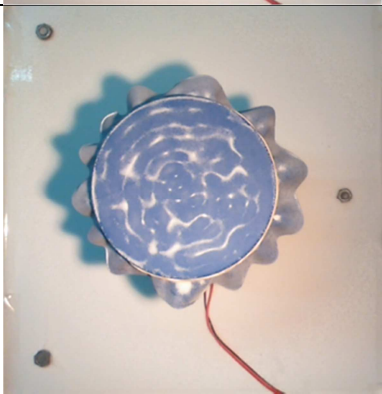
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420		

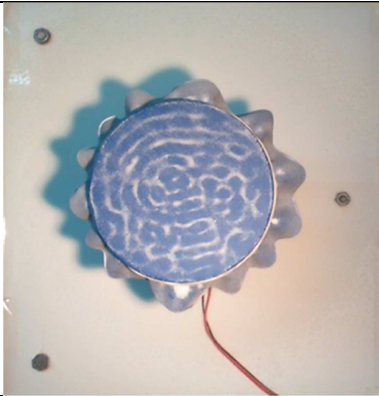
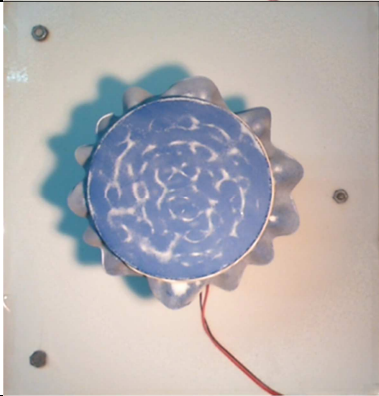
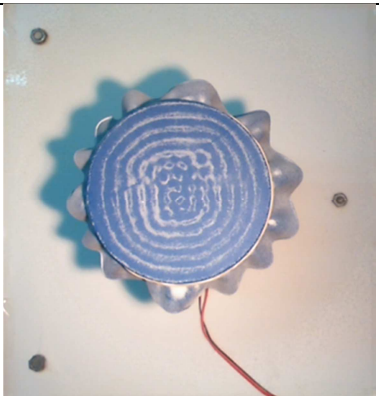
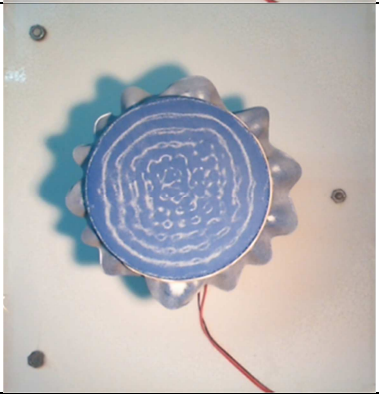
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446	
462	
477	

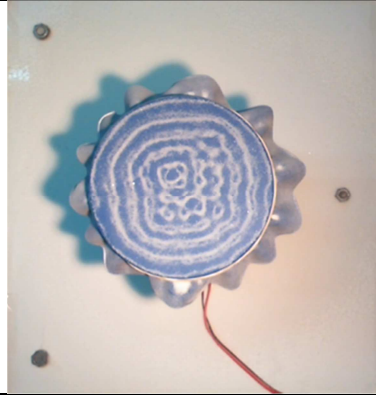
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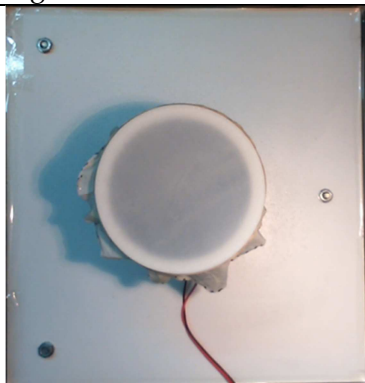
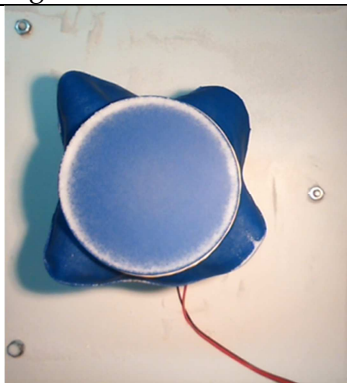
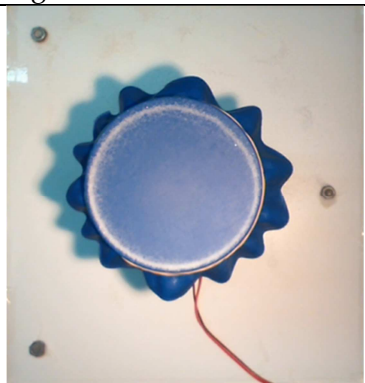
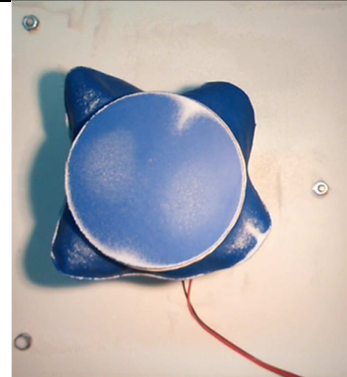
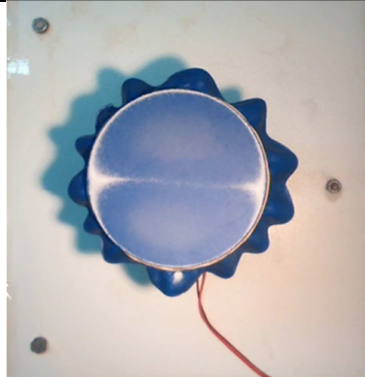
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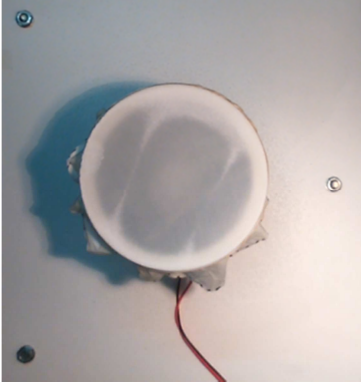
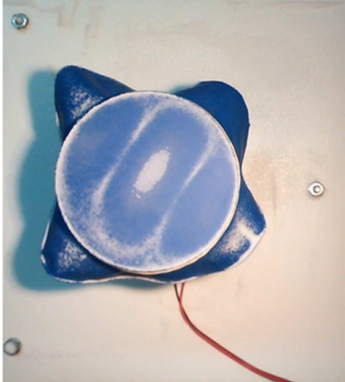
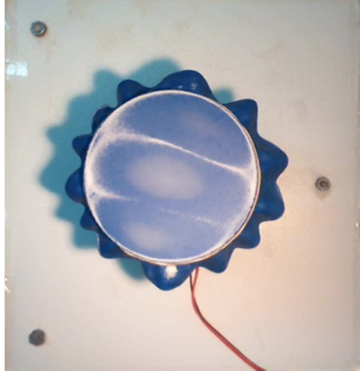
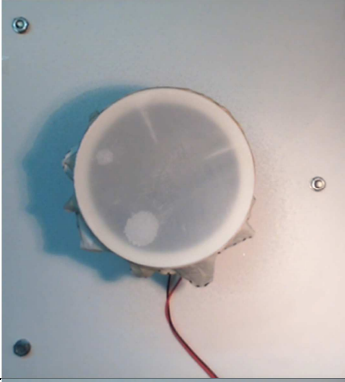
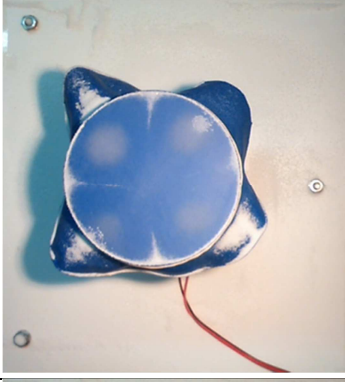
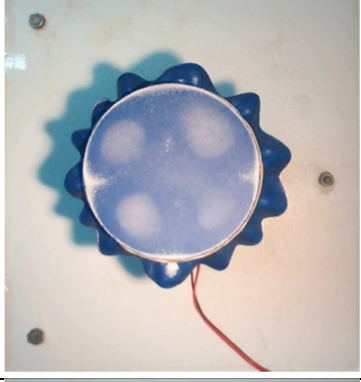
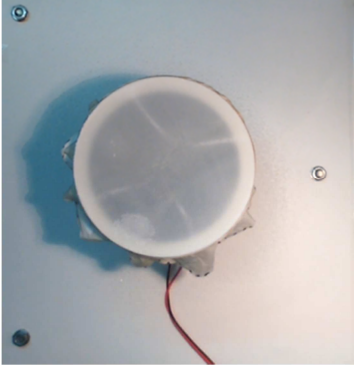
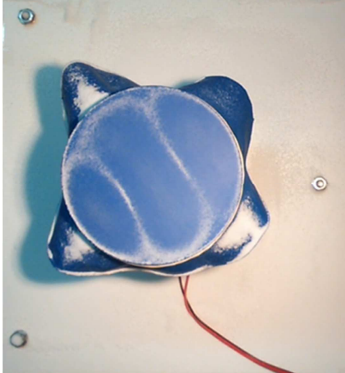
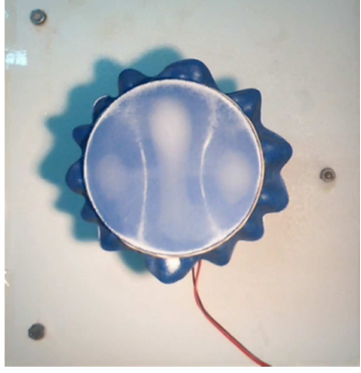
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1400		
1211		

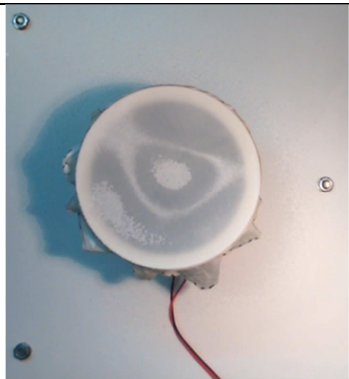
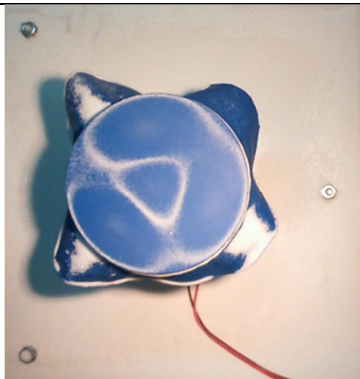
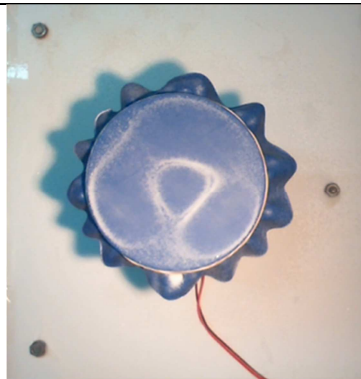
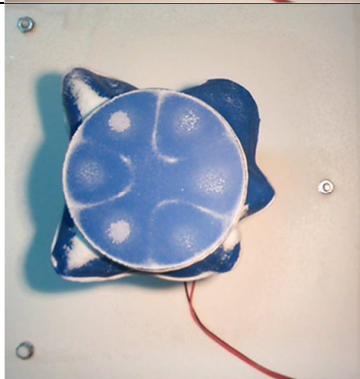
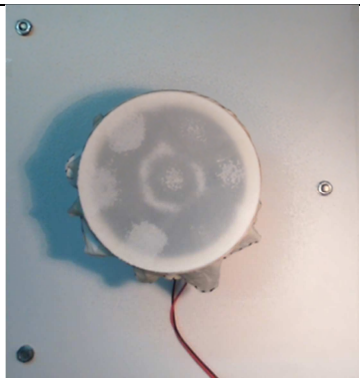
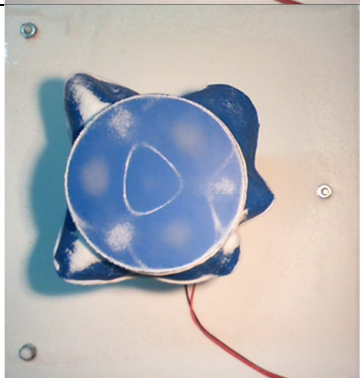
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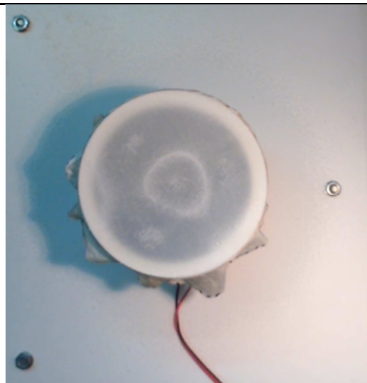
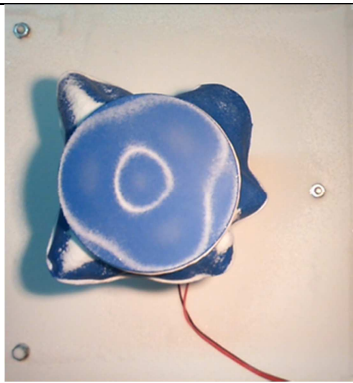
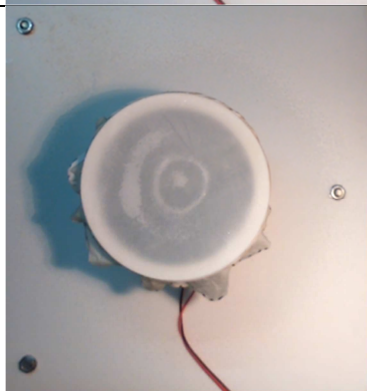
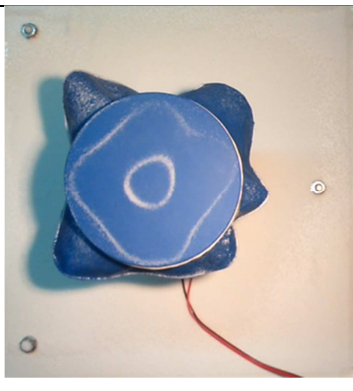
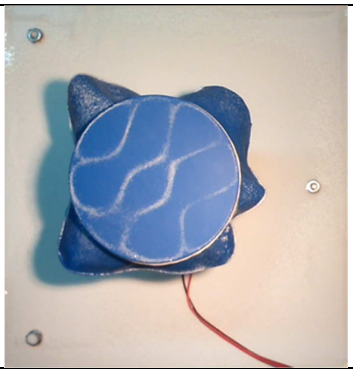
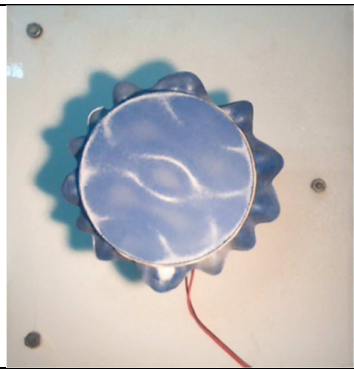


