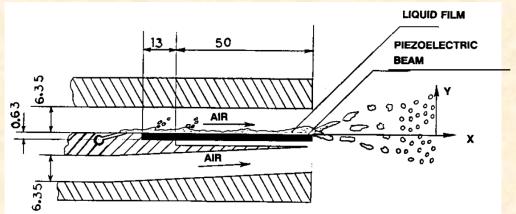


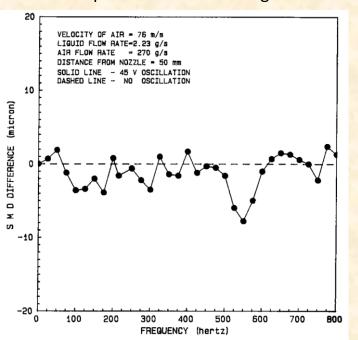
Liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam and flows downward in this page. Gravity direction is downward. Camera to subject distance is 81.3 cm. Flash light to subject distance is 30.5 cm.

Zoom lens: Vivitar Series 1, Model 28530352, Macro Focusing Zoom Lens, 70-210 mm 1:2.8 – 4.0 f/No.

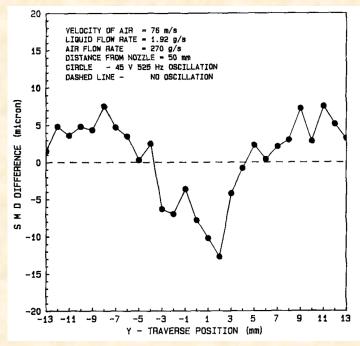


Cantilever
Rectangular-Shaped
Piezoelectric Beam

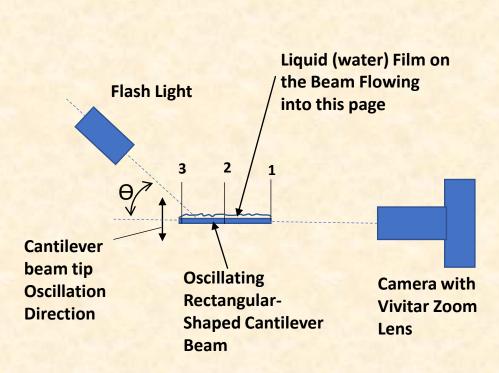
Schematic diagram of a two-dimensional model of the prefilming atomizer with piezoelectric oscillating beam. All dimensions are in millimeter.



Difference between SMD values for with and without beam oscillations as a function of beam oscillation frequency.

