LuxCreo
Simplify Digital Dentistry

LuxCreo
4D Aligner™

PRODUCT
BROCHURE

FASTER
SMARTER
BETTER

Your Easiest Chairside Solution for Orthodontic Practice!

Contents

About LuxCreo

LuxCreo's mission is to simplify and enable more sustainable production with additive manufacturing.

As a leader in 3D printing solutions, LuxCreo is committed to innovation, product excellence, and customer success. Providing fully integrated solutions – cloud connected 3D printers, AI-enabled printing software, and advanced materials, LuxCreo is transforming the way businesses design and manufacture products in dental, medical, and consumer industries.

Backed by Kleiner Perkins, LuxCreo was founded in the San Francisco Bay Area and has since expanded its U.S. headquarters to Chicago. The company also operates key offices in Beijing, Ningbo, Taipei, and Hong Kong, ensuring a global presence.

For more information, visit LuxCreo.com ***https://luxcreo.com/.***

Contact Us Today to Learn More!

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www.LuxCreo.com

What is 4D Aligner™?

World First "FDA Class II 510(k)" for Direct Print Clear Aligner

• LuxCreo Dental Clear Aligner (DCA) Resin

4D Aligner™ System consists of a series of doctor prescribed, custom-made, thin, clear plastic removable orthodontic appliances (aligners).

They are directly printed from light-cured polyurethane resin. They gently move the patient's teeth in small increments from their original state to a more optimal, treated state.

Printed by High-Speed, Accurate, Chairside Workhorse

• LuxCreo iLux Pro Dental (ILPD) Solution
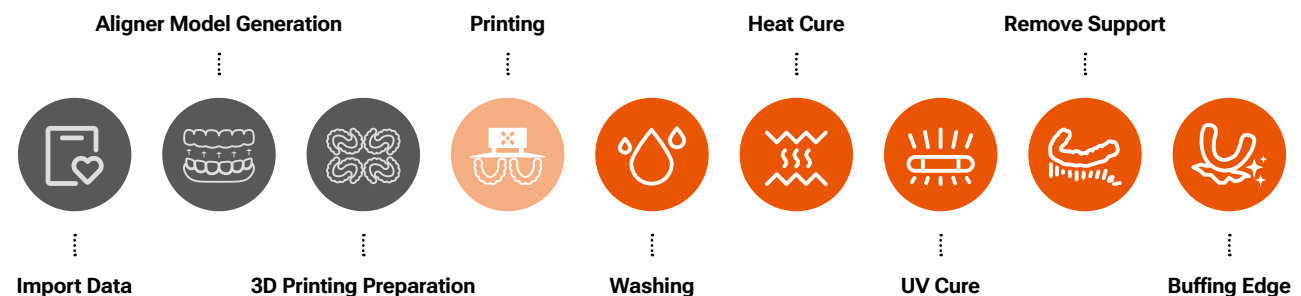
• fastprint.io™ (FPIO) 3D Printing Solution

The 4D aligner system, enhanced by the Integrated LuxCreo Print solution – iLux Pro Dental solution, revolutionizes the production and application of orthodontic aligners directly within clinics, offering significant improvements in efficiency and patient care.

By utilizing LuxCreo's comprehensive system solution, you can streamline your chairside aligner production with efficiency and precision. This solution includes a high-performance DLP printer, a fully automated wash box, a baking box, and a UV curing box, all of which can be conveniently accommodated on a 35' x 20' table within your clinic.

With LuxCreo's advanced chairside printing technology, you can produce and deliver aligners swiftly and effectively. This technology empowers you to maintain control over your practice, prioritize patient-centric care, and consistently deliver high-quality orthodontic products.

LuxCreo 4D Aligner Workflow
vs Outsourced Thermoformed Aligner Delivery

	Aligner Model Generation		Printing		Heat Cure		Remove Support	
Import Data		3D Printing Preparation		Washing		UV Cure		Buffing Edge

Start to Finished Product Delivery
2-3 Hours

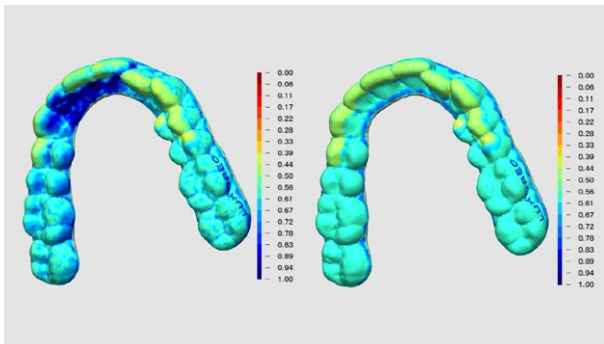**Outsourced Thermoformed Aligner Delivery**
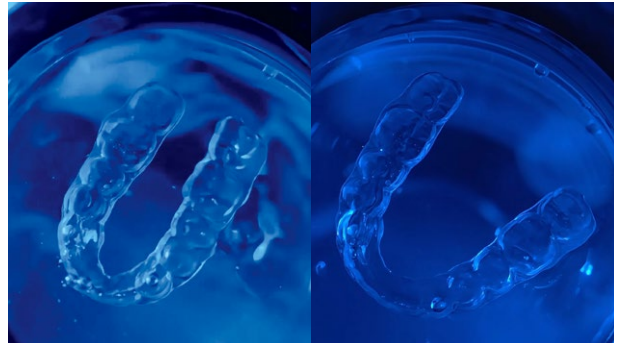**2-4 Weeks**

Why Choose 4D Aligner™?