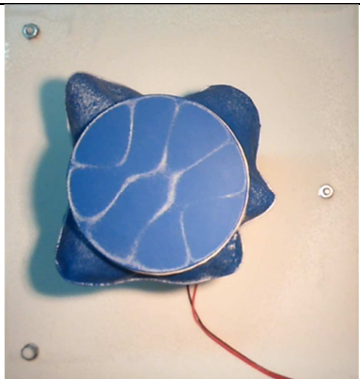
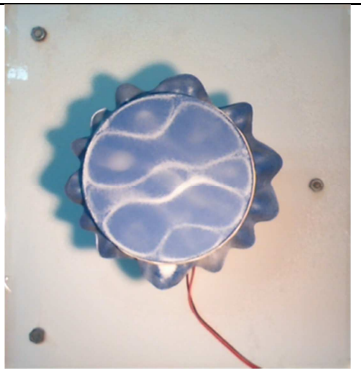
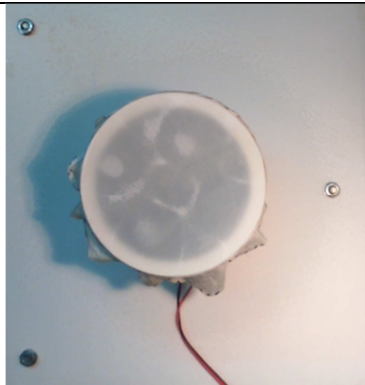
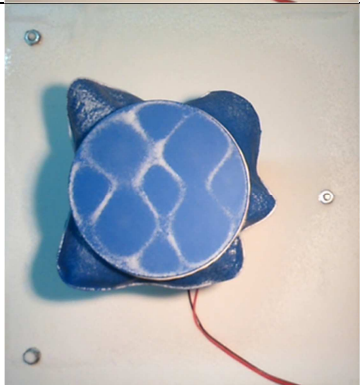
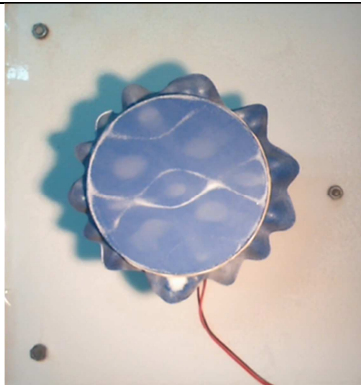
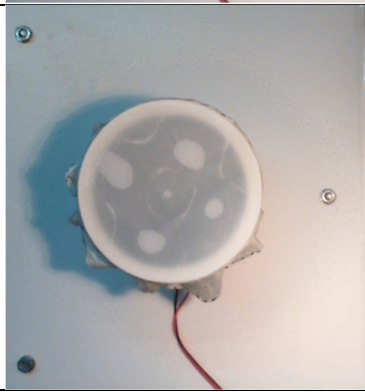
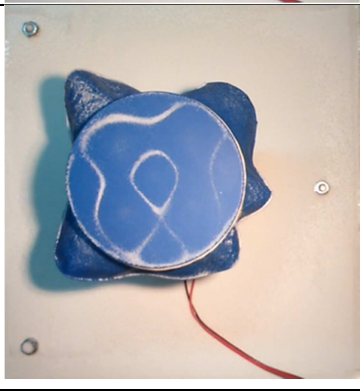
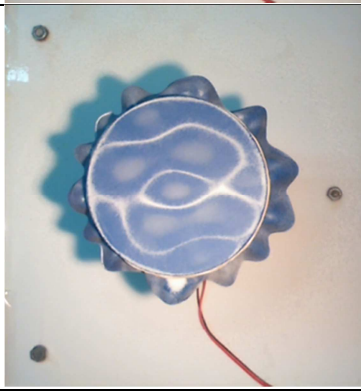
Annex 4: Comparació de les tres membranes

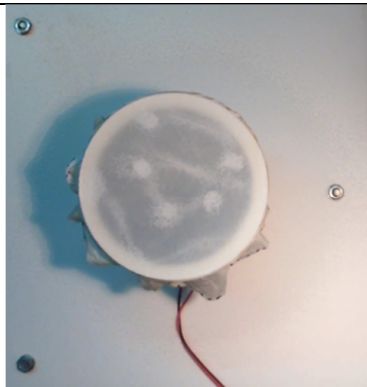
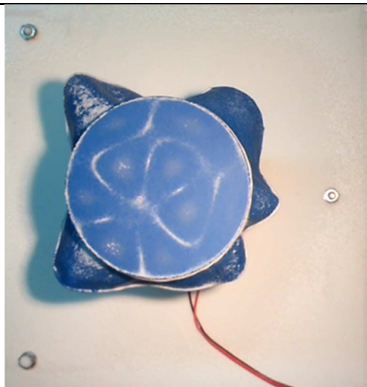
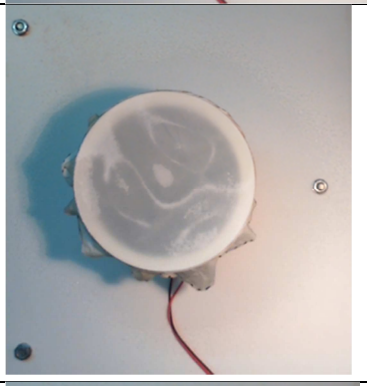
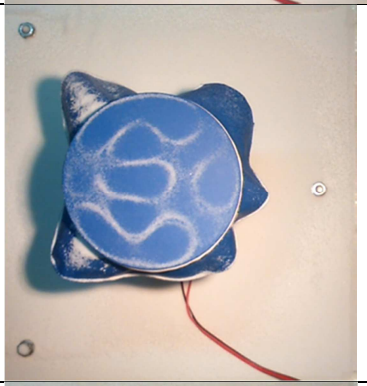
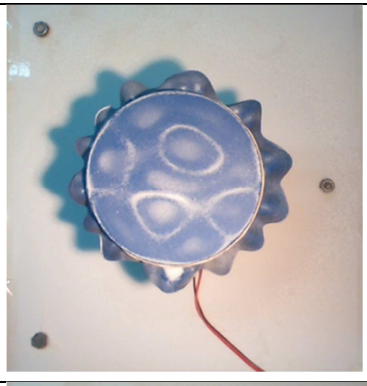
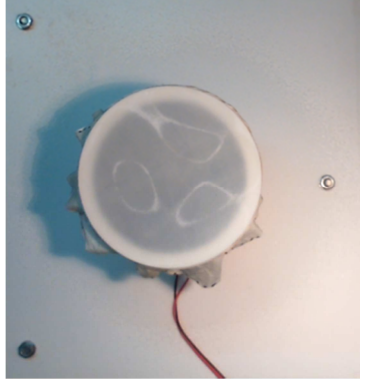
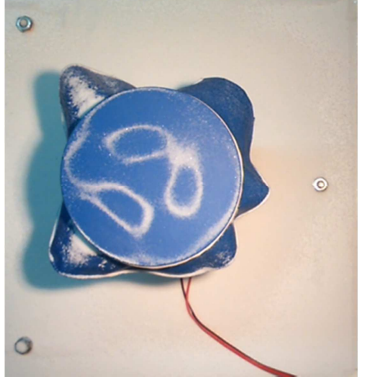
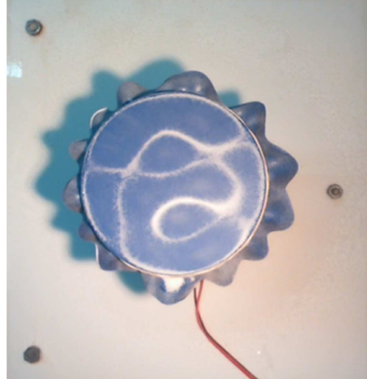
Membrana 1		Membrana 2		Membrana 3	
Freq.	Figura	Freq.	Figura	Freq.	Figura
50-250		40-270		72	
		276 inestable		95 inestable	

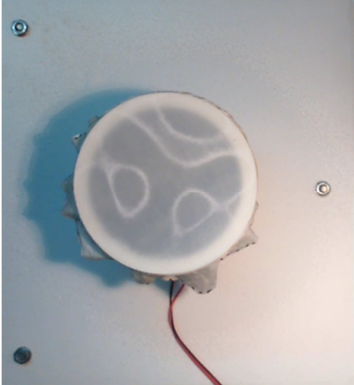
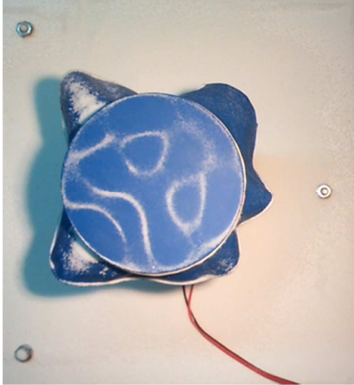
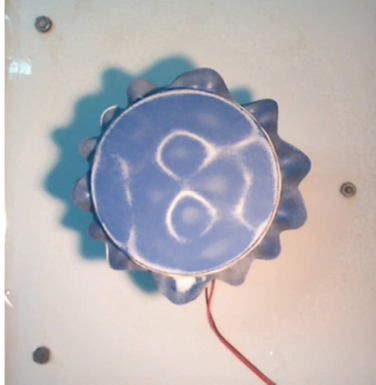
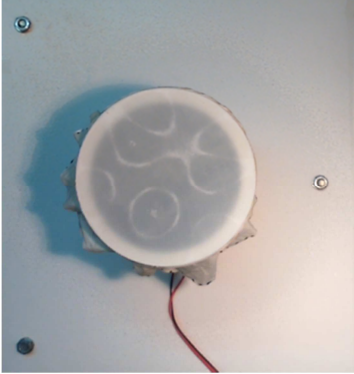
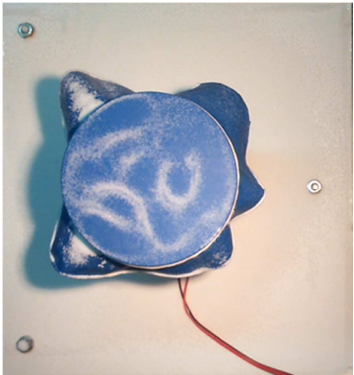
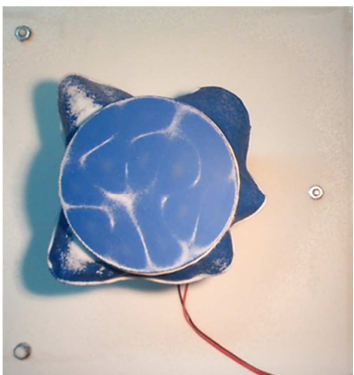
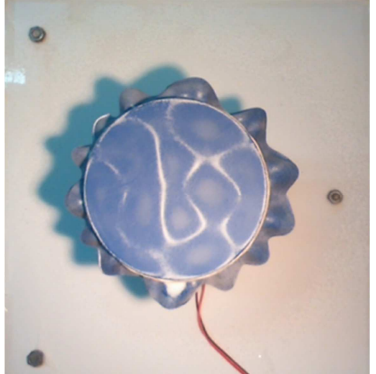
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317		386 inestable		130 inestable	
324		393-397		141	

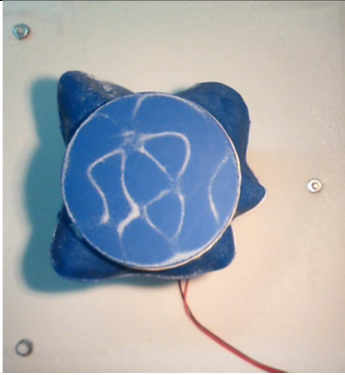
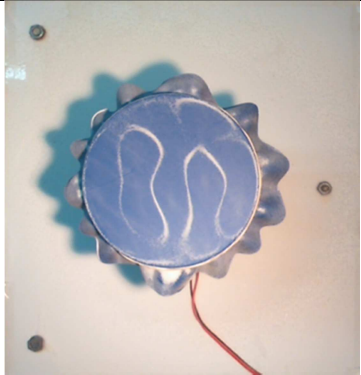
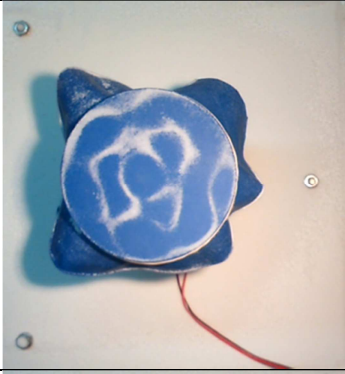
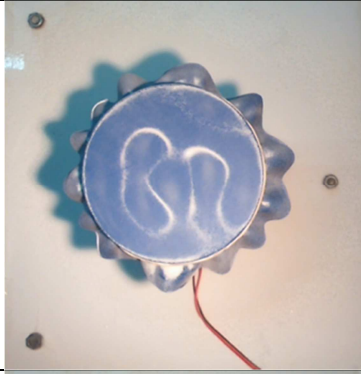
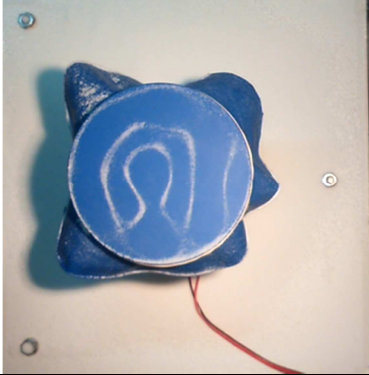
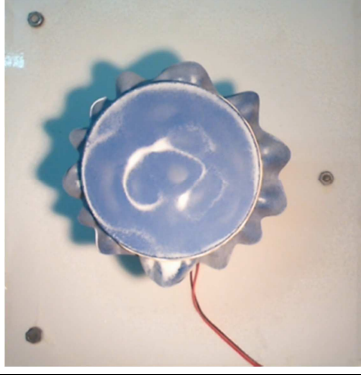
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		499			
434		506			

