

## APPENDIX THREE

### PASI OPUS 14 PIPE SCALES

The scale of a pipe commonly refers to the ratio of the pipe length to its diameter, a dimension that factors prominently in determining the basic timbre of a given pipe. However, several other physical characteristics also help to shape the distinctive tone of a pipe, such as the thickness and angle of the languid, the width and height (“cut-up”) of the pipe mouth, and the material out of which the pipe is made. Certain kinds of pipes may have distinctive architectural features such as chimneys (i.e. the Rohrflöte) or roller beards mounted in front of the pipe mouth (e.g. the Gamba). Reed pipes are distinguished by style of shallot, thickness of the tongue (reed) and by a variety of resonator shapes and dimensions.

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## Mixture Compositions

### HAUPTWERK

Mixture 1 1/3' V	C	c <sup>0</sup>	f <sup>#0</sup>	c <sup>1</sup>	c <sup>2</sup>	c <sup>3</sup>
	-	-	-	4'	4'	4'
	-	-	2 2/3'	2 2/3'	2 2/3'	2 2/3'
		2'	2	2'	2'	2'
	1 1/3'	1 1/3'	1 1/3'	1 1/3'	1 1/3'	-
	1'	1'	1'	-	-	-
	2/3'	2/3'	2/3'	-	-	-
	1/2'	1/2'	-	-	-	-

Mixture 1' IV	C	c <sup>0</sup>	c <sup>1</sup>	c <sup>2</sup>	c <sup>3</sup>
	-	-	-	-	4'
	-	-	-	2 2/3'	2 2/3'
	-	-	2'	2'	2'
	-	1 1/3'	1 1/3'	1 1/3'	-
	1'	1'	1'	1'	-
	2/3'	2/3'	2/3'	-	-
	1/2'	1/2'	-	-	-
	1/3'	-	-	-	-

### OBERWERK

Mixture 1' IV	C	c <sup>0</sup>	f <sup>#0</sup>	c <sup>1</sup>	c <sup>2</sup>	c <sup>3</sup>
	-	-	-	-	4'	4'
	-	-	-	2 2/3'	2 2/3'	2 2/3'
	-	-	2	2'	2'	2'
	-	1 1/3'	1 1/3'	1 1/3'	1 1/3'	-
	1'	1'	1'	1'	-	-
	2/3'	2/3'	2/3'	-	-	-
	1/2'	1/2'	-	-	-	-
	1/3'	-	-	-	-	-

### UNTERWERK

Mixture 2' V	C	c <sup>0</sup>	c <sup>1</sup>	c <sup>2</sup>	c <sup>3</sup>
					5 1/3'
			4'	4'	4'
		2 2/3'	2 2/3'	2 2/3'	2 2/3'
	2'	2'	2'	2'	2'
	1 1/3'	1 1/3'	1 1/3'	1 1/3'	-
	1'	1'	1'	1'	-
	2/3'	2/3'	-	-	-
	1/2'	-	-	-	-

### PEDAL

Mixture 2 2/3' V	C-f <sup>1</sup>
	2 2/3'
	2'
	1 1/3'
	1'
	2/3'
	1/2'

## Pipe Scales - Flues

### HAUPTWERK

	C	c <sup>0</sup>	c <sup>1</sup>	c <sup>2</sup>	c <sup>3</sup>	c <sup>4</sup>
<b>Praestant 16'</b>						
<i>C-C<sup>0</sup> Wood Haskell (see Pedal 16')</i>						
Diameter	254	150	84	49	31	17
Cut-up	51	31	21.7	11.3	6.9	4.5
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	8.5	5.7	3.5	2.3	1.7	1.1
Material	97% Lead					
<b>Octave 8'</b>						
Diameter	155	90	50	31	20	9
Cut-up	30	21.3	11.5	6.8	4.6	2.3
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	5.9	3.7	2.3	1.7	1.2	0.7
Material	97% Lead					
<b>Rohrflöte 8'</b>						
Diameter	122	76	51	33	22	16
Cut-up	40.2	24.3	16.3	9.2	4.7	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Rohr Diameter	-	16	12	9	7	5
Rohr Length	-	110	58	31	16	9
Languid Thickness	4.7	3.2	2.3	1.75	1.3	1
Material	97% Lead					
<b>Salicional 8'</b>						
Diameter	120	69	43	26	15	9
Cut-up	25.8	14.9	9	5.8	3.2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	4.6	3	2.1	1.5	1	0.7
Toe Hole	-	6	4.5	3.2	2.2	-
Material	97% Lead					