Multi-Thickness

AI-generated thickness and gap to enhance control and achieve targeted force application
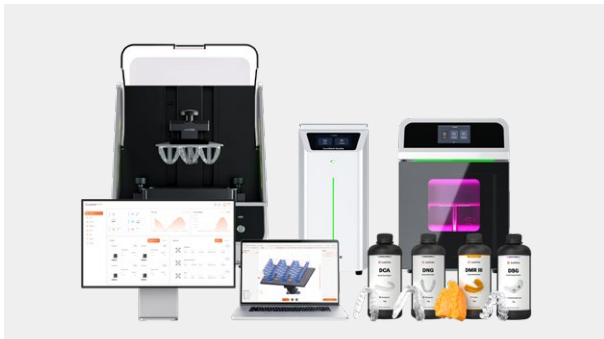

Shape Memory

Maintain perfect shape and protect your oral hygiene with hot water (>60˚C)
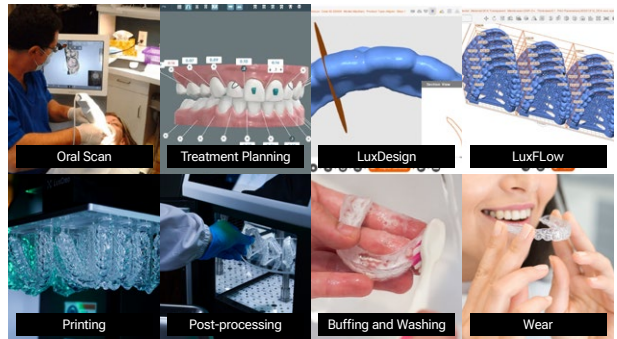

Short Learning Curve with Simple One-Click

Simplified AI trim-line and block-out generation

Faster Turnaround Time

It takes less than 3 hours from scan to delivery, which helps to shorten turnaround time significantly.

Oral Scan | Treatment Planning | LuxDesign | LuxFLow
Printing | Post-processing | Buffing and Washing | Wear

Enhanced Accuracy and Fewer/No Attachments

With enhanced accuracy, some traditional attachments could be replaced. 4D Aligner™ makes more invisible smile and less chair time!
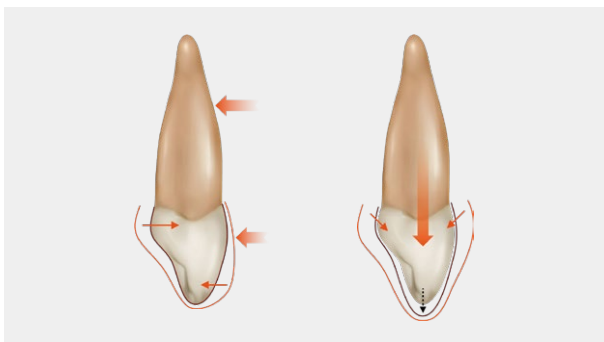
Making Impossible Possible
Unique direct print features

Direct-printed buttons, solid bite ramps, hooks, slits with no more struggling of manual labor

Button | MA | Cut | Hook
Anterior Bite Ramp | Posterior Bite Turbo | Shield | Pontic

What Cases are Suitable for 4D Aligner™?

Teeth Crowding

Teeth crowding occurs when there isn't enough space in the jaw for all of the teeth to fit properly. This can result in overla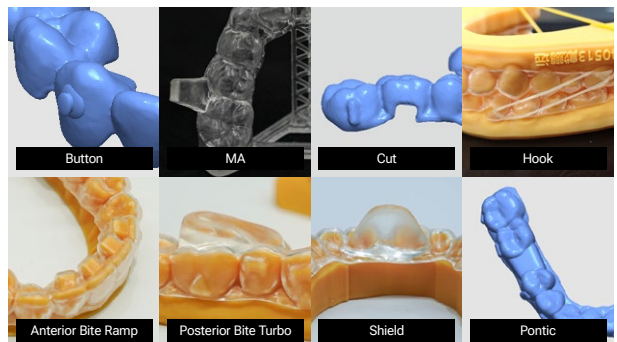pping or crooked teeth, which can make it difficult to clean between teeth and lead to an increased risk of tooth decay and gum disease.

Openbite

Openbite is a condition where the upper and lower front teeth don't touch with each other when biting down. It can make it difficult or painful to bite into certain foods and may also lead to speech problems.