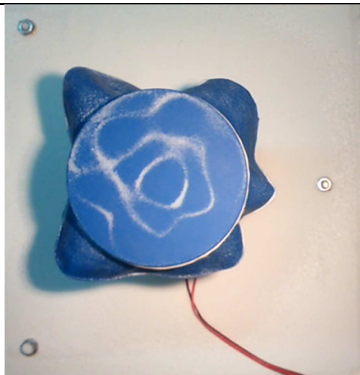
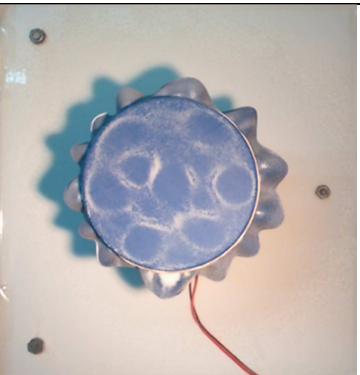
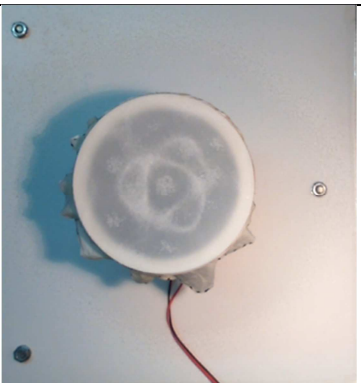
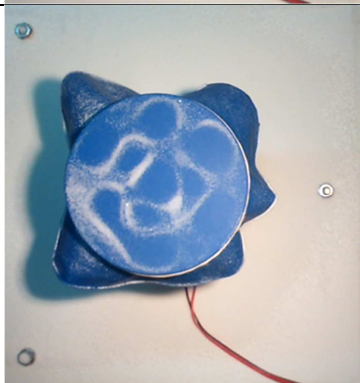
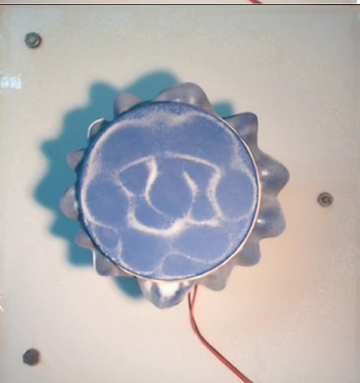
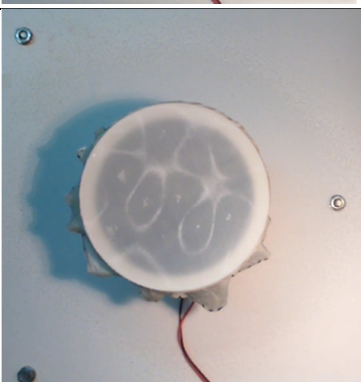
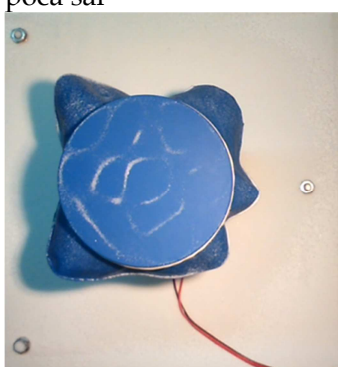
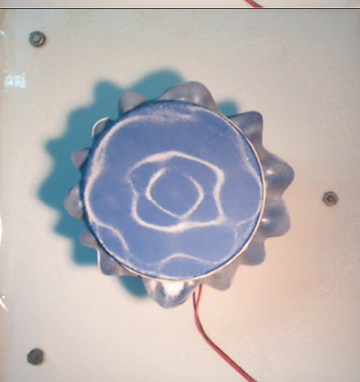
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		598		195	

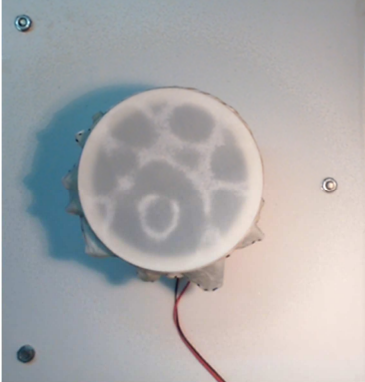
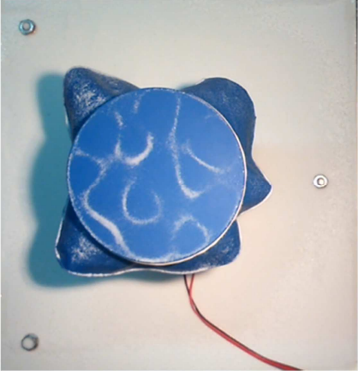
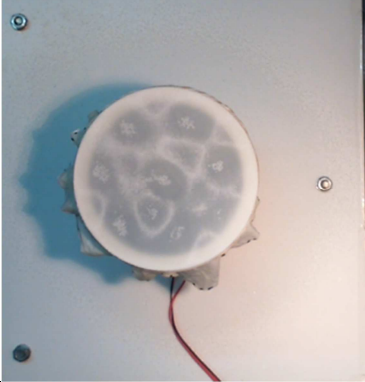
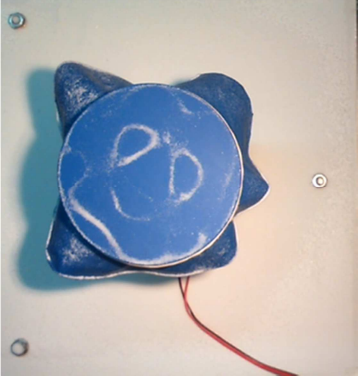
		602		198 inestable	
525		610		201 estable	
550		620		206	

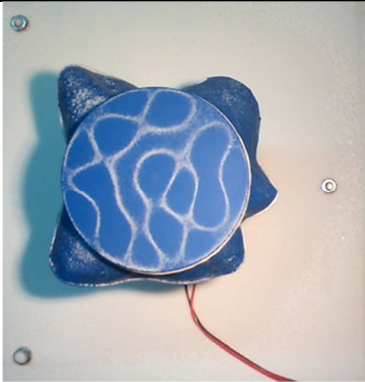
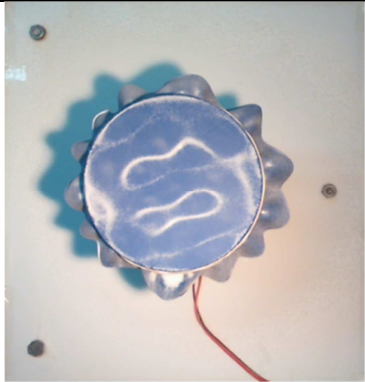
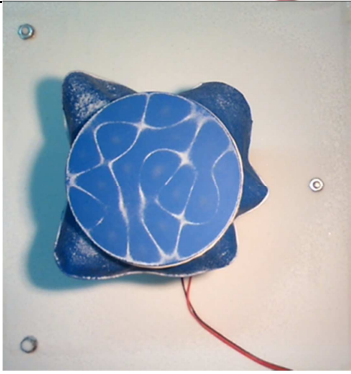
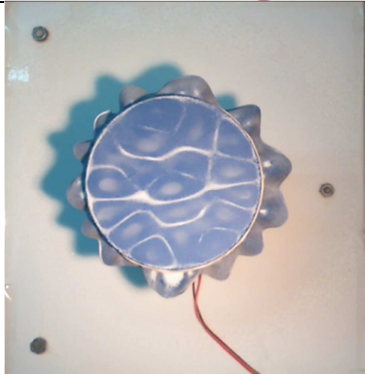
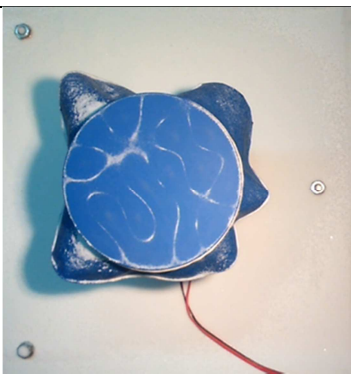
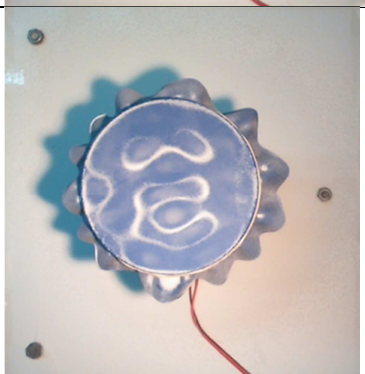
567		643			
628		707		215.217	
655		732		223 estable	

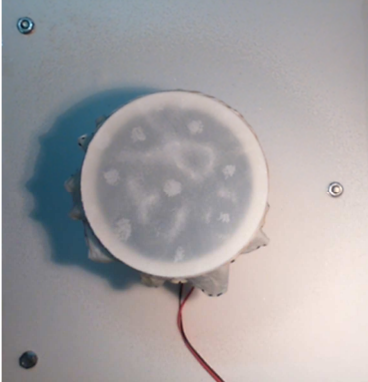
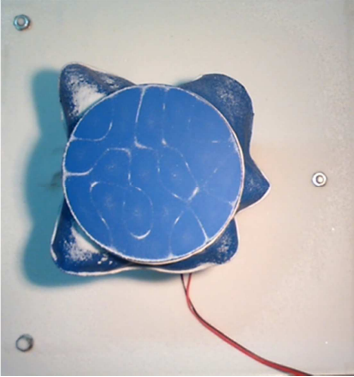
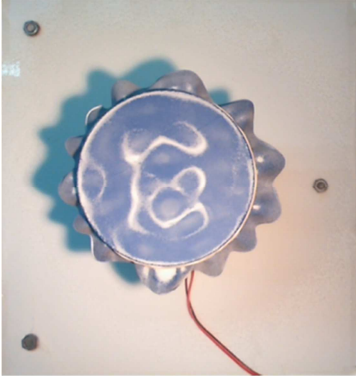
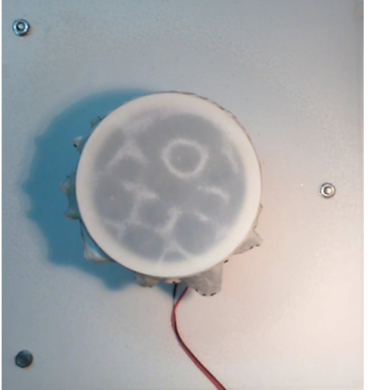
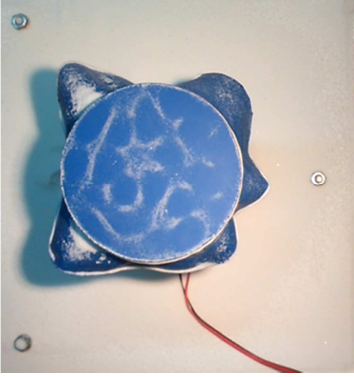
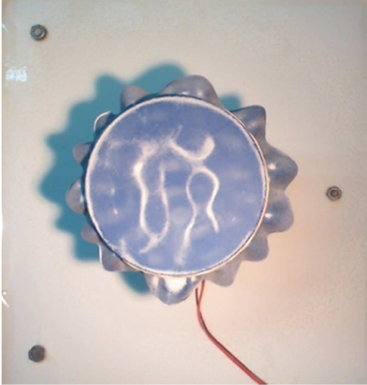
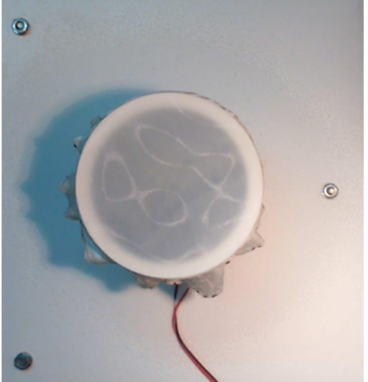
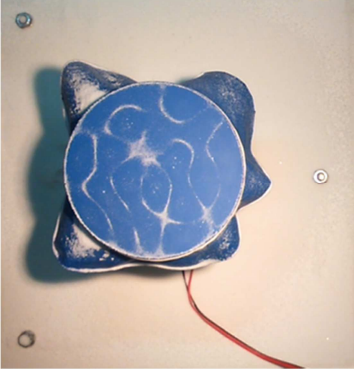
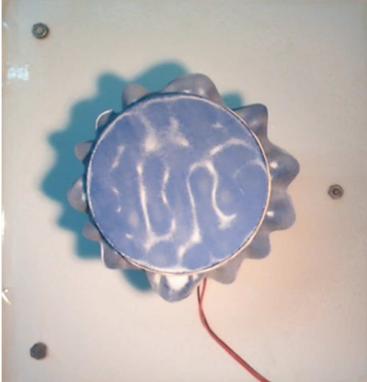
675		751		228	
687		756	<p>volum baix</p>  <p>volum alt</p> 	232 lleugera- ment inestable	