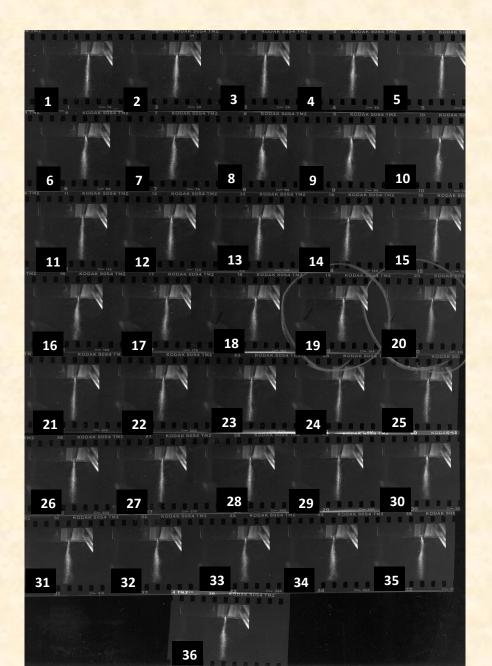


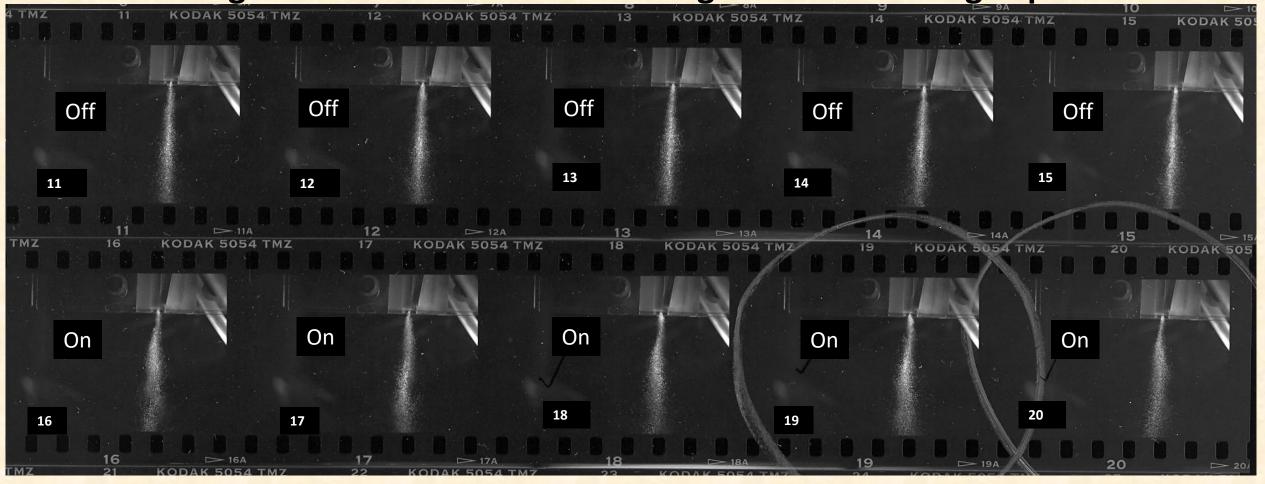
Difference between SMD values for with and without beam oscillations as a function of Y-traverse position at a distance of 50 mm from the nozzle.



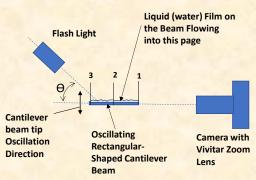
In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam (its size is exaggerated) and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 99.06 cm. The Θ angle is about 45degrees. Flash light to subject distance is 20.32 cm.

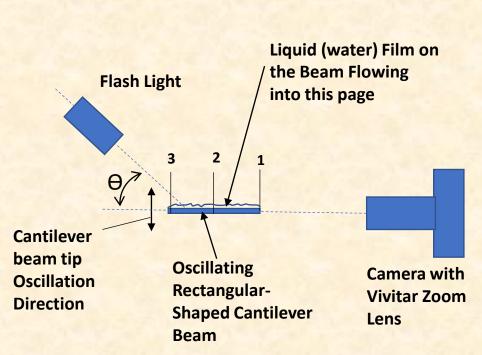
Oscillation	Oscillation and Camera Settings				
for t	he Pictures T	aken			
	_ ASA 3200				
	_ F/# 2.8				
Frame #	Oscillation	Focused			
		Location			
1	Off	1			
2	Off	1			
3	Off	1			
4	Off	1			
5	Off	1			
6	On (537 Hz)	1			
7	On (537 Hz)	1			
8	On (537 Hz)	1			
9	On (537 Hz)	1			
10	On (537 Hz)	1			
11	Off	2			
12	Off	2			
13		2			
14		3			
15	Off	3			
16	, ,	3			
17	, ,	3			
18	On (537 Hz)	2 2			
19	On (537 Hz)	2			
20	,	2			
21	On (400 Hz)	2			
22	On (400 Hz)	2			
23	On (400 Hz)	2 2 2 2 2 2			
24	On (400 Hz)	2			
25	On (400 Hz)	2			
26	Off	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			
27	Off	2			
28	Off	2			
29	Off	2			
	On (537 Hz)	2			
31	On (537 Hz)	2			
32	On (537 Hz)	2			
33	On (537 Hz)	1			
34	On (537 Hz)	1			
35	On (537 Hz)				
36	On (537 Hz)	1+A1:C40			





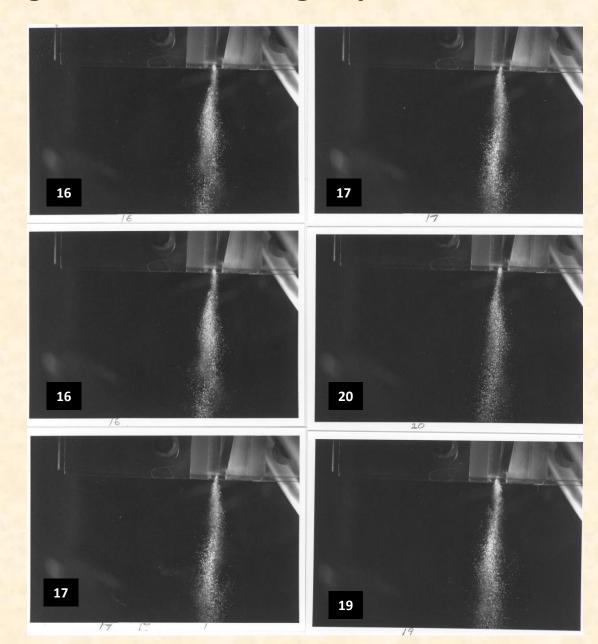
In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam (its size is exaggerated) and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 99.06 cm. The Θ angle is about 45degrees. Flash light to subject distance is 20.32 cm.