<b>Octave 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	83	48	28	18	10.5	5.5
Cut-up	20.1	11	6.8	4.2	2.7	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	3.5	2.2	1.6	1.1	0.75	0.55
Material	97% Lead					
<b>Spitzflöte 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Lower Diameter	85	58	40	27	18	12
Upper Diameter	50	32	21	13	8	7
Cut-up	19.8	12.8	8.1	4.9	3.3	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	3.5	2.4	2	1.5	1.1	0.8
Material	97% Lead					
<b>Quinte 2 2/3'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	58	34	20	10.5	6.5	4.5
Cut-up	14	7.9	6.4	3.1	1.8	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.4	1.8	1.2	0.7	0.6	0.5
Material	97% Lead					
<b>Superoctave 2'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	47	27	17	10	6	3.7
Cut-up	10.6	6.2	4	2.5	1.4	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.2	1.55	1.1	0.7	0.55	0.45
Material	97% Lead					
<b>Mixture 1 1/3' V</b> <i>Scales based on 2'</i>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	46.3	25.3	14.8	9.7	6.2	4
Cut-up	10.6	6.2	4	2.5	1.4	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.2	1.45	1	0.7	0.55	0.5
Material	97% Lead					

<b>Mixture 1' IV</b>		<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
<i>Scales based on 2'</i>							
	Diameter	43	23.5	13.5	9	5.7	3.8
	Cut-up	10.6	6.2	4	2.5	1.4	-
	Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
	Languid Thickness	2.1	1.35	1.1	0.7	0.55	0.45
	Material	97% Lead					
<b>Cornet V</b>		<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>		
<b>8'</b>	Diameter	51	33	22	16		
	Cut-up	16	8.8	5.5	-		
	Mouth Width	1/4	1/4	1/4	1/4		
	Rohr Diameter	12	9	7	5		
	Rohr Length	58	31	16	9		
	Languid Thickness	2.3	1.75	1.3	1		
	Material	97% Lead					
<b>4'</b>	Diameter	35	23.2	15.8	9		
	Cut-up	7.8	4.9	3.2	-		
	Mouth Width	1/4	1/4	1/4	1/4		
	Languid Thickness	1.8	1.35	1	0.7		
	Material	97% Lead					
<b>2 2/3'</b>	Diameter	28.7	19.6	11.5	7.1		
	Cut-up	6	4.3	2.7	-		
	Mouth Width	1/4	1/4	1/4	1/4		
	Languid Thickness	1.6	1.2	0.75	0.6		
	Material	97% Lead					
<b>2'</b>	Diameter	24.6	17.6	10.8	7		
	Cut-up	4.9	3.3	2	-		
	Mouth Width	1/4	1/4	1/4	1/4		
	Languid Thickness	1.4	1.1	0.7	0.6		
	Material	97% Lead					
<b>1 3/5'</b>	Diameter	20.3	14	8.4	5.3		
	Cut-up	3.8	2.8	1.7	-		
	Mouth Width	1/4	1/4	1/4	1/4		
	Languid Thickness	1.2	0.9	0.65	0.5		
	Material	97% Lead					

OBERWERK

<b>Praestant 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	147	85	47	29	17	8
Cut-up	30.5	21	11.6	7	4.5	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	5.7	3.5	2.15	1.65	1.1	0.6
Material	97% Lead					
<b>Suavial 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	-	-	47	29	17	8
Cut-up	-	-	11.6	7	4.5	-
Mouth Width	-	-	1/4	1/4	1/4	1/4
Languid Thickness	-	-	2.2	1.65	1.1	0.6
Material	97% Lead					
<b>Gedeckt 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	115	76	50	32	20	15
Cut-up	37.2	22	15.1	8.5	4.3	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	4.4	3.2	2.3	1.7	1.2	1
Material	97% Lead					
<b>Octave 4'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	79	45	27	16.5	10.5	5.5
Cut-up	20.5	11.8	7.0	4	2.8	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	3.4	2.15	1.55	1.1	0.7	0.5
Material	97% Lead					