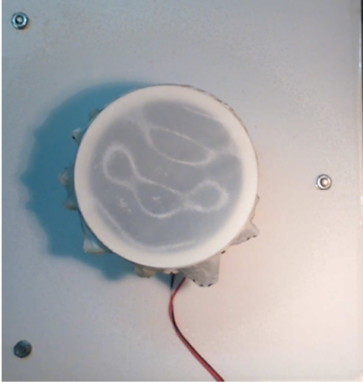
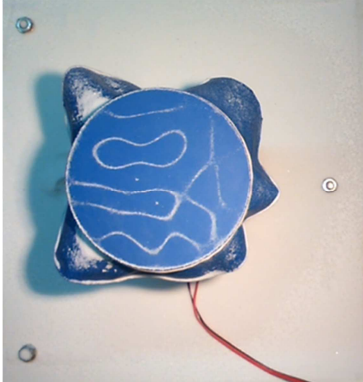
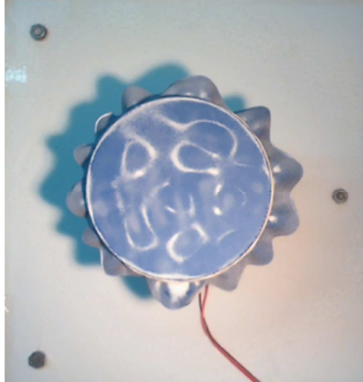
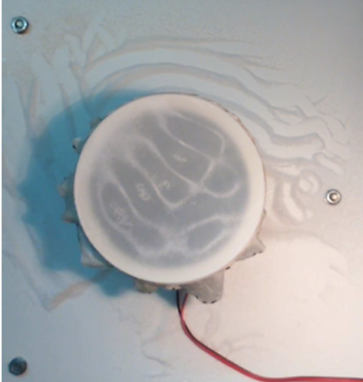
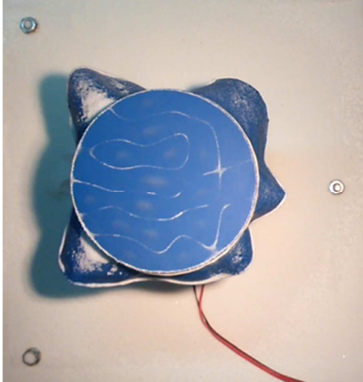
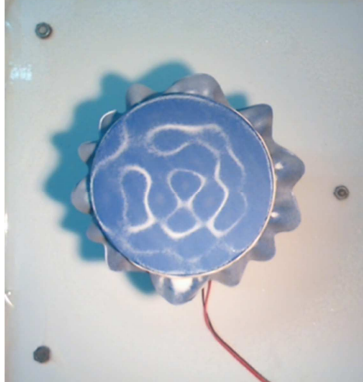

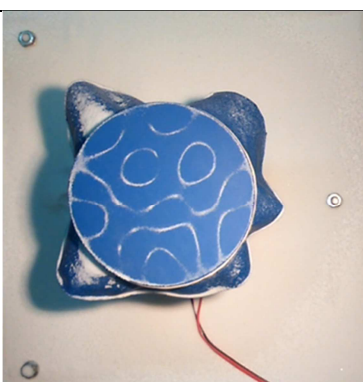
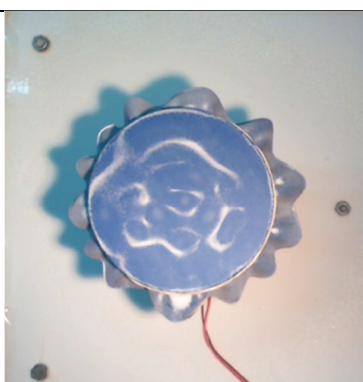
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		781		242	
		787		254	

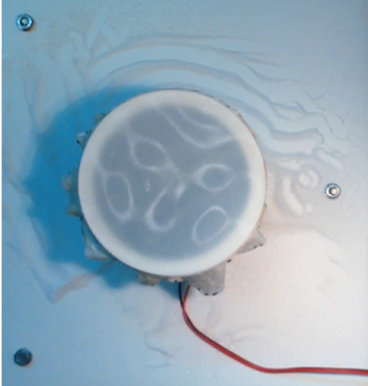
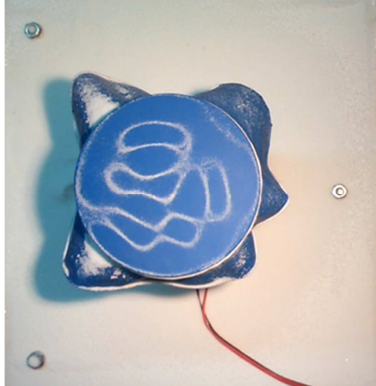
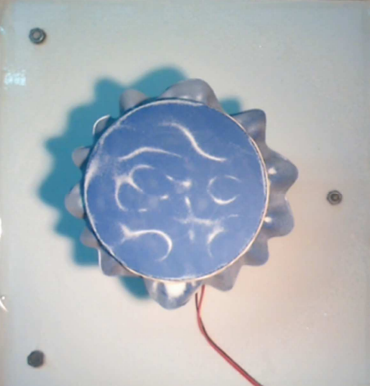
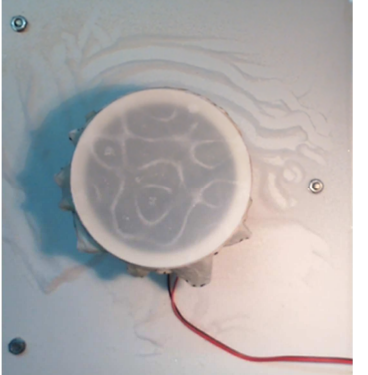
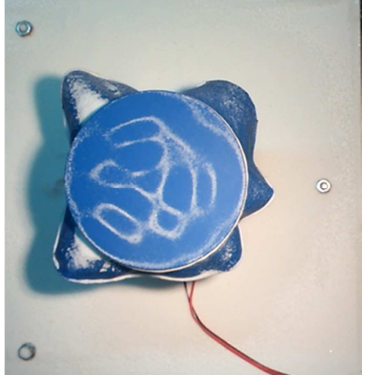
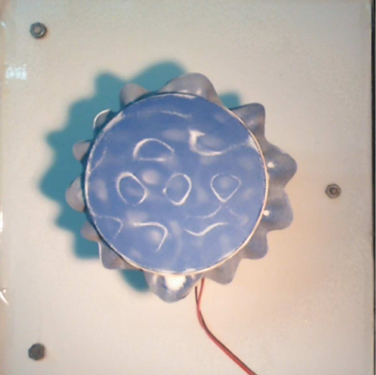
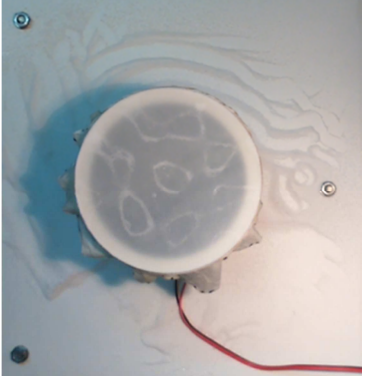
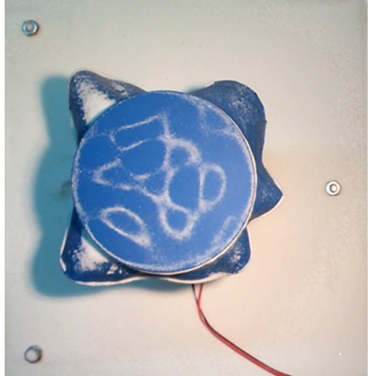
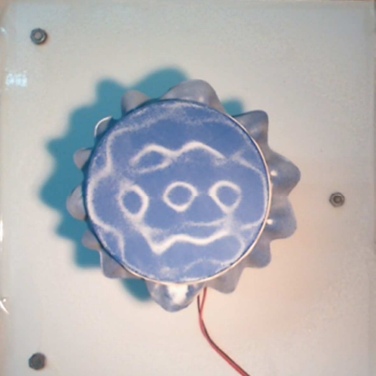
		806		261 inestable	
741		814		268	
758		818-820	poca sal 	272	

			més sal		
784		822			
798		833			

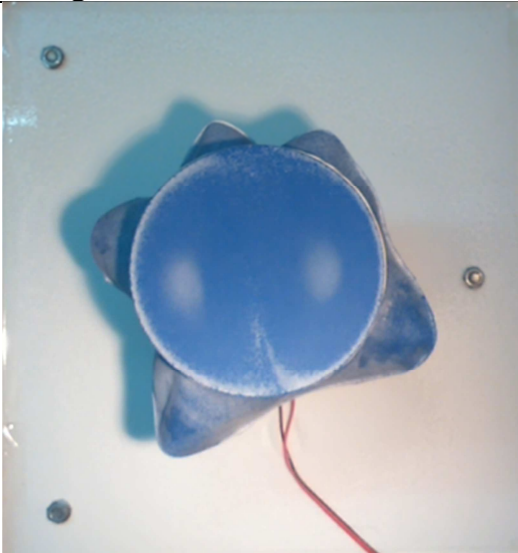
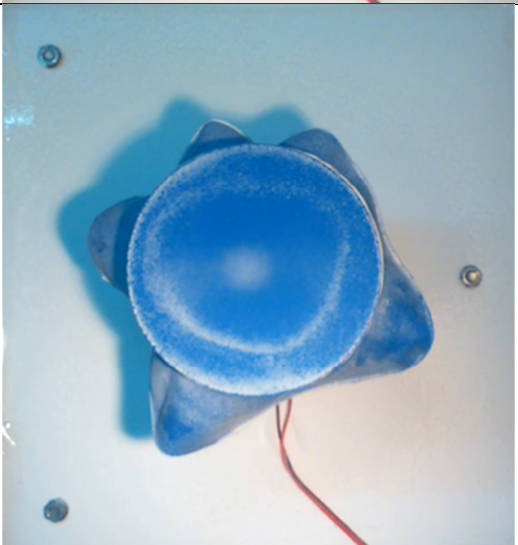
		899		289 estable	
		911		298	
		919		310	

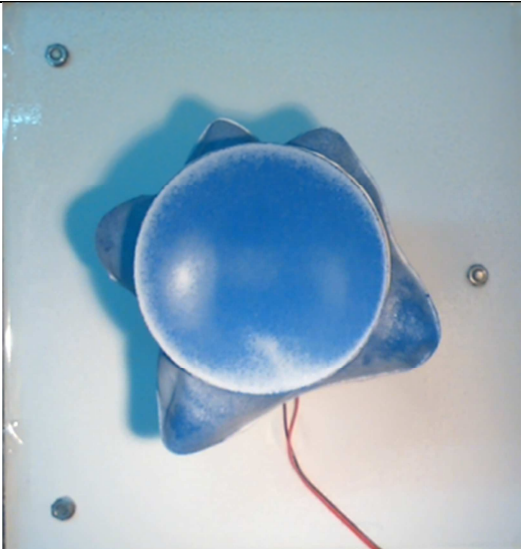
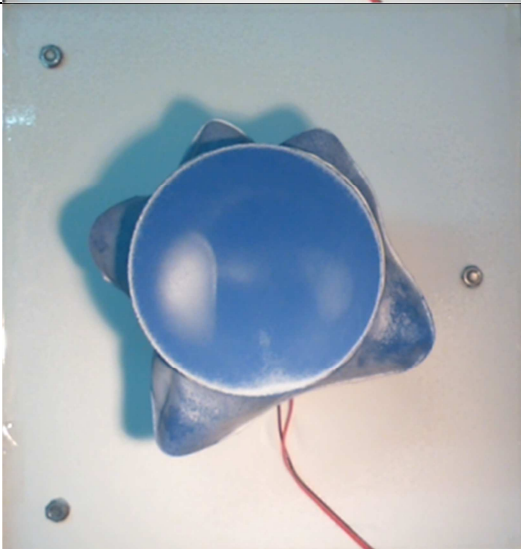
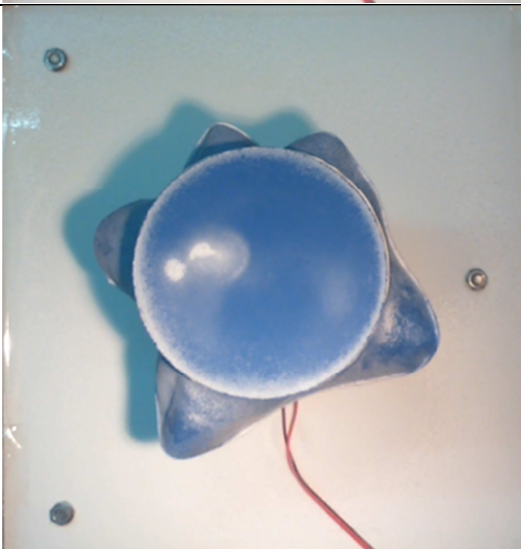
805		923		317	
825		924 transició		327	
834		934 l'home?		330	

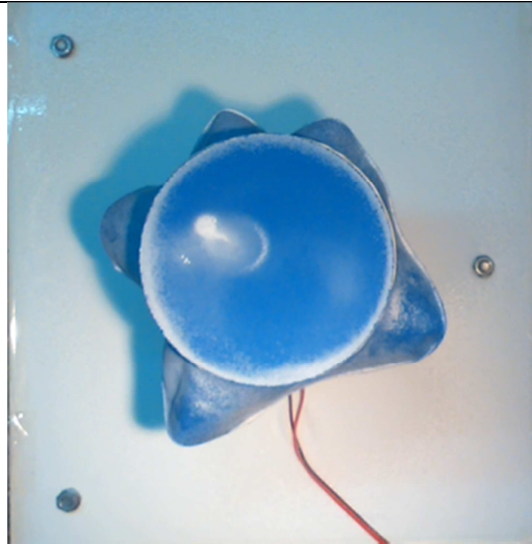
844		947		334	
885		956		341 estable	
902		976		348	