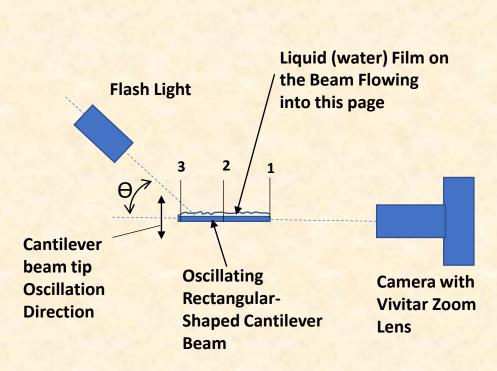




In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam (its size is exaggerated) and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 99.06 cm. The Θ angle is about 45degrees. Flash light to subject distance is 20.32 cm.

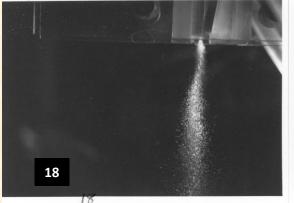
Oscillatio	Oscillation and Camera Settings				
for t	for the Pictures Taken				
	_ ASA 3200				
	_ F/# 2.8				
Frame #	Oscillation	Focused			
		Location			
1	Off	1			
2	Off	1			
3	Off	1			
4	Off	1			
5	Off	1			
6	On (537 Hz)	1			
7	On (537 Hz)	1			
8	On (537 Hz)	1			
9	On (537 Hz)	1			
10	On (537 Hz)	1			
11	Off	2			
12	Off	2			
13	Off	2			
14	Off	3			
15	Off	3			
16	On (537 Hz)	3			
17	On (537 Hz)	3			
	On (537 Hz)	2			
19	On (537 Hz)	2			
20	On (537 Hz)	2			
21	On (400 Hz)	2			
22	On (400 Hz)	2			
23	On (400 Hz)	2			
24	On (400 Hz)	2			
25	On (400 Hz)	2			
26	Off	2			
27	Off	2			
28	Off	2			
29	Off				
30	On (537 Hz)	2 2			
31	On (537 Hz)				
32	On (537 Hz)	2 2			
33	- (/	2			
34	On (537 Hz)	1			
35	, ,	1			
36	On (537 Hz)	1+A1:C40			

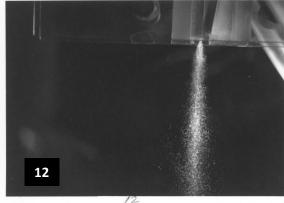


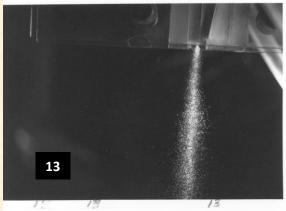


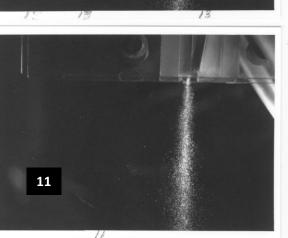
In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam (its size is exaggerated) and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 99.06 cm. The Θ angle is about 45degrees. Flash light to subject distance is 20.32 cm.