<b>Rohrflöte 4'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<i>Tapered open from e<sup>#3</sup> as in HW 4'</i>
Diameter	84	56	33	21	14	
Cut-up	26	16	9.8	5.4	3.1	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	
Rohr Diameter	14	10.5	8.7	6.3	4.7	
Rohr Length	95	60	35	20	14	
Languid Thickness	3.5	2.4	1.75	1.2	1	
Material	97% Lead					
<b>Octave 2'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	44	25.5	16	10	6	3.7
Cut-up	11.6	7	4.5	2.9	1.8	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.15	1.45	1	0.7	0.55	0.45
Material	97% Lead					
<b>Waldflöte 2'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	54	35	22	15	10	7
Cut-up	11.2	8	4.8	2.8	1.9	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.4	1.8	1.3	1	0.7	0.6
Material	97% Lead					
<b>Sequialtera II</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
<b>2 2/3'</b> Diameter	59	33	19	12	7.4	4.2
Cut-up	14.7	8.9	5.6	3.3	2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.6	1.7	1.2	0.8	0.6	0.5
Material	97% Lead					
<b>1 3/5'</b> Diameter	38	21	13	8	4.9	3
Cut-up	9.9	5.8	3.8	2.7	1.5	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	1.9	1.2	0.85	0.6	0.5	0.45
Material	97% Lead					

<b>Quinte 1 1/3'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	32	18	11.5	7.3	5.2	3.5
Cut-up	8	4.9	3	2.1	1.2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	1.7	1.1	0.75	0.6	0.5	0.4
Material	97% Lead					

<b>Mixture 1' IV</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
<i>Scales based on 2'</i>						
Diameter	44	25.5	16	10	6	3.7
Cut-up	11.5	6.5	4	2.8	1.6	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.15	1.45	1	0.7	0.55	0.45
Material	97% Lead					

### UNTERWERK

<b>Bourdon 16'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	145x175	105	70	42	26	17
Cut-up	58	34	23	13.8	7.3	-
Mouth Width	145	1/4	1/4	1/4	1/4	1/4
Languid Thickness	-	4.1	3	2.1	1.5	1.1
Material	97% Lead					

<b>Principal 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	158	92	51	32	20	9
Cut-up	31	19.3	11	6.5	4.2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	6	3.8	2.3	1.7	1.2	0.7
Material	97% Lead					

<b>Gamba 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Diameter	95	58	36	23	14	8
Cut-up	17.2	11.3	8.3	4.5	2.5	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	3.8	2.5	1.8	1.3	1	0.6
Material	97% Lead					
Toe Hole	10.5	7.5	4.7	3	2	-
Roller Beards	16.2	9.5	6.4	-	-	-



<b>Celeste 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	-	49	31	19	12	7
Cut-up	-	11	8.5	5	3.1	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	-	2.3	1.65	1.2	0.8	0.6
Material	-	97% Lead				
Toe Hole	-	5.5	3.5	2.7	2	-
Roller Beards	-	9	6.4	6.4	-	-

  

<b>Harmonic Flute 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	130	73	55	40	27	15
Cut-up	31	16.2	11.1	9.5	6.8	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	5	3.2	2.4	2	1.5	1
Material	97% Lead					

  

<b>Principal 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	84	49	29	18	10.5	6
Cut-up	19	11	7	4	2.9	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	3.5	2.3	1.65	1.1	0.7	0.55
Material	97% Lead					

  

<b>Harmonic Flute 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	67	52	39	27	18	13
Cut-up	15.5	11	9.0	6	4	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.8	2.4	2	1.5	1.1	0.8
Material	97% Lead					

<b>Nazard 2 2/3'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	59	44	29	20	11.5	8
Cut-up	13.8	9.5	6.8	3.9	2.8	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.6	2.15	1.6	1.2	0.75	0.6
Material	97% Lead					

<b>Octavin 2'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
		<i>Overblowing from c<sup>0</sup></i>				
Diameter	49	35	22	14	9	6
Cut-up	11.8	9	4.8	3	2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.3	1.8	1.3	1	0.7	0.55
Material	97% Lead					