927		992 transició?		352	
936		1008		357	
968		1021		363	

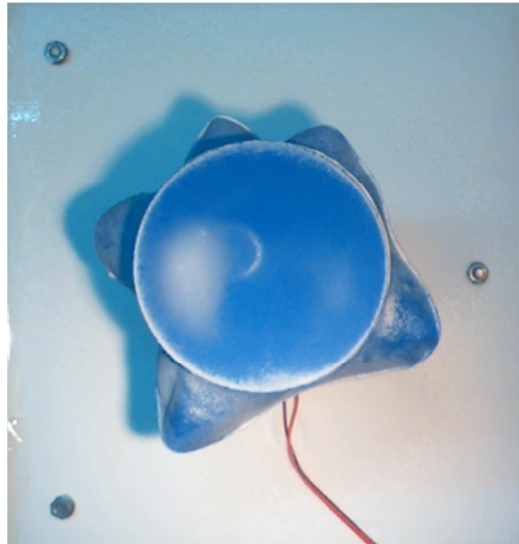
Annex 5: Dues freqüències simultànies (266Hz)

Dues freqüències simultànies (266Hz)		
Freq. 1 (Hz)	Freq. 2 (Hz)	Imatge
266	266	
266	311	

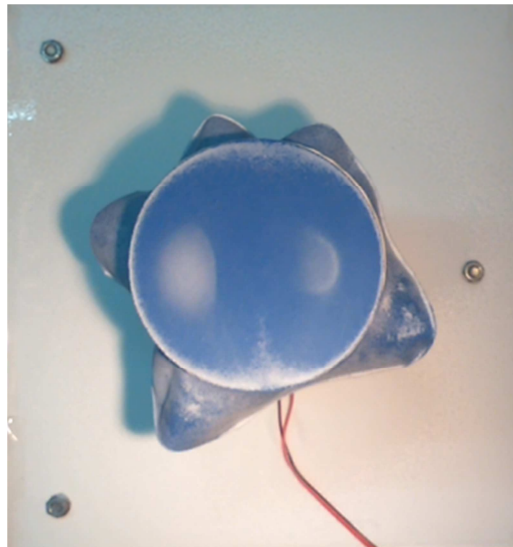
266	400		
266	435		
266	500		
266	532 1r harmònic	volum baix	

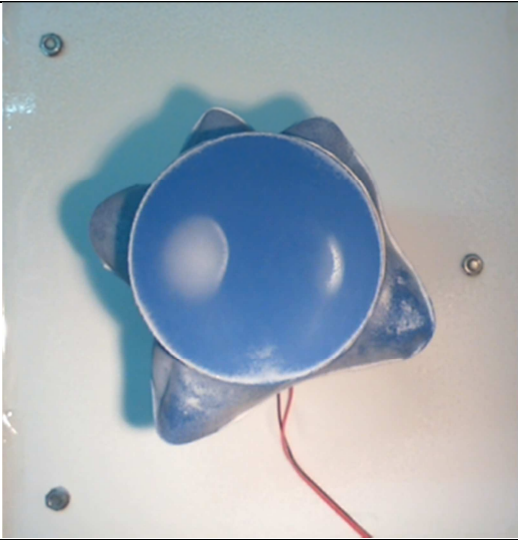

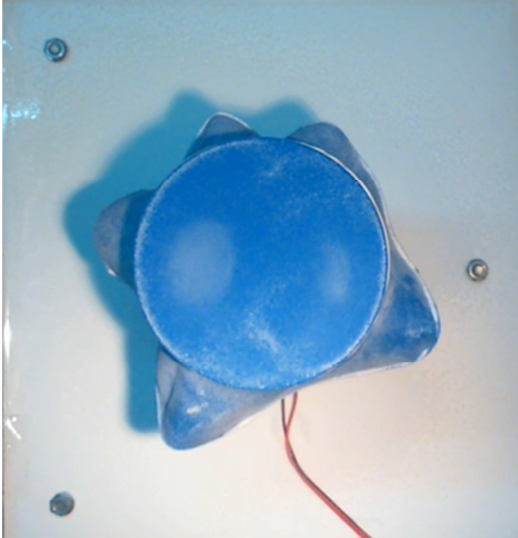


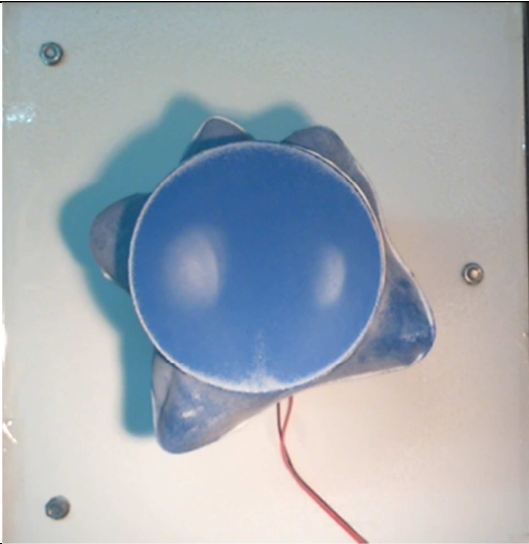
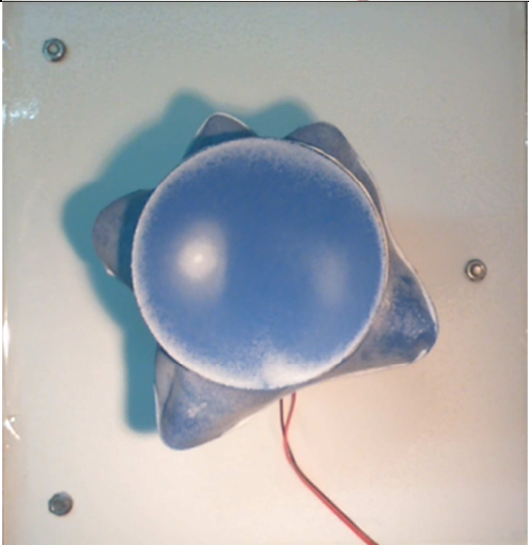
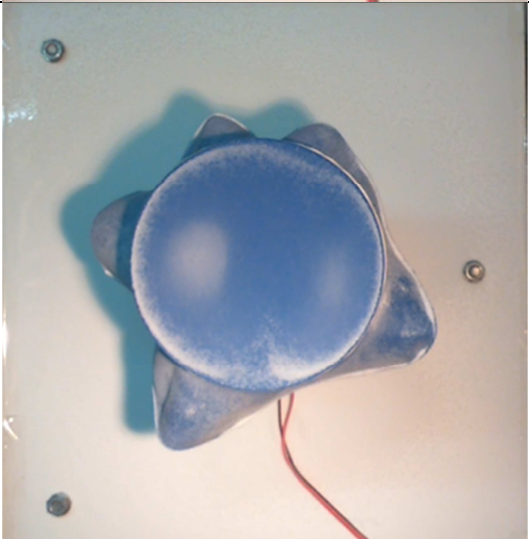
volum alt

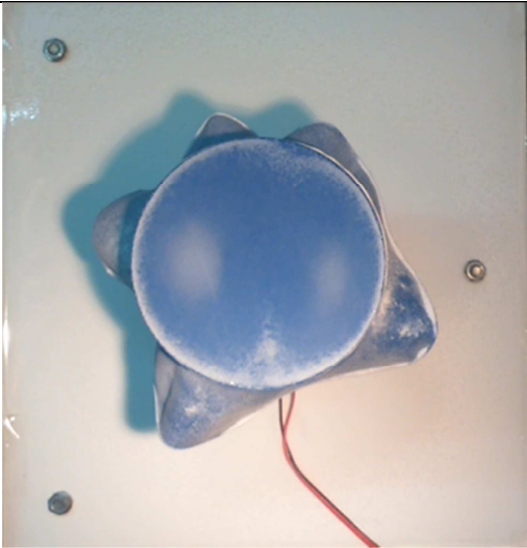
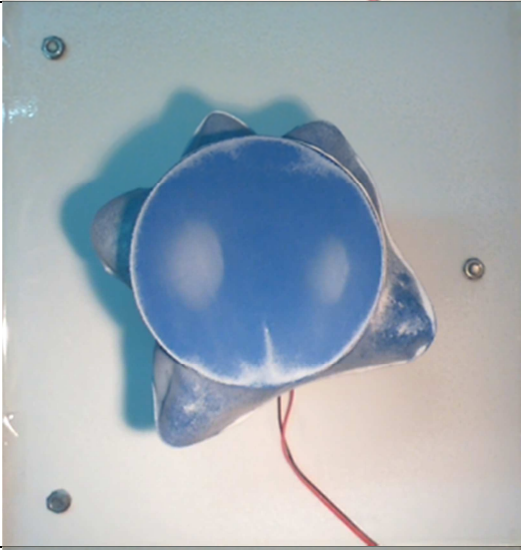
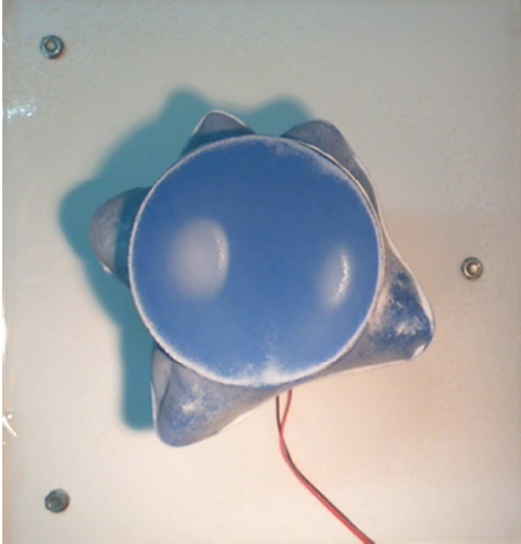


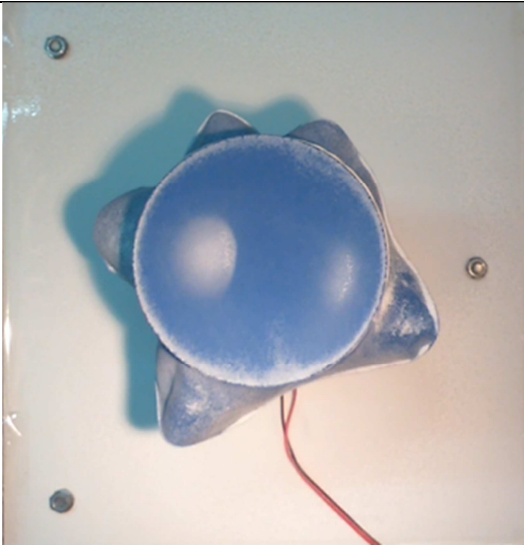
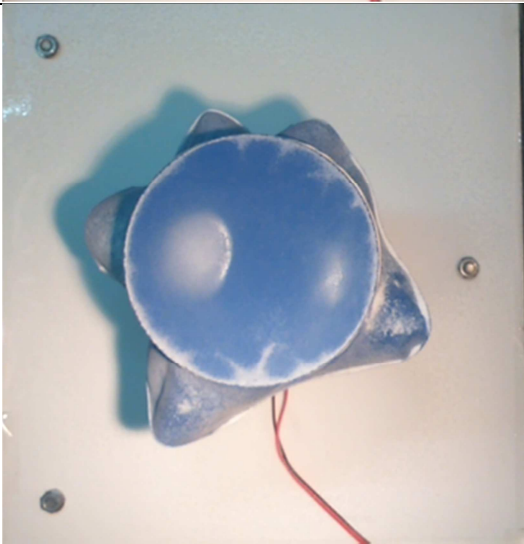
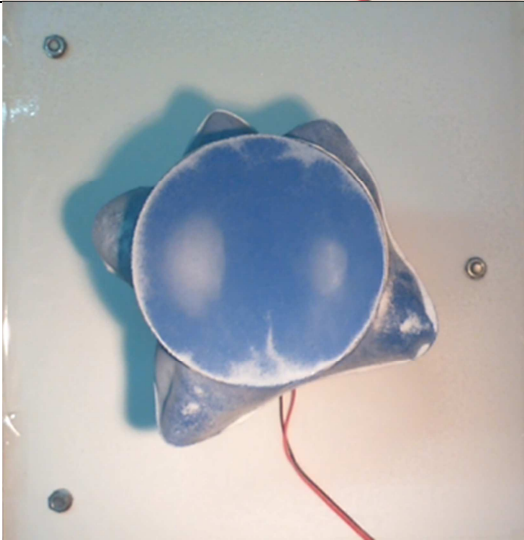
feta de nou:

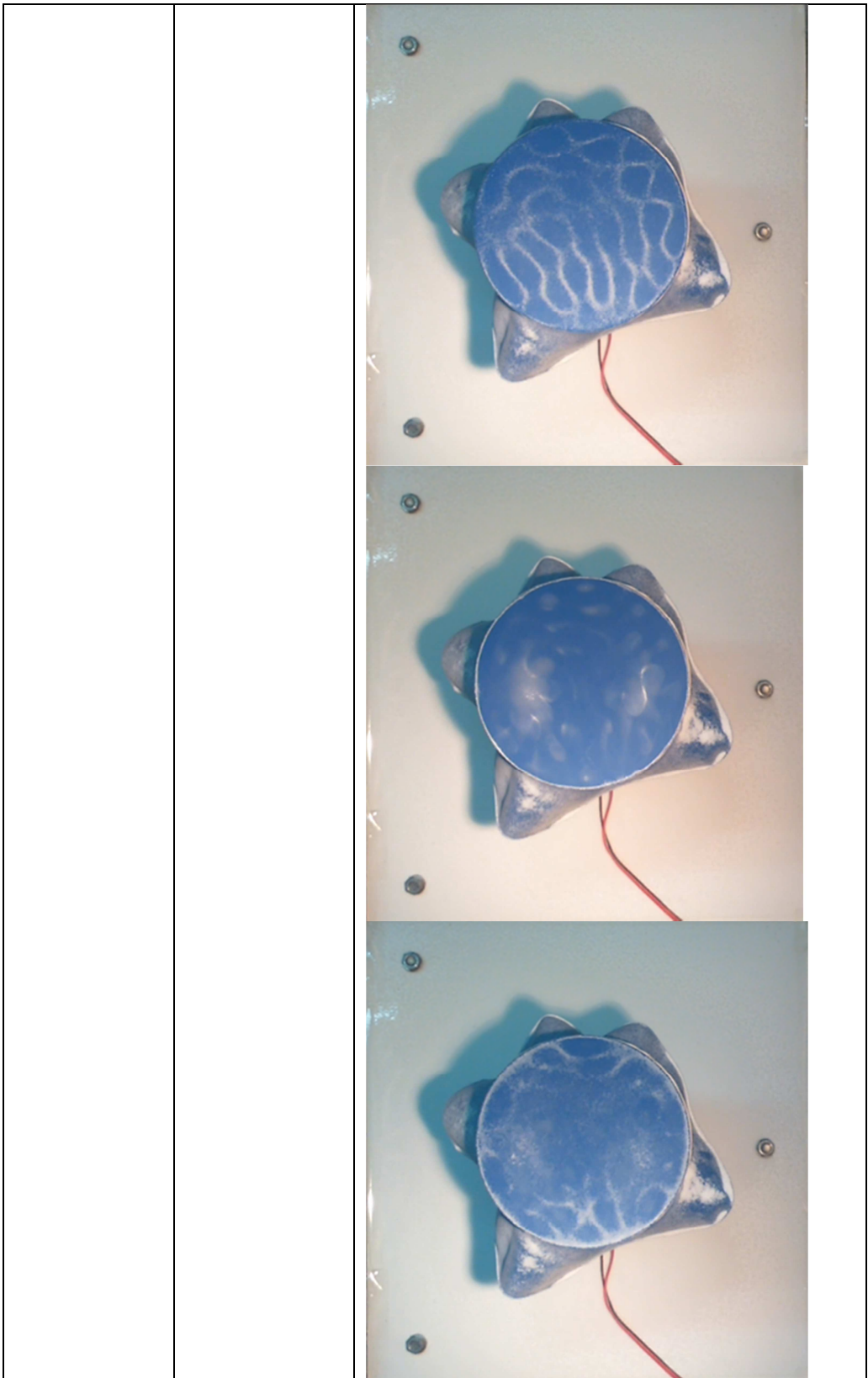


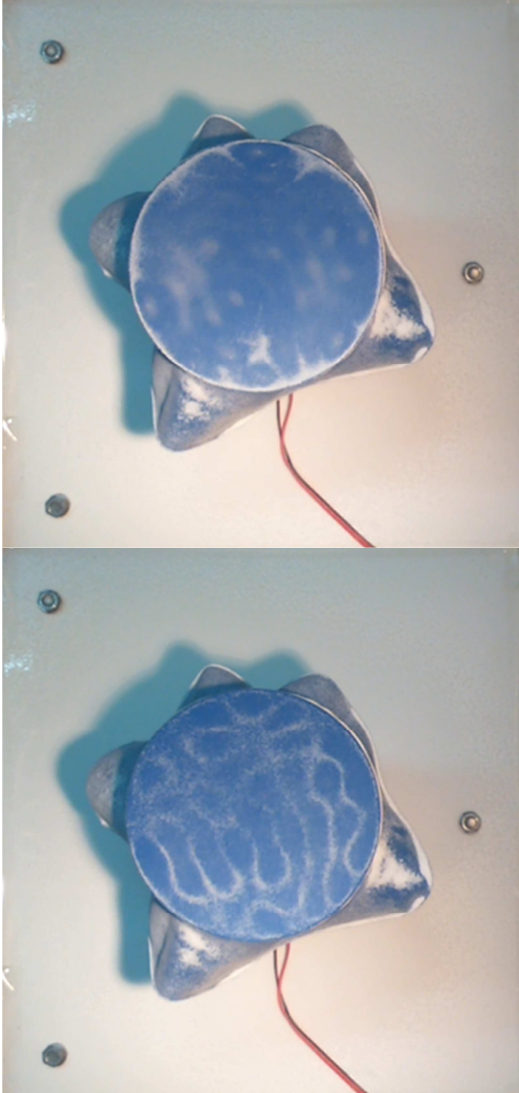
266	610	
266	635	<p>poca sal</p>  <p>feta de nou</p> 

266	650		
266	706		
266	798 3r harmònic		

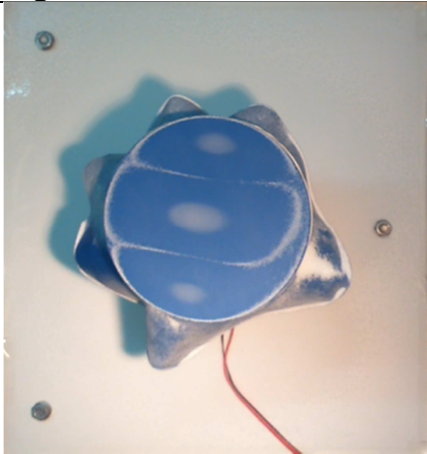
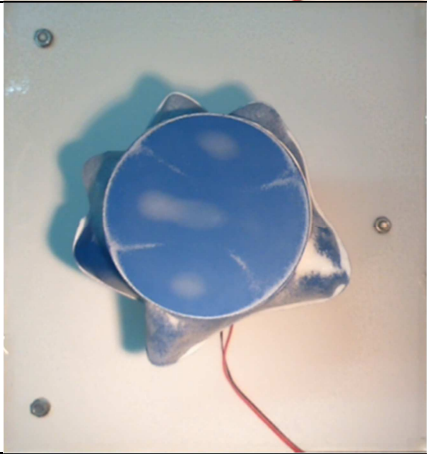
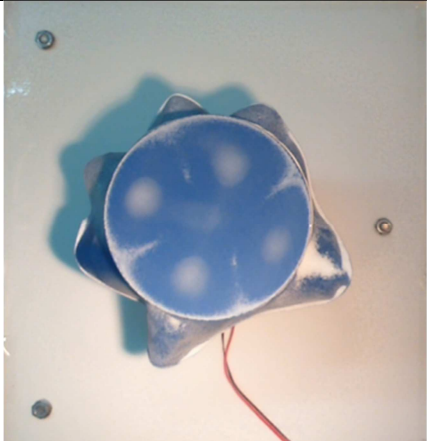
266	880		
266	898		
266	1021		

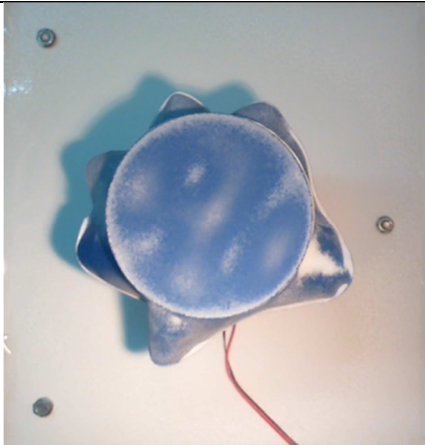
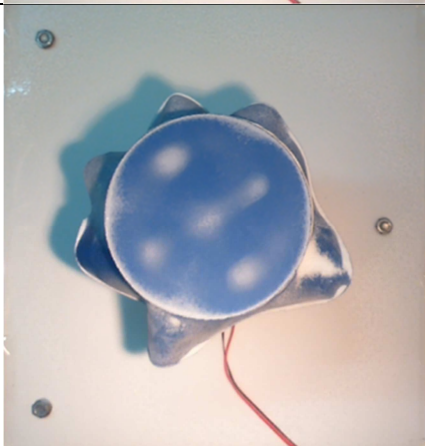
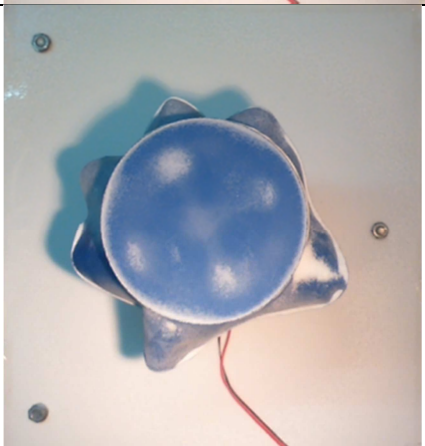

266	1064 4t harmònic		
266	1104		
266	1155		si baixem el volum de la freq. greu, diferents nivells:

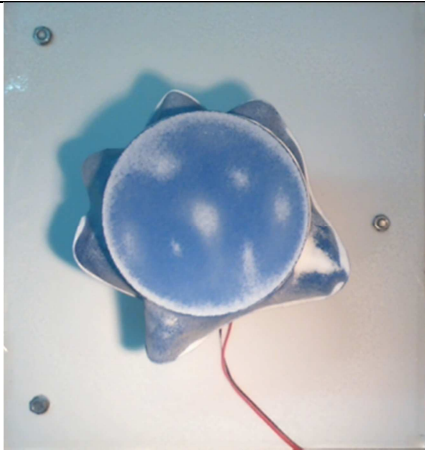
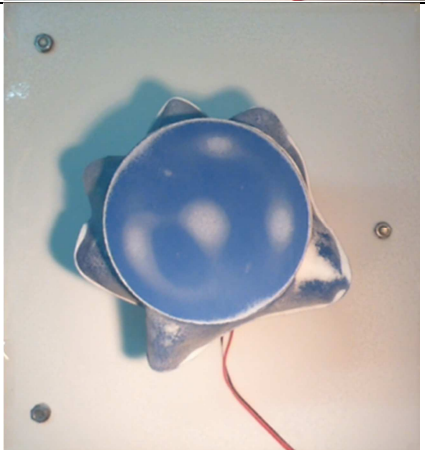
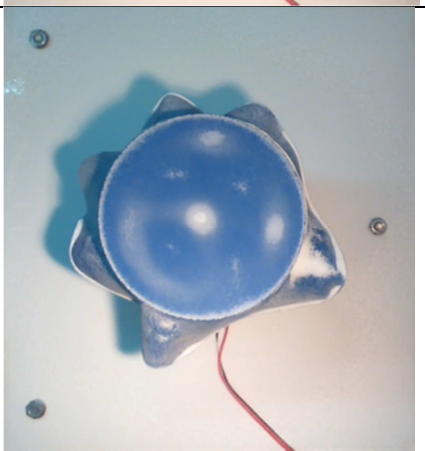
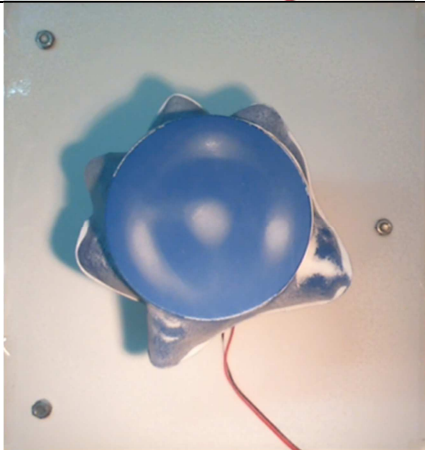


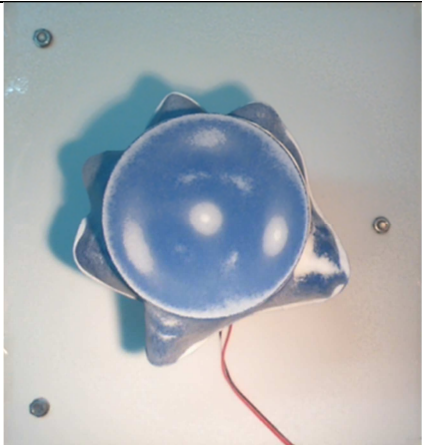
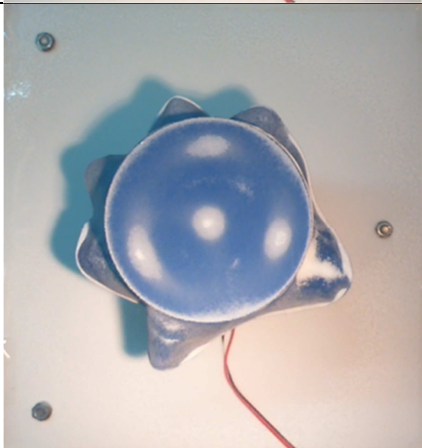
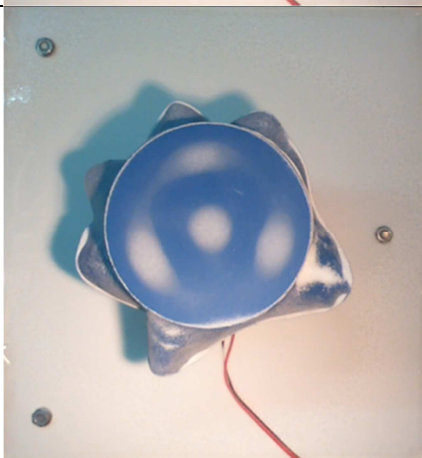
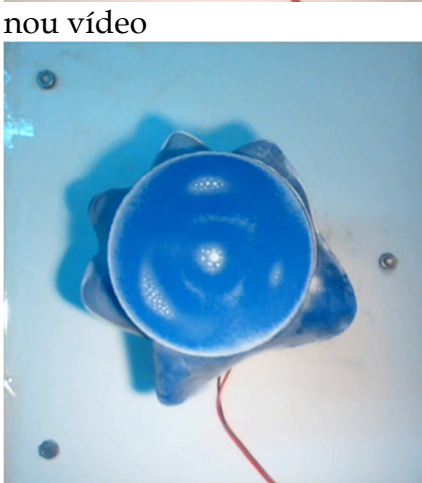
266	1164 volum retocat 4t harmònic	
-----	---------------------------------------------	-------------------------------------------------------------------------------------