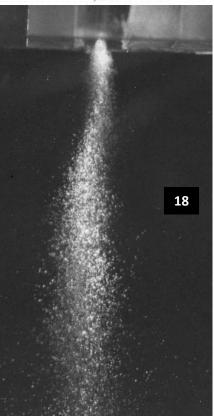
Oscillatio	n and Camer	a Settings
for t	he Pictures T	aken
	_ ASA 3200	
	_ F/# 2.8	
Frame #	Oscillation	Focused
		Location
1	Off	1
2	Off	1
3	Off	1
4	Off	1
5	Off	1
6	On (537 Hz)	1
7	On (537 Hz)	1
8	On (537 Hz)	1
9	On (537 Hz)	1
10	On (537 Hz)	1
11	Off	2
12	Off	2
13	Off	2
14	Off	3
15	Off	3
16	On (537 Hz)	3
17	On (537 Hz)	3
18	On (537 Hz)	2
19	On (537 Hz)	2
20		2
21	On (400 Hz)	2
22	On (400 Hz)	2
23	On (400 Hz)	2
24	On (400 Hz)	2
25	On (400 Hz)	2
26	Off	2
27	Off	2
28	Off	2
29	Off	2
30	On (537 Hz)	2
31	On (537 Hz)	2
32	On (537 Hz)	2
33	On (537 Hz)	2
34	On (537 Hz)	1
35	On (537 Hz)	1
36	On (537 Hz)	1+A1:C40

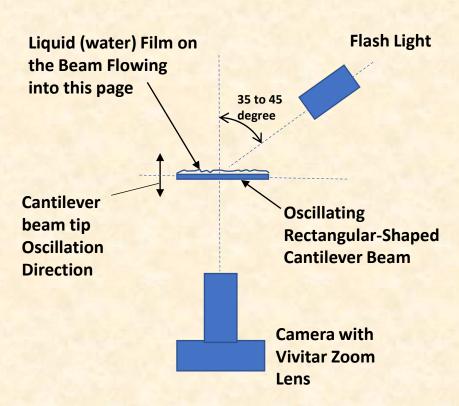












In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 68.6 cm. Flash light to subject distance is 30.5 cm.

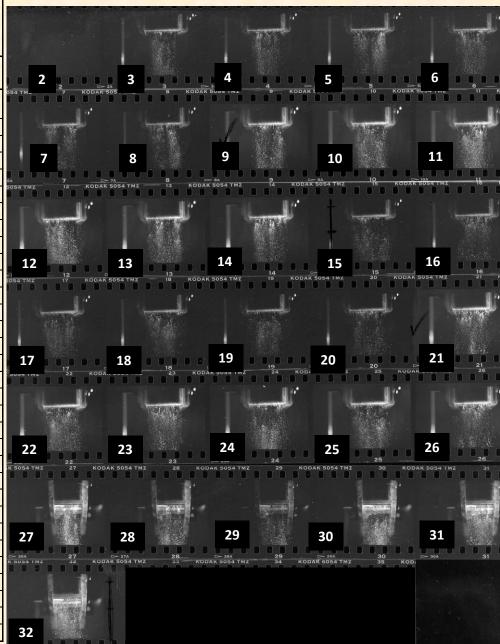
Zoom lens: Vivitar Series 1, Model 28530352, Macro Focusing Zoom Lens, 70-210 mm 1:2.8 – 4.0 f/No.

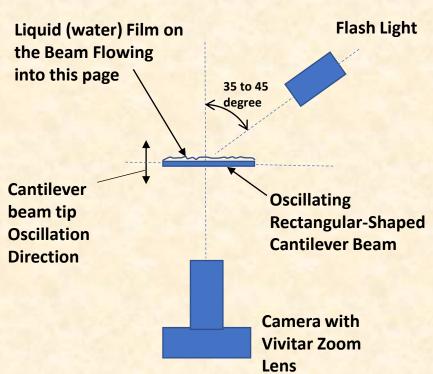
_	Challes di Dia	
В.	Chehroudi, Phl)

Oscillation and Camera Settings for the Pictures					
	Taken				
	_ A	SA 3200			
	_Camera S	Shutter is C)pen		
Frame #	Frame # Oscillation F/# Camera View				
			Direction		
1		8	Perpendicular to		
			Liquid Film		
2		1			
3	Off	1	"		
4	Off	1	"		
5	Off	1	"		
6		1	"		
7	Off	1	II .		
8	Off	1	"		
9	Off	5.6	"		
10	Off	1	п		
11	Off	2	"		
12	Off	2	"		
13	Off	2	п		
	Off	8	"		
15	On (537 Hz)	8	"		
16	On (537 Hz)	8	II .		
17	On (537 Hz)	8	II .		
18	On (537 Hz)	8	· ·		
19	On (537 Hz)	8	п		
20	On (537 Hz)	8	п		
21	On (537 Hz)	5.6	II .		
22	On (537 Hz)	5.6	п		
23	On (537 Hz)	5.6	· ·		
24	On (537 Hz)	5.6	II .		
25	On (537 Hz)	5.6	II .		
26	On (537 Hz)	5.6	"		
27	Off	2.8	Looking Upward		
28	Off	4	"		
29	Off	5.6	"		
30	On (537 Hz)	2.8	"		
31	On (537 Hz)	4	"		