<b>Tierce 1 3/5'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Diameter	46	29	20	14	8.5	4.8
Cut-up	9.8	6.1	4	3.1	2.2	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.15	1.65	1.2	1	0.6	0.5
Material	97% Lead					

<b>Mixture V 2'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
<i>Scales based on 2'</i>						
Diameter	48	28	18	10	6	3.7
Cut-up	11	6.7	4.5	2.3	1.5	-
Mouth Width	1/4	1/4	1/4	1/4	1/4	1/4
Languid Thickness	2.2	1.55	1.1	0.7	0.55	0.45
Material	97% Lead					

## PEDAL

<b>Subbass 32'</b>	<b>C</b>	<b>c<sup>0</sup></b>
Diameter	322 x 383	194 x 228
Cut-up	150	84
Wall Thickness	33	29
Material	Sugar Pine / Douglas Fir	

<b>Praestant 16'</b>	<b>C</b>	<b>c<sup>0</sup></b>		
<i>Wood Haskell</i>				
Diameter	200 x 251	126 x 158		
Cut-up	60	35		
Wall Thickness	20	16		
Material	Poplar			
<b>Subbass 16'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Diameter	194 x 228	120 x 153	70 x 97	40 x 53
Cut-up	78	48	28	16
Wall Thickness	20	16	10	9
Material	Poplar			
<b>Octave 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Diameter	155	93	53	32
Cut-up	30.5	21.2	11.3	-
Mouth Width	1/4	1/4	1/4	1/4
Languid Thickness	5.8	3.8	2.4	1.7
Material	97% Lead			
<b>Gedeckt 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Diameter	117	78	50	33
Cut-up	39.2	24.8	15.5	-
Mouth Width	1/4	1/4	1/4	1/4
Languid Thickness	4.5	3.3	2.3	1.7
Material	97% Lead			
<b>Octave 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Diameter	80	47	26	18
Cut-up	19	11.2	6.9	-
Mouth Width	1/4	1/4	1/4	1/4
Languid Thickness	3.4	2.2	1.5	1.1
Material	97% Lead			
<b>Mixture V 2 2/3'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
<i>Scales based on 2 2/3'</i>				
Diameter	60	35	22	12
Cut-up	14.5	8.3	5.2	-
Mouth Width	1/4	1/4	1/4	1/4
Languid Thickness	2.6	1.8	1.3	1.8
Material	97% Lead			

## Pipe Scales - Reeds

### HAUPTWERK

<b>Trumpet 16'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Upper Diameter	160	110	85	68	54	44
Lower Diameter	25	19	15	12	9	6
Length	4400	2200	1065	600	280	115
Material	97% Lead					
Shallots	German					
Tongue Thickness	0.95	0.5	0.35	0.25	0.14	-
<b>Trumpet 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Upper Diameter	120	93	70	58	48	40
Lower Diameter	21	15.5	11	8	7	7
Length	2150	1050	540	260	120	43
Material	97:% Lead					
Shallots	German					
Tongue Thickness	0.5	0.35	1/4	0.14	0.1	-
<b>Trompette 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Upper Diameter	120	90	75	60	50	43
Lower Diameter	15	12	9	7.2	6	5.5
Length	2100	1050	540	251	113	50
Material	97% Lead					
Shallots	Open, round shallots with lead plugs					
Tongue Thickness	0.53	0.47	0.23	0.18	0.1	-
<b>Vox Humana 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>	<b>c<sup>3</sup></b>	<b>c<sup>4</sup></b>
Length Upper	39	41	21	26	20	-
Length Lower	162	118	101	71	51	-
Diameter Top	14.3	12.8	11.5	11.8	14.8	-
Diameter Middle	52	40.5	34	30.5	28.5	-
Diameter Bottom	17	14	11.5	8.5	7	-
Material	97% Lead					
Shallots	German					
Tongue Thickness	0.57	0.4	0.25	0.15	0.1	-