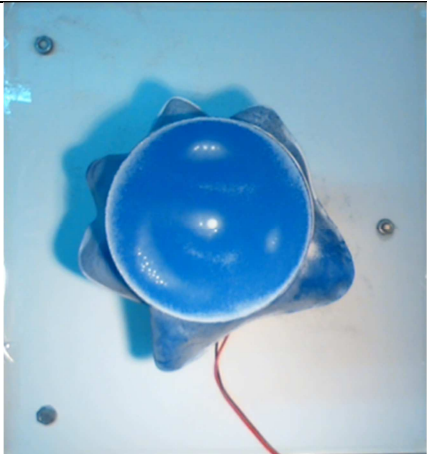
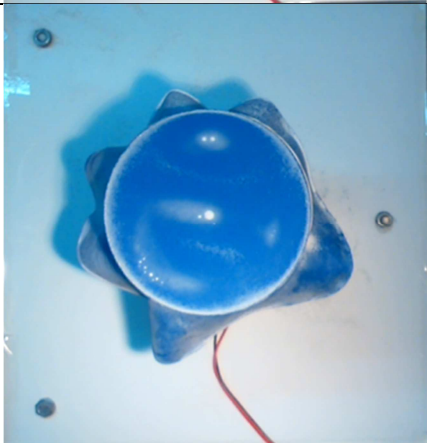
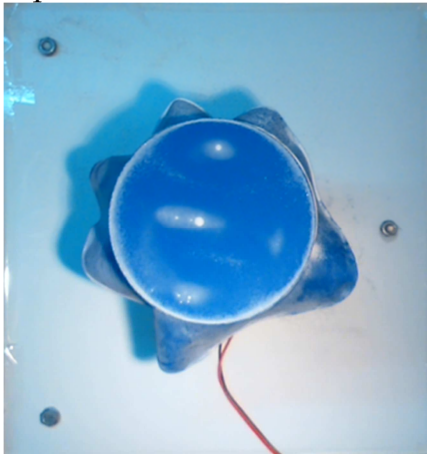
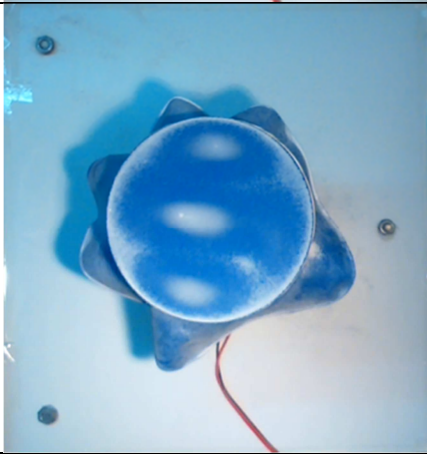
Annex 6: Dues freqüències simultànies (354Hz)

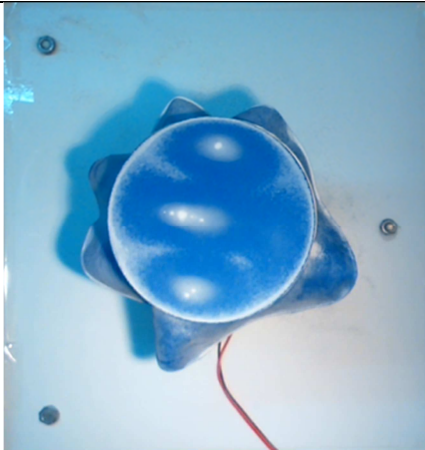
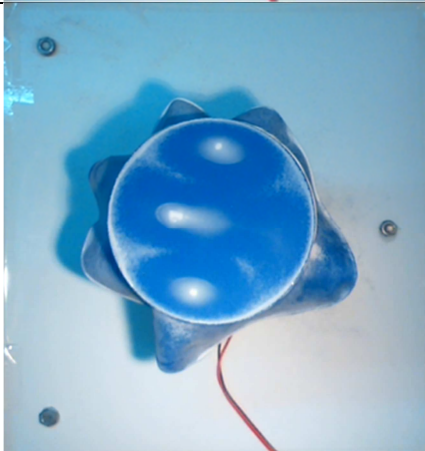
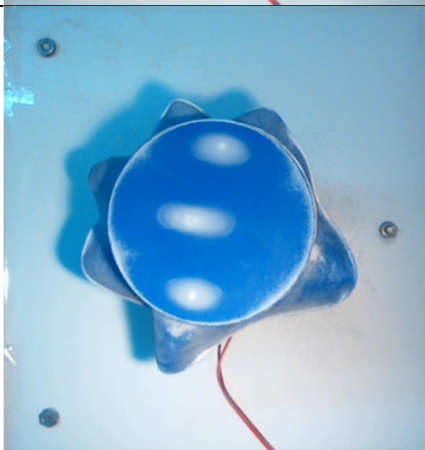
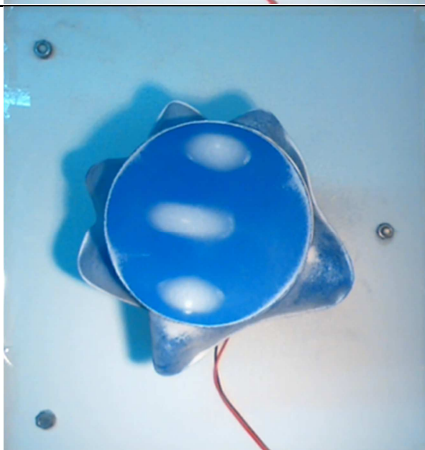
Dues freqüències simultànies (354Hz)		
Freq. 1 (Hz)	Freq. 2 (Hz)	Figura
354	354	
354	360	
354	363	

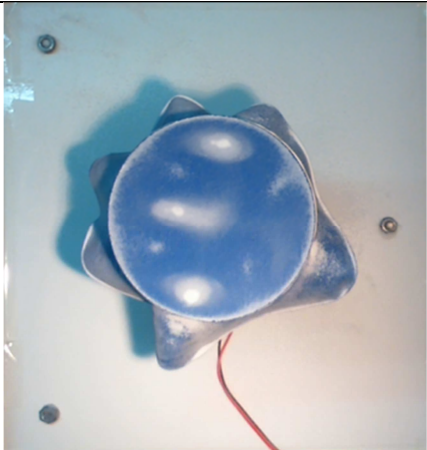
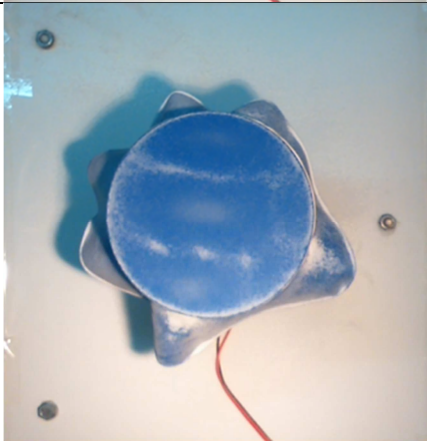
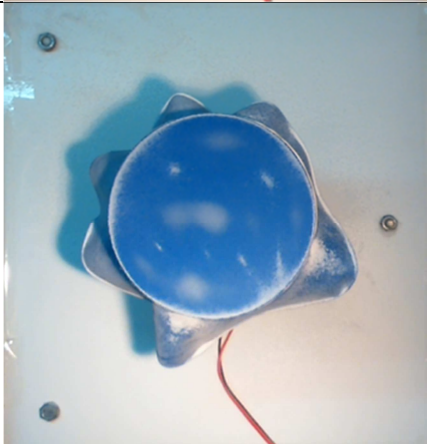
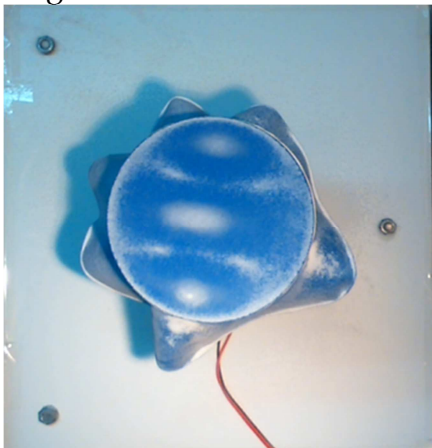
354	368		
354	375		
354	378	 <p>feta de nou</p> 	

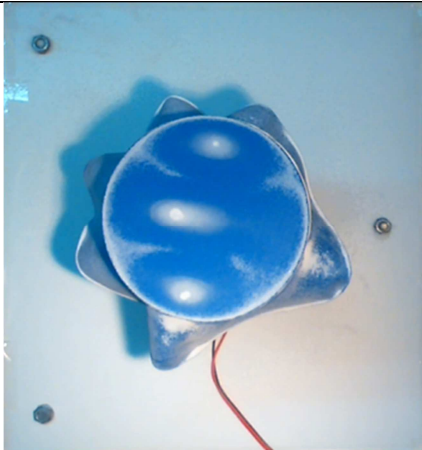
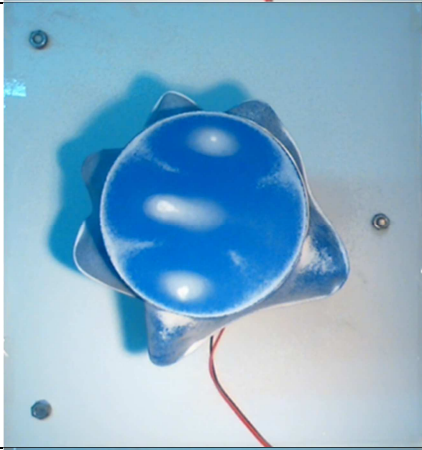
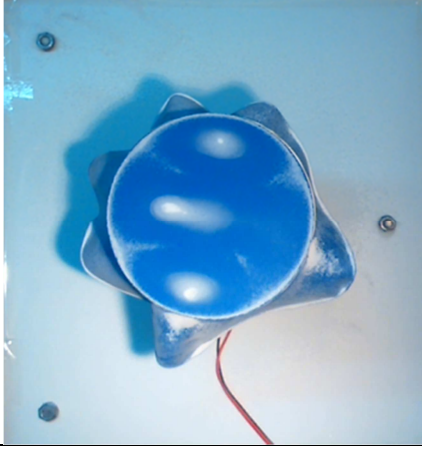
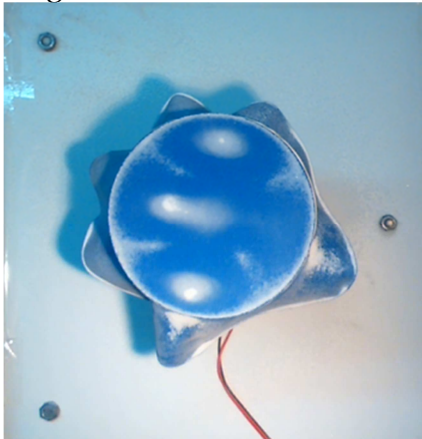
354	382		
354	386		
354	391		
354	396		feta de nou

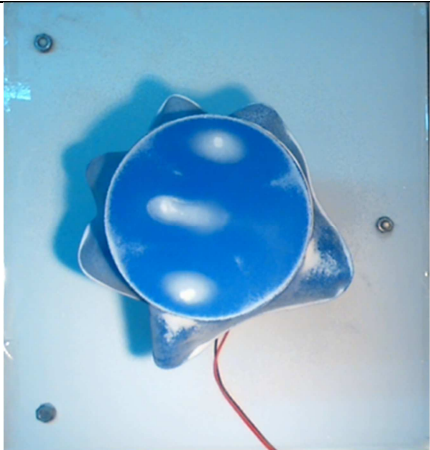
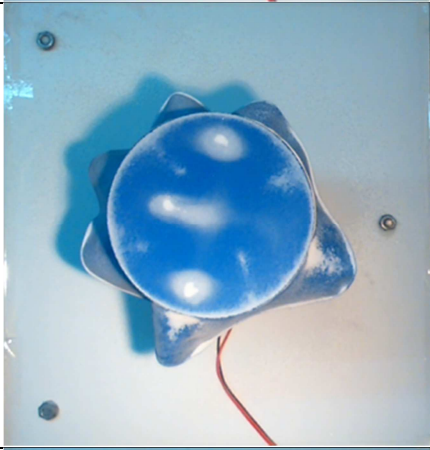
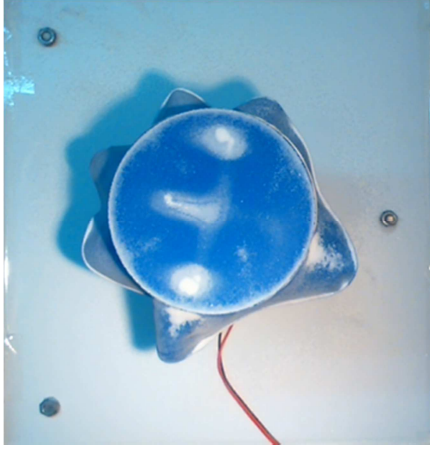
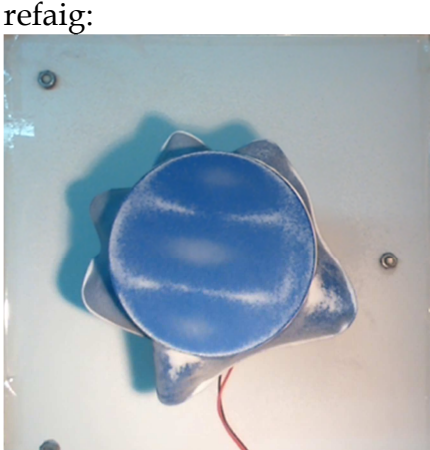
			