32 On (537 Hz)

5.8

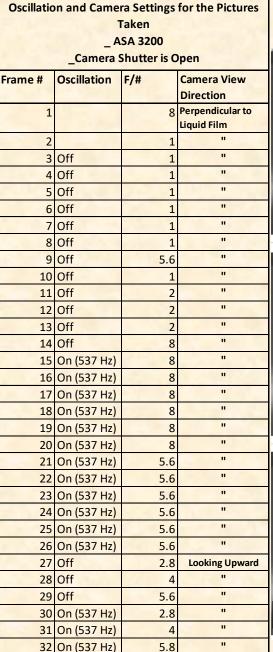


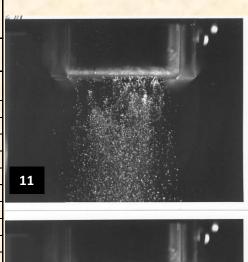


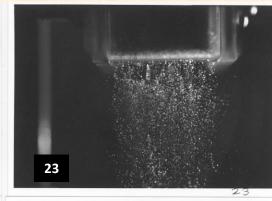
In this schematic of cantilever rectang flows perpendicul also into the page cm. Flash light to s

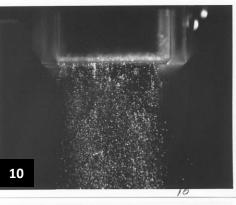
Zoom lens: Vivitar Serie Zoom Lens, 70-210 mm

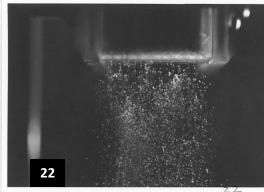
		11	Off
		12	Off
		13	Off
	Camera with	14	Off
		15	On (537
	Vivitar Zoom	16	On (537
	Lens	17	On (537
		18	On (537
diagram the l	iquid Sheet is on the		On (537
			On (537
guiar-snaped p	piezoelectric beam and		On (537
lar into this pa	age. Gravity direction is		On (537
. Camera to si	ubject distance is 68.6		On (537
			On (537
subject distan	ice is 30.5 cm.		On (537
			On (537
			Off
4 4 4 4 4 6 6 7 6 7			Off
	0352, Macro Focusing		Off
n 1:2.8 – 4.0 f/No.			On (537
			On (537
		32	On (537

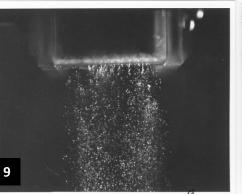


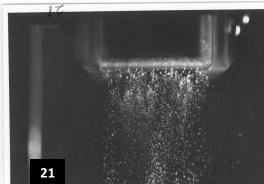


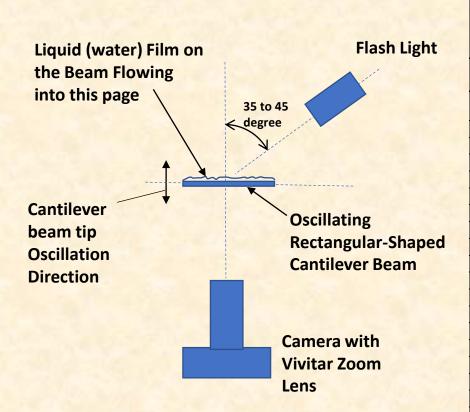










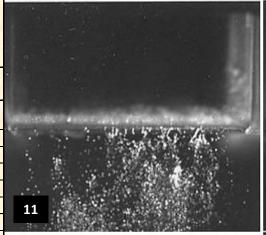


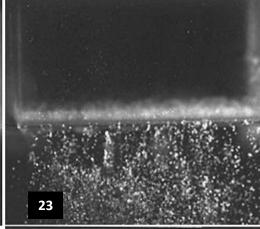
In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam and flows perpendicular into this page. Gravity direction is also into the page. Camera to subject distance is 68.6 cm. Flash light to subject distance is 30.5 cm.