### OBERWERK

<b>Dulzian 16'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>	
Upper Diameter	60	48	37	28	22	18	
Lower Diameter	22.5	17	15.3	12.2	7.5	7	
Cylinder Length	1250	600 / 1170	550	255	70	40	
Cone Length	360	255 / 312	225	115	61	33	
Material	97% Lead						
Shallots	German						
Tongue Thickness	0.73	0.5	2/7	0.2	0.14	-	
<b>Trichterregal 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Stem Upper Diameter	27	24	19	18.7	18	14	11
Stem Lower Diameter	21	15.7	12.2	11	8.9	8	7
Stem Length	850	425	170	157	135	85	34
Cone Upper Diameter	75	61	48	44.6	38.5	31	25
Cone Length	110	88	70	69	66	48	32
Material	97% Lead						
Shallots	German						
Tongue Thickness	0.45	0.35	0.2	0.18	0.14	0.1	-

### UNTERWERK

<b>Bassoon 16'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>	
Upper Diameter	125	97 / 97	80	62	44	40	
Lower Diameter	25	19 / 19	15	12	9	6	
Length	2260	1110 / 2250	1100	550	250	140	
Material	97% Lead						
Shallots	Tapered, German-style						
Tongue Thickness	0.73	0.53	0.33	0.22	0.14	-	
<b>Trompette 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>	
Upper Diameter	95	82	71	58	50	43	
Lower Diameter	12	9.5	8.2	7.2	6	5.5	
Length	2210	1117	546	251	113	50	
Material	97%						
Shallots	Open, French-style						
Tongue Thickness	0.48	0.34	0.27	0.15	0.08	-	

<b>Oboe 8'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Stem Upper Diameter	67	50	44 / 25.5	17.2	11.8	8
Stem Lower Diameter	14	12	9 / 9	8	7.5	7
Stem Length	2137	1050	530 / 404	158	53	22
Bell Upper Diameter	-	-	51	42	36	30
Bell Cone Length	-	-	147	100	60	42
Material	97% Lead					
Shallots	Open, French-style					
Tongue Thickness	0.45	0.35	0.27	0.2	0.1	-

<b>Clairon 4'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>	<b>e<sup>3</sup></b>	<b>e<sup>4</sup></b>
Upper Diameter	82	70	50	44	40	-
Lower Diameter	12	9.5	8.2	7.2	6	-
Length	1100	530	255	118	50	-
Material	97%					
Shallots	Open, French-style					
Tongue Thickness	0.37	0.23	0.18	0.1	-	-

#### PEDAL

<b>Trombone 32'</b>	<b>C</b>	<b>e<sup>0</sup></b>
Upper Diameter	252 x 252	194 x 194
Lower Diameter	40 x 40	40 x 40
Length	8900	4480
Material	Poplar	
Shallots	German, with wood faces	
Tongue Thickness	1.6	1.05

<b>Posaune 16'</b>	<b>C</b>	<b>e<sup>0</sup></b>	<b>e<sup>1</sup></b>	<b>e<sup>2</sup></b>
Upper Diameter	220	146	110	80
Lower Diameter	33	22	18	14
Length	4480	2230	1065	520
Material	97% Lead			
Shallots	German			
Tongue Thickness	1.05	0.63	0.46	-

<b>Trumpet 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Upper Diameter	130	100	73	58
Lower Diameter	21	15.5	11	8
Length	2150	1050	540	260
Material	97% Lead			
Shallots	German			
Tongue Thickness	0.5	0.35	0.25	-
<b>Trompette 8'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Upper Diameter	170	145	110	82
Lower Diameter	15	12	9	6
Length	2350	1200	650	330
Material	97% Lead			
Shallots	Open, round shallots with lead plugs			
Tongue Thickness	0.5	0.34	0.23	-
<b>Clairon 4'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Upper Diameter	78	55	44	36
Lower Diameter	15.5	11	8	7
Length	1030	510	270	140
Material	97% Lead			
Shallots	German			
Tongue Thickness	0.3	0.23	0.14	-
<b>Cornet 2'</b>	<b>C</b>	<b>c<sup>0</sup></b>	<b>c<sup>1</sup></b>	<b>c<sup>2</sup></b>
Upper Diameter	58	44	39	36
Lower Diameter	10.5	8.5	7	7
Length	495	230	110	75
Material	97% Lead			
Shallots	German, open			
Tongue Thickness	0.25	0.15	0.1	-