354	404		
354	418	 <p>nou vídeo</p> 	

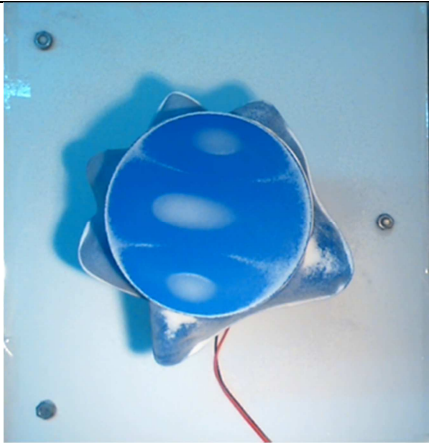
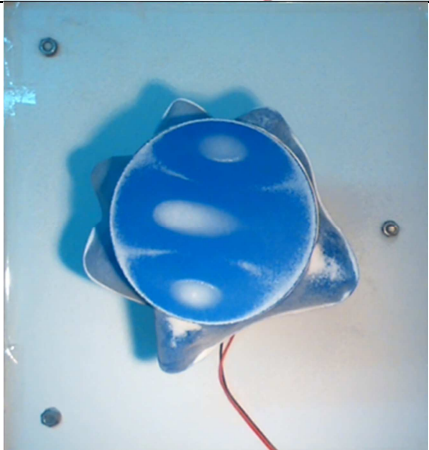
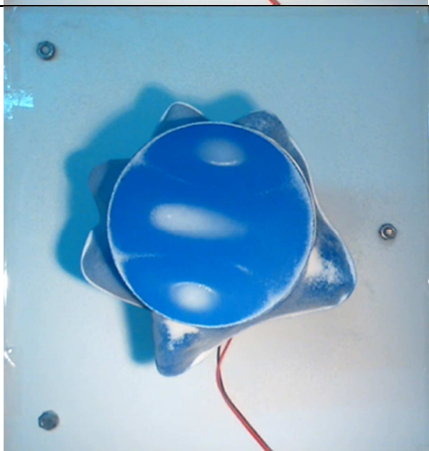
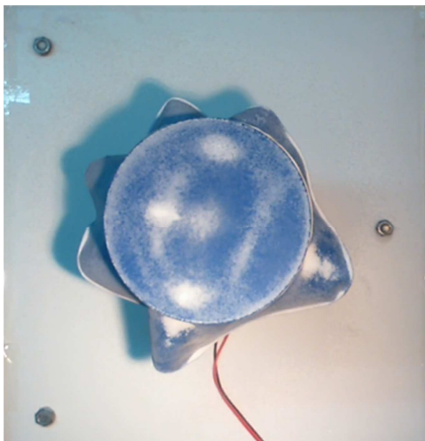
354	432	
354	456	 <p>esperant un rato:</p> 
354	464	

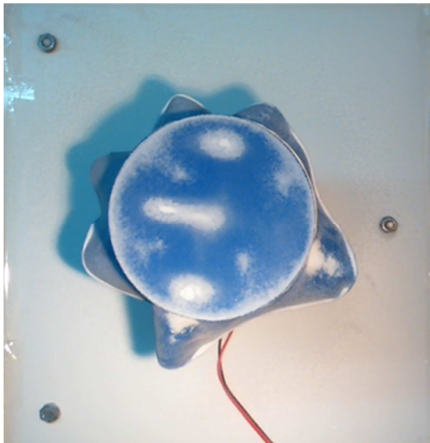
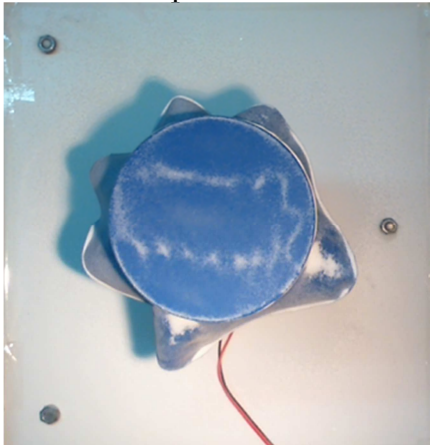
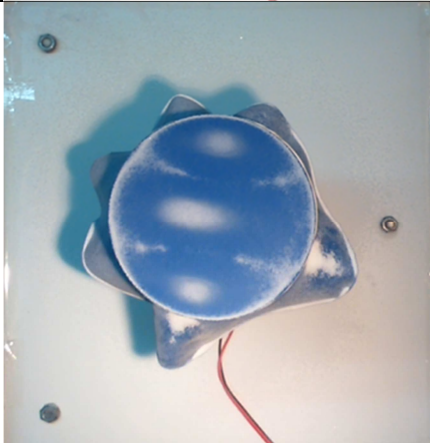
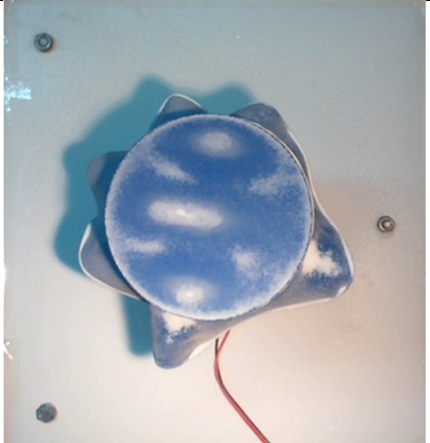
354	496		
354	531 (quinta)		
354	554		
354	592		

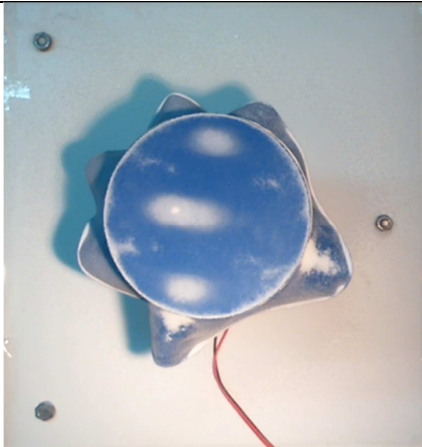
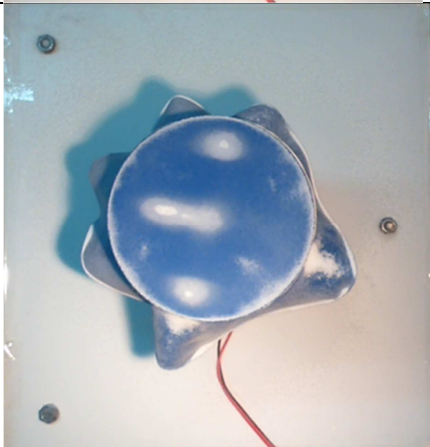
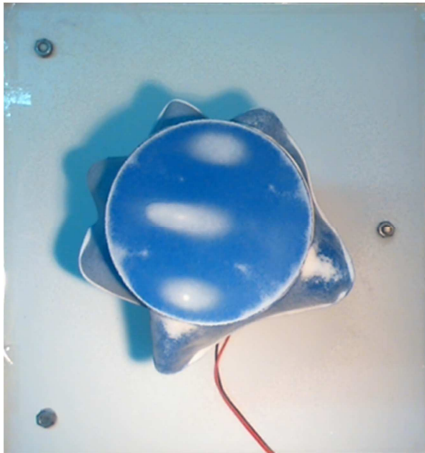
354	622		
354	631		
354	643		
354	656	afegeixo sal: 	

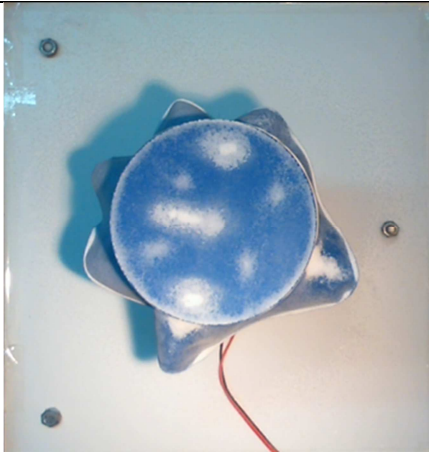
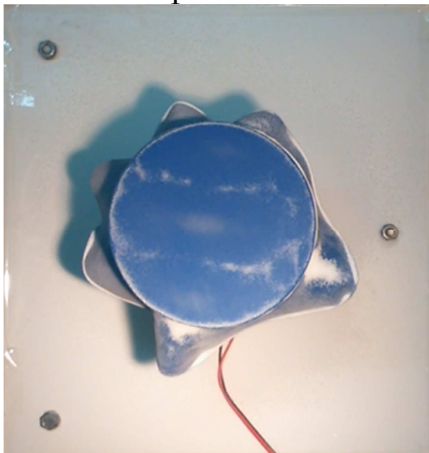
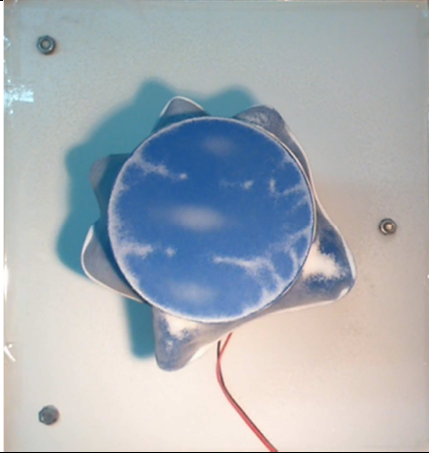
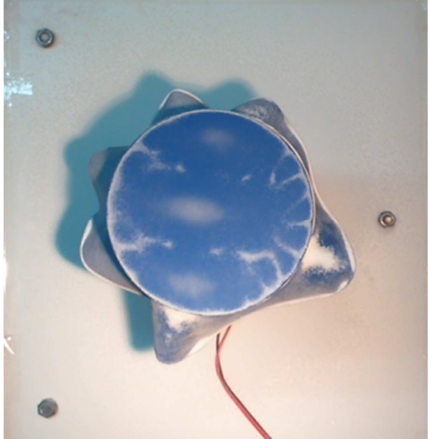
354	708 1r harmònic		
354	753		
354	780		
354	817	afegeixo sal 	

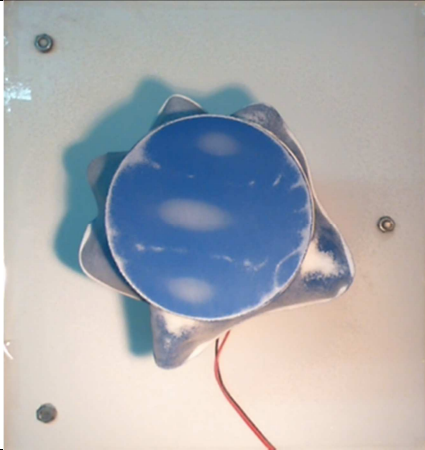
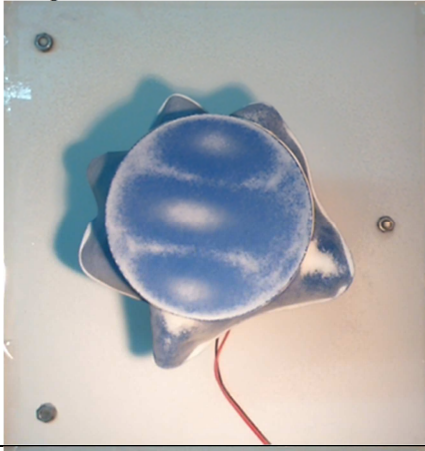
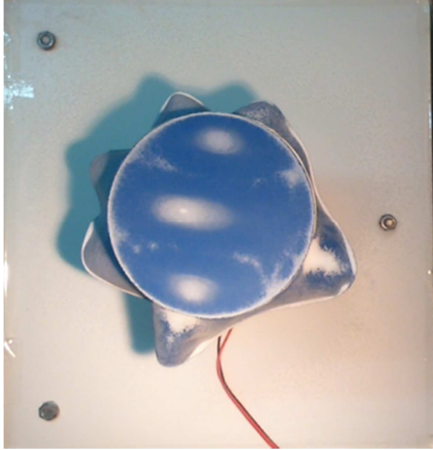
354	882	
354	895	
354	910	 refaig: 

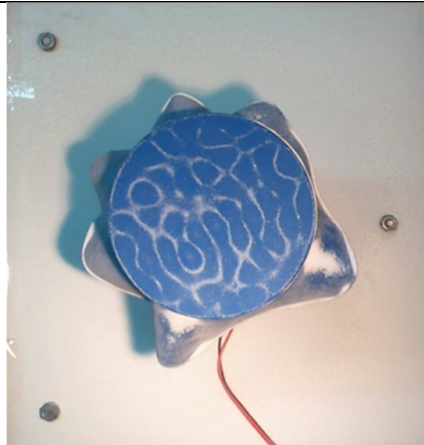
354	952	
354	1000	
354	1062 2n harmònic	
354	1170	molta sal volum baix 

		<p>volum alt</p>  <p>feta de nou poca sal volum baix:</p> 
354	1185	
354	1215	

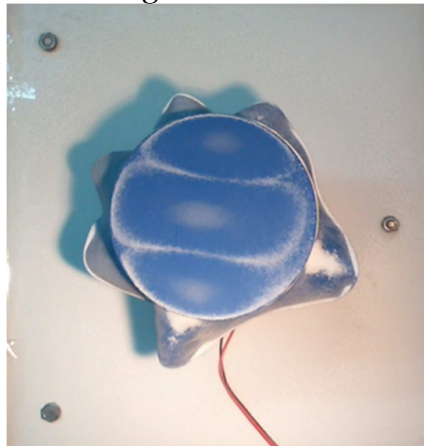
354	1250	
354	1270	
354	1290	<p>volum alt</p>  <p>feta de nou molta sal</p>

		 <p>feta de nou poca sal</p> 
354	1300	
354	1313	

354	1358	
354	1366	afegeixo sal 
354	1416 4t harmònic	 només agut:



només la greu:



les dues a la vegada:

