APVolution S

Lithium Disilicate

MANUAL



2025

APVolution S

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Warnings

Only to be used by trained personnel.

When working on ceramic restorations, wear safety glasses and remove dust and fragments by suction.

Be careful with high firing and pressing temperatures to avoid burns—use oven tongs and heat-resistant gloves!

Firing conditions may vary due to differences in ceramic ovens on the market. Account for this variation; it is the client's responsibility. Indicated firing temperatures are approximate values only.

Warning for Investment Material:
The investment material contains quartz powder. To avoid inhaling dust, wear a protective mask and safety glasses, and read the warnings on the packaging.

Inhaling investment dust can harm the respiratory system and lungs.



1. Overview

APVolution S

Press Ingots & Layering Powders

for
Single Crowns" and Smaller Three-Unit Bridges

Single crowns pressed and stained



HT A1 Ingot: One Stain and Glaze Cycle

2. Material Indications and Contraindications

The Aesthetic Press pressable ingots are based on a high-strength glass-ceramic, with colors designed to match the VITA Classical Shade Guide.

APVolution S is intended for dental applications by trained professionals.
Mechanical strength and optical properties qualify APVolution S for pressing all-ceramic single-unit restorations (anterior and molar crowns, veneers, inlays, partial crowns/onlays, and three-unit anterior bridges).

Observe all minimum wall thicknesses and connector cross-sections mentioned.

Pressed objects may be completed using the layering or staining technique with Aesthetic Press APVolution layering porcelain, AP stains or AP Chroma shades, and AP glaze.



Contraindications:

- Do not use in combination with materials from other manufacturers besides the specified Aesthetic Press products and/or materials.
- Do not manufacture non-mentioned restorations.
- Do not manufacture unspecified restorations with wall thicknesses or connector cross-sections smaller than specified.
- Glass-ceramic restorations (full or partial) are not recommended for patients with bruxism, parafunctional habits, or substantially reduced residual dentition.

Overview of APVolution S Pressable Ingots

APVolution S pressable ingots are offered in four translucency ranges:

HT: High-Translucency Ingots for Staining Technique
MT: Medium-Translucency Ingots for Staining or Layering Technique
LT: Low-Translucency Ingots for Layering Technique.

Table 1 Indications by Translucency and Technique								
Translucency		Technique		Indication				
		staining	cut-back and layering	Veneer	Inlay	Partial Crown	Anterior Crown	Bridge
High	HT	X		X	X			
Medium	MT	X	X	X	X	X	X	X
Low	LT		X	X		X	X	X

X = Applicable indication.

Preparation Guidelines and Minimum Restoration Thicknesses

Tooth preparation follows common rules for all-ceramic restorations:

- Deep chamfer or shoulder preparation with rounded inner edges
- Rounded edges, angles, and inner shoulders
- Retentive surfaces with sufficient height for conventional cementation

Minimum wall thicknesses for indicated restorations and firing techniques, plus connector cross-sections, are given in the following table:

Reference: "*Methodical Tooth Preparation for Predictable Esthetic Excellence*", by Robert Ritter DMD, Published Inside Dentistry , March 2011

Preparation Guidelines in Detail:

		Veneer	Inlay	Onlay	Crown		Three-Unit-Bridge	
					anterior	posterior	anterior	praemolar
Staining	circular	0.3-0.6 mm	1 mm	1.5 mm	1.2 mm	1.5 mm	1.2 mm	1.5 mm
Cutback	incisal/occlusal	0.4-0.7 mm	1 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Layering	circular	0.6 mm			1.2 mm	1.5 mm	1.2 mm	1.5 mm
	labial/occlusal	0.4 mm			0.4 mm	0.8 mm	0.8 mm	0.8 mm
	incisal/occlusal				0.6 mm	0.8 mm	0.8 mm	0.8 mm
	in general				anatomically reduced tooth shape			
	connector cross section						16 mm	16 mm
	max pontic width						11 mm	9 mm

Caution: 50% of the total restoration dimension must be made in high strength pressable ceramic! In case of excess space always compensate the dimensions in high strength pressable ceramic APVolution S and not in layering porcelain.

Model Preparation

Prepare a segmented plaster working model as usual.
Apply spacer in one or two layers according to the preparation:

- For partial crowns, crowns, and veneers: Apply two layers up to 1 mm apical to the preparation margin.
- For inlays and onlays: Apply two layers to walls and three layers to the bottom, up to 1 mm from the preparation margin.

3. Ingot Selection

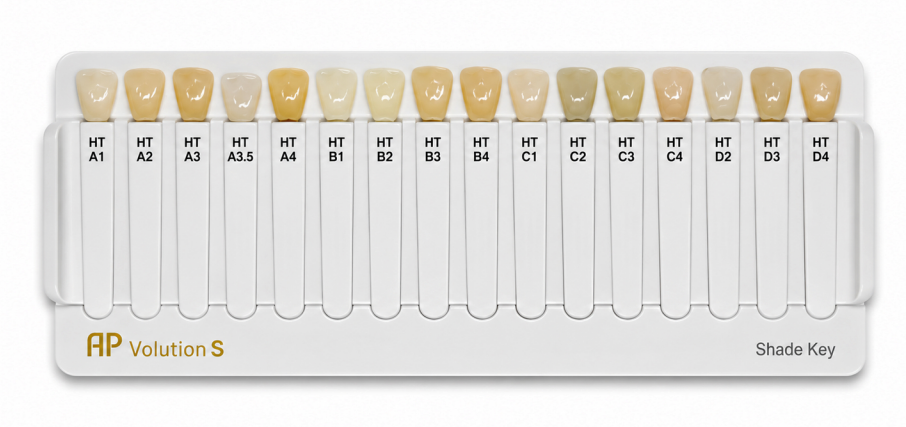
There are four main ingot opacity categories:

- **HT: High-Translucency Ingots for the Press and Staining / or Press and Layering technique for single crowns (depending on situation and color effects)**
- MT: Medium-Translucency Ingots for the **Press-and-Layering** technique
- LT: Low-Translucency Ingots for the **Press-and-Layering** technique
- Bleach: Ingots for the **Press and Layering** or **Press and Staining** Technique

All ingots are available in 3.0 g size

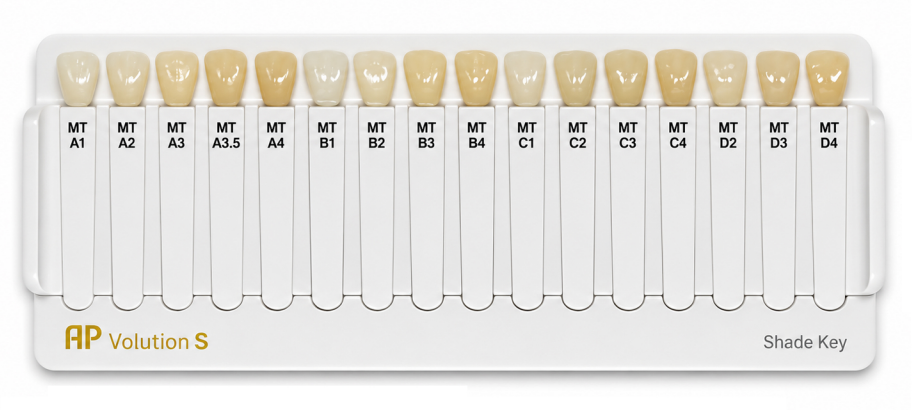
High-Translucency Ingots

The APVolution S HT Ingots are available in the following shades:



HT
A1, A2, A3, A3.5, A4; B1, B2, B3, B4; C1, C2, C3, C4; D2, D3, D4

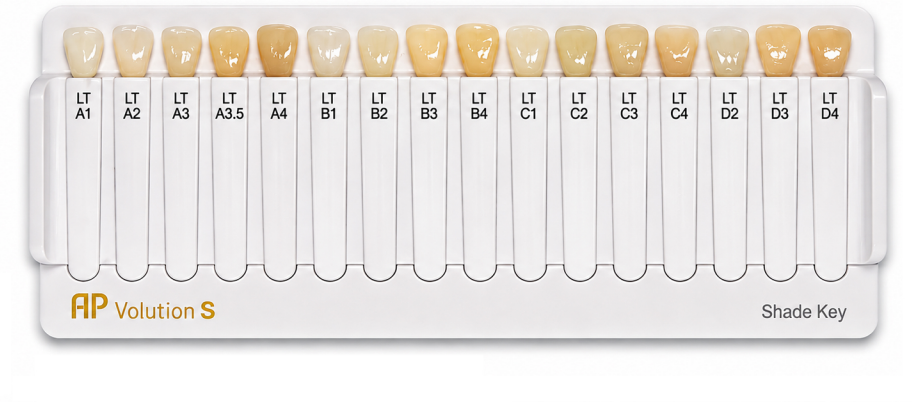
Medium-Translucency Ingots



The APVolution S MT Ingots are available in the following shades:

MT
A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4

Low-Translucency Ingots



The APVolution S LT Ingots are available in the following shades

LT	MT	HT
BL1, BL2, BL3, BL4	BL1, BL2, BL3, BL4	BL1, BL2, BL3, BL4

Bleach Ingots



The APVolution S Bleach Ingots are available in the following shades

LT	MT	HT
BL1, BL2, BL3, BL4	BL1, BL2, BL3, BL4	BL1, BL2, BL3, BL4

Press Temperatures

Press Program									
Ring Size	**Idle**	Rising Temp	End Temp	Hold Time	Vac on	Vac off	Ring size	Press-Level	Ivoclar Stop Speed
200 g	**900˚C**	max	920˚C	18 min	700˚C	920˚C	200g	L5	300

Note: Temperatures can vary widely in different furnaces. This chart work well for the DEKEMA 654 press-i-dent

Firing Chart for Build-Up Powder

Build Up-Powder							
	Idle Temp	Rising ˚C/ min	Final Temp	Pre Heat	Hold Time	Vac on	Vac off
Build-Up Powder	400˚C	55˚C	780˚C	6 min	1 min	450˚C	780˚C
Glaze-Bake	400˚C	55˚C	775˚C	6 min	1 min	-	-

Note: Temperatures can vary widely in different furnaces. This chart work well for the DEKEMA 654 press-i-dent

4. Spruing Rules

Problem: Many spruing instructions state that you must comply with certain rules.

Solution: According to the author's experience, some complex spruing rules are good but not absolutely necessary.

Introduction:

Working with Aesthetic Press press ceramics makes it clear that some spruing rules are not absolutely necessary.

The key parameters to consider are the following:

- **Length**
- **Diameter**
- **Angel**
- **Shape**

After years of experience, the author uses 0.3–3 cm (0.12–1.18 inches) sprue lengths to achieve these results.

The diameter of the sprues should be 3 mm, or gauge 8

There is no mandatory fixed angle rule. In general, keep sprue lengths as short as possible to minimize material usage.

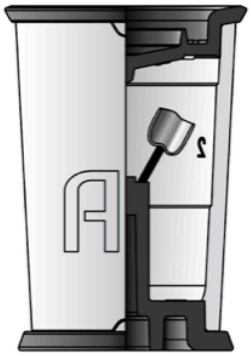
Since no minimum sprue length is required, leave at least 2 mm distance to the crown when cutting sprues. This avoids excessive heat in “cuspal regions”, which can cause cracks.

The most important rule is to keep sprues clean and smooth. Poorly finished waxed-up areas increase the risk of investment embedding into the ceramic.
Spruing angles can easily be 30–90 degrees.

Angulation of Sprues:

-45 degrees is ideal but not mandatory-

Place sprues at the edge of the main “plunger-channel” stand. This positions the object in the warmer region of the muffle, avoiding sprued objects in the middle.
The distance of the crown to the mold bottom or walls, should be at least 0.75 cm (0.3 inches).



45° recommended angle for single units



Three units recommended per ring



Divested units - see angulation of sprues



No reaction layer due to Easy Vest Premium investment

5. AP Investment - Easy Vest Speed *Premium*

No reaction layer on lithium disilicate!



<u>Speed Investment for all pressable ceramics.</u>

The AP Phosphate Bonded Investment material was specially developed to press lithium disilicate ingots.
At the same time, this type of investment material can be used for regular pressing techniques over metal or zirconia, as well as for casting alloys.
AP offers this high-tech type of investment material for Hi-Noble and long-span superstructures, as well as non-precious and pressable investments. The Easy-Vest is an extremely high-quality product, which has been specifically designed to produce consistently accurate castings. Due to the fine material, the castings/press units show a smooth surface, which is important for the fit of metal frames and pressed porcelains.

Mixing Ratio for APVolution S and Easy Vest Speed Premium Investment:

AP Volution S	100 g 14 ml Liquid - 9 ml Water	200g 28 ml Liquid - 18 ml Water

General Rule:

The higher the liquid concentration, the more expansion will be achieved.
Keep the mixing bowl clean and slightly moist before use. Do not wipe with a towel!