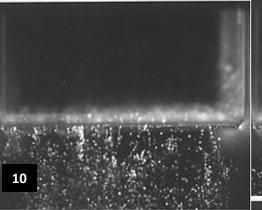
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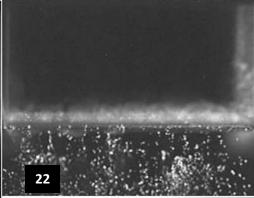
Oscillation and Camera Settings for the Pictures
Taken
_ ASA 3200
_Camera Shutter is Open

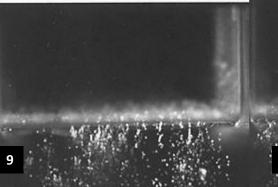
	_camera .	onatter is e	pen
Frame #	Oscillation	F/#	Camera View
			Direction
1	-	8	Perpendicular to Liquid Film
2		1	"
3	Off	1	"
4	Off	1	"
5	Off	1	"
6	Off	1	11
7	Off	1	
8	Off	1	"
9	Off	5.6	II .
10	Off	1	II .
11	Off	2	"
12	Off	2	"
13	Off	2	11
14	Off	8	II .
15	On (537 Hz)	8	- 11
16	On (537 Hz)	8	11
17	On (537 Hz)	8	11
	On (537 Hz)	8	· ·
19	On (537 Hz)	8	II .
20	On (537 Hz)	8	II .
	On (537 Hz)	5.6	II .
22	On (537 Hz)	5.6	11
23		5.6	II .
24	On (537 Hz)	5.6	11
	On (537 Hz)	5.6	II II
	On (537 Hz)	5.6	II .
27		2.8	Looking Upward
28	Off	4	II .
29	Off	5.6	"
30	On (537 Hz)	2.8	п
	On (537 Hz)	4	II .
	On (537 Hz)	5.8	п



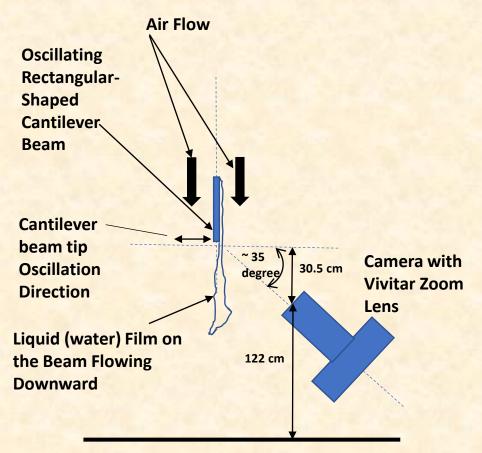












In this schematic diagram, the liquid Sheet is on the cantilever rectangular-shaped piezoelectric beam and flows downward in this page. Gravity direction is downward. Camera to subject distance is 81.3 cm. Flash light orientation is the same as before. (Flash light to subject distance is 30.5 cm).

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Oscillatio				for the Pictures	١
		Taken			i
	_	SA 32			ı
	_Camera S	Shutte	er is C	pen	ı
Frame #	Oscillation	F/#		Camera View	ı
				Direction	10.0
1			8	Perpendicular to	
				Liquid Film	ı
2	- 66		1	"	I
	Off		1	"	I
	Off		1	"	ı
	Off		1		w III
	Off		1	"	l
	Off		1	"	ı
	Off		1		ı
9	Off		5.6	"	ı
10	Off		1	п	l
11	Off		2	II .	1160
12	Off		2	n n	i
13	Off		2	II .	ı
14	Off		8	"	ľ
15	On (537 Hz)		8		ı
16	On (537 Hz)		8	=	
17	On (537 Hz)		8	"	1000
18	On (537 Hz)		8	п	ı
19	On (537 Hz)		8	п	I
20	On (537 Hz)		8	п	
	On (537 Hz)		5.6	п	
	On (537 Hz)		5.6	п	ACCESSED.
	On (537 Hz)		5.6		
	On (537 Hz)		5.6		
	On (537 Hz)		5.6	n n	
	On (537 Hz)		5.6	· ·	
	Off		2.8	Looking Upward	
	Off		4	"	
	Off		5.6	п	
	On (537 Hz)		2.8	"	I
	On (537 Hz)		4	"	
	On (537 Hz)		5.8	п	I