Investing Procedure for Pressable Ceramics

It is suggested to mix the investment for 30 seconds by hand first, before mixing under vacuum for 150 seconds.

Bench Set Time

After investing, it is required to wait 15 minutes before placing the ring in the preheated furnace (850°C).

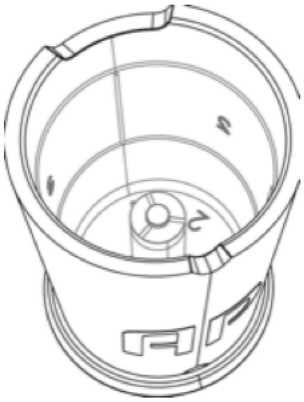
Hold times:

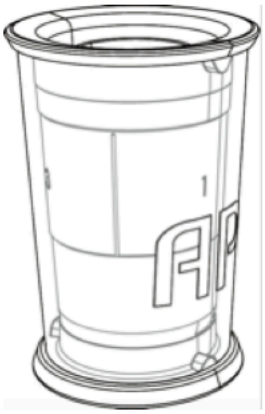


Warnings

1. Investment contains silica – avoid inhaling dust, as it poses a danger to the lungs and respiratory system.
2. Do not open the furnace during the burnout phase – wax steam might catch fire in the air.

AP 200g Investment Ring





AP Investment Rings

The AP investment rings show their numbered sections on the bottom part, on the inside of the ring, and on the top part.

Always align units starting from sector one. This will help shorten the divesting cycle. It is important to know where the invested units are, so that one can trim the pressed ring in various directions.

Mixing and Filling the Investment

After mixing the investment for 120 seconds under vacuum, the Easy-Vest Speed Premium exhibits a nice flow characteristic. The ring can be filled rapidly without fear of bubbles. The key to a nice and clean result lies in the angulation of the units to be pressed.



Simple spruing angulation for single units. Place sprue straight onto the incisal edge to avoid bubbles on the occlusion.



Choose this angulation for posterior bridges



Keep the angulation open to avoid bubbles



Fill up the ring up to upper line on the inside of the silicone ring





Place the lid firmly onto the rubber ring and let the excess material flow through the overflow holes. Remove the lid and ring after a 15-minute bench set time. Due to the tapered geometry, the set investment will be released effortlessly. Clean the rubber immediately, as due to the warmth of the investment material, the rubber is soft and easy to clean





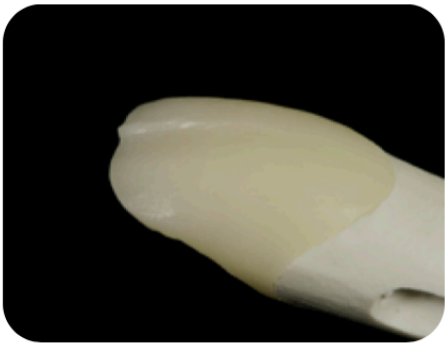
The 200 g ring with the bottom and top part. The plunger maker can be filled with the investment material used to invest the regular units. Make sure not to use high expansion ratios. A 50% expansion ratio for the press over porcelain and respectively the plungers are recommended.

6. Preparation and internal staining technique



The anterior restoration is fitted to the model after the diagnostic wax-up is pressed with the APVolution S ingots, ensuring an accurate fit.





Make a precise reduction for the enamel and translucent layers from the incisal edge to the margin. This ensures optimal thickness of various translucent materials to control color and value.

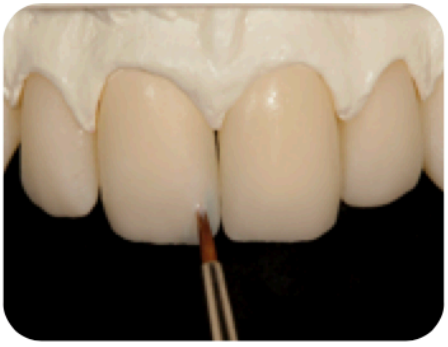


The margin stain is added to the cervical area to avoid too translucent porcelain ares. In case of discolorations, the margin stain can cover these areas.



Mamelon stains are used to match the incisal characteristics. The intense orange can be placed on the right place with the desired intensity. This technique is by far more controlled and predictable and will lead the technician to a successful result, with no shrinkage or color surprises
With just one staining cycle, a most lifelike result is achieved with the fluorescent Effect Stains and the Mamelon Stains.





At the mesial corner, add a touch of blue stain for translucency. To create contrast in the color scheme and highlight the mesial ridge, place white stain to increase value.





A slight amount of orange will add some “lively-appearance” to the anterior. Apply it in small amounts so it does not stand out too much.





Much like the mesial, highlight the distal line angle with white stain. Distally, add a soft tone of translucent blue. These characteristics should reflect those shown on the lower incisors.

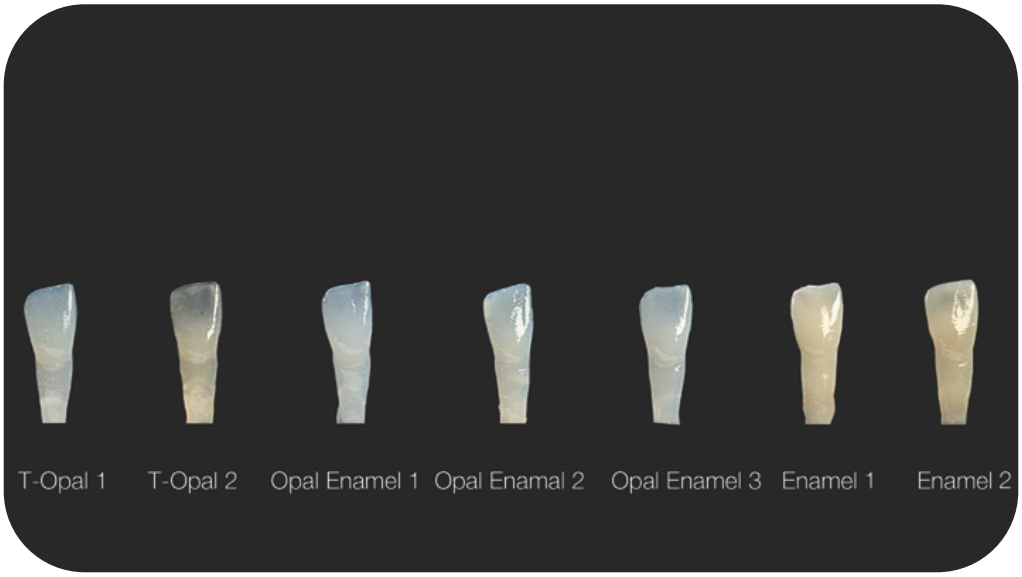


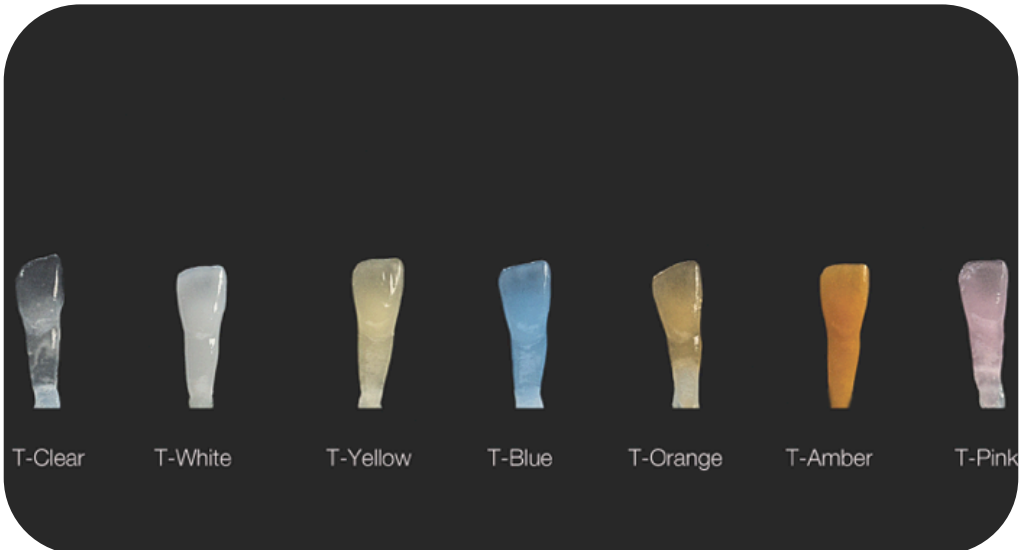
**The stain kit from Aesthetic-Press offers a fluorescent paste, which has a wide temperature range for Low Fusing porcelains and up to High Fusing temperatures.
The range can be from 750 C to 930 C**



Even for full zirconia crowns the paste offers a wide range of options to achieve lifelike and matching colors.

Firing Chart Build Up-Powder APVolution S&							
	Idle Temp	Rising ˚C/ min	Final Temp	Pre Heat	Hold Time	Vac on	Vac off
Build Up Powder	400	55	780	6	1	450	780
Glaze Bake	400	55	775	6	1	-	-





The indicators show the color and variety of appearance due to different thicknesses. These indicators are all hand-made and individually finished.

We recommend that every technician fabricate such indicators to truly understand the porcelain used. This will also allow for a true comparison of the individual brands on the market.

7. Layering Technique

The Aesthetic-Press S&Z Powders are available for:

Aesthetic-Press APVolution S ingots	APVolution S&Z Powders are compatible for these pressable ingots.

The following Shades are available

These Aesthetic-Press Dentin Shades for powder porcelains are available:

Liner	L1	L2	L3	L4	L5		A	B	C	D						
Dentin	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Opaque Dentin	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Enamel	E1	E2	E3	E4		S57	S58	S59	S60							
Opal	OE1	OE2	OE3	TO1	TO2	TO3										
Modifier	A	B	C	D		White	Yellow	Orange	Brown	Pink	Violet	Blue				

See photos on page 26/27

Dentin-Bake

Mix ceramic powder (Dentin and/or Incisal) with Modeling Liquid to a creamy consistency. Apply Dentin or Incisal ceramic in small portions to the cervical and interdental area and compact by light vibration. Then more Dentin or Incisal is applied according to the tooth layering.

1st Bake

After the Dentin application the crown is placed on a firing tray at a starting temperature of 400°C. Subsequently the furnace is closed with a 6 minute closing time and then heated at 55 C/min with vacuum (vacuum starting at 450°C) to 780°C (bake temperature). Hold time: 1 minute without vacuum. After the first dentin/incisal firing is complete, a second layer of dentin and incisal powders is required to complete the anatomy due to the shrinkage of the porcelain.

2nd Bake

Same procedure as at the first Dentin firing. Any further Dentin firings should be carried out at 780°C

Layering Technique in Detail:

Once the first bake has been establish or alternatively the Dentin core has been pressed with the Aesthetic Press APVolution S ingot, the technician can layer with a selection of enamel and transpa or opalescent materials. Once the dentin core has been established and the internal characteristic are defined with the internal staining technique, the powders can now complete the tooth to the desired anatomical form.



Glaze finish/Glaze Bake

After completely finishing the surface with a diamond instrument, thoroughly clean the crown or bridge. The Aesthetic-Press Glaze paste can be applied in thin layers.
For the color characterization, all conventional Aesthetic Press stains and glaze can be applied and fired.

WARNING: Be careful not to apply the glaze paste too thick. This can lead to whitish spots!

Firing Chart Build Up-Powder APVolution S&Z							
	Idle Temp	Rising ˚C/min	Final Temp	Pre Heat	Hold Time	Vac on	Vac off
Build Up Powder	400	55	780	6	1	450	780
Glaze Bake	400	55	775	6	1	-	-

Porcelain Powders Aesthetic Press APVolution S&Z

The Aesthetic-Press APVolution S&Z Enamel, Transpa & Opalescent Powders are available:

APVolution S&Z Powder						
T Opal 1	T Opal 2	Opal Enamel 1	Opal Enamel 2	Opal Enamel 3	Enamel1	Enamel 2
T-Clear	T-White	T-Yellow	T-Blue	T-Orange	T-Amber	T-Pink

Additional Color Chart:



Gingiva

APVolution S&Z Gingiva Powder & Ingots							
Ingots in 3g						**Powders in 40g**	
Gingiva 1	Gingiva 1	Gingiva 3	Gingiva 4	Gingiva 5	Gingiva 6	Gingiva 7	Gingiva 8



8. Overview Of Colors & Firing Charts

Ingot Shades

The following Aesthetic-Press APVolution S Dentin ingot shades are available:

LT	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	
MT	A1	A2	A3		A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	
HT	A1	A2	A3		A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	
Bleach	LT	LT	LT	LT		MT	MT	MT		HT	HT	HT	HT			
	BL1	BL2	BL3	BL4		BL1	BL2	BL3		BL1	BL2	BL3	BL4			

Press Program							**DEKEM A**	**Stop Speed**
Idle	Rising Temp	End Temp	Hold Time	Vac on	Vac off	Ring size	Press Level	E
900	max.	920*	18	700	920	200g	L5	100

Firing chart for internal staining						
Idle	Dry time	Rising temp	End Temp	Holding time	Vac on	Vac off
450	6	55	770	1	-	-

Build Up-Powder							
	Idle Temp	Rising ˚C/min	Final Temp	Pre Heat	Hold Time	Vac on	Vac off
Build Up Powder	400	55	780	6	1	450	780
Glaze Bake	400	55	775	6	1	-	-

9. Technical data

Aesthetic-Press APVolution Powder Porcelain

Material information:
Material: silicate glass ceramic

Chemical composition: mayor components bonded to the glass ceramic structure:

SiO_2, Al_2O_3, Li_2O, P_2O, P_2O_5, Na_2O, CaO, B_2O_3

Classification acc. DIN EN ISO 6872:2015

Classification acc. ISO EN DIN 6872:2015 APVolution S Powder				
Type:	**1☒ 2□**	**class:**	**1□ 2☒ 3□ 4□**	**a☒ b□ c□**

Aesthetic-Press APVolution S ingots		
Coefficient of thermal expansion	DIN EN ISO 6872	pressed 10 x 10^{-6} x K^{-1} 25-500°C
Transformation Temperature	DIN EN ISO 6872	520°C

Technical Data:

Product Description				
Product Name:	APVolution S ingots			
Product reference	various			
Shade:	Special shades	Shade guide	Internal standard	
	A1-A4	Shade guide	V-Shades	
Physical State	paste □	paste □	ingot ⊠	blank □

Indication	
Intended use	Pressable porcelain for single unit restorations and anterior three-unit bridges including second praemolar as terminal post
compatible layering porcelain	APVolution Powder without liner/margin

Material details			
Group of material:	silicate glass ceramic		
Chemical composition:	Major components bonded to the glass ceramic structure: SiO_2, Li_2O, K_2O, Al_2O_3, ZnO, ZrO_2, P_2O_5		

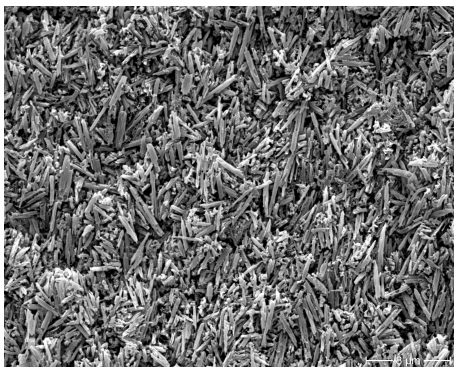
Classification acc. ISO EN DIN 6872:2015 APVolution S Ingots				
Type:	1□ 2⊠	class:	1□ 2□ 3⊠ 4□	a□ b⊠ c□

Physical -chemical properties			
Property	Standard / method		Internal specification
coefficient thermal expansion	no specifications	ISO EN DIN 6872	$10 \times 10^{-6} \cdot K^{-1}$ (± 0.5)
transformation temperature	no specifications	ISO EN DIN 6872	520 °C (± 20)
bending strength	> 400MPa	ISO EN DIN 6872 ch.7.3.2, three/point beding,	> 400 MPa

Physical -chemical properties			
Weibull strength/ modulus	no specifications	ISO EN DIN 6872 ch.7.3.2, three/point beding,	n.a.
fracture toughness	No specification	ISO EN DIN 6872, SEVNB	> 2 MPa√m
chemical solubility	< 100 µg · cm^{-2}	ISO EN DIN 6872	< 60 µg · cm^{-2}
cytotoxicity	no cytotoxicity	ISO 10993-5	n.a.
radioactivity	<1Bq·g^{-1} U^{238}	ISO EN DIN 6872	n.a.

CTE : DIN EN ISO 6972 2 bakes: $9.4 \times 10^{-6} \times K^{-1}$
4 bakes: $9.4 \times 10^{-6} \times K^{-1}$

Transformation temperature DIN EN ISO 6972 635° C



Lithium Disilicate reinforcement increases MPa strength