Spacing

Teeth spacing refers to gaps between the teeth. While a small amount of spacing is normal and may not cause any issues, excessive spacing can lead to food getting stuck between the teeth and potential periodontal disease.

Crossbite

A crossbite occurs when some of the upper teeth fit inside of or outside of the lower teeth rather than on top of them. This misalignment can cause uneven wear on certain teeth and potentially lead to jaw pain or dysfunction.

Overbite

An overbite occurs when the upper front teeth overlap significantly with the lower front teeth. This can lead to difficulty chewing food and may also cause wear on the lower front teeth.

Underbite

An underbite occurs when the lower teeth protrude past the upper teeth when the jaw is closed. This can result in an abnormal bite and misalignment of the teeth. It may cause difficulties with chewing, speaking, and overall oral health.

How does 4D Aligner™ Work in Clinic?

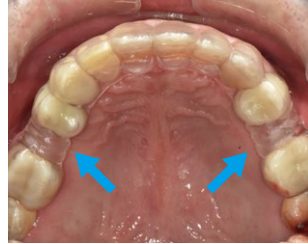## Real-Life Examples of Successful 4D Aligner Treatments

- **Unique Features**

Mandibular Advancement	Pontic

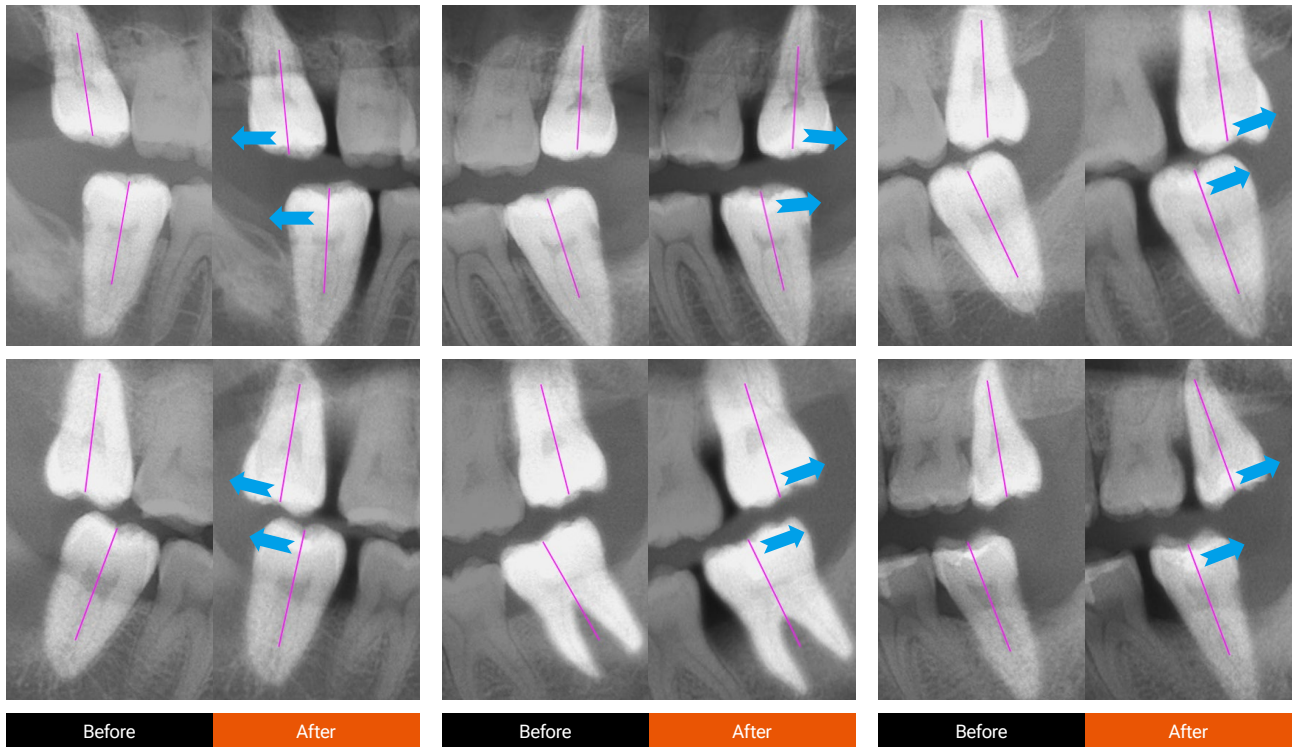|	Hook

Button
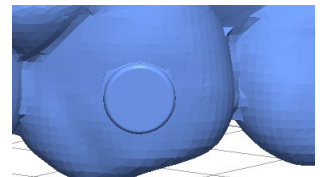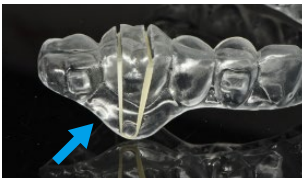
Bite Ramp / Bite Turbo	Tongue Shield

• Bodily Movements in DISTALIZATION - Key biomechanics for Class II cases

Before	After
Before	After
Before	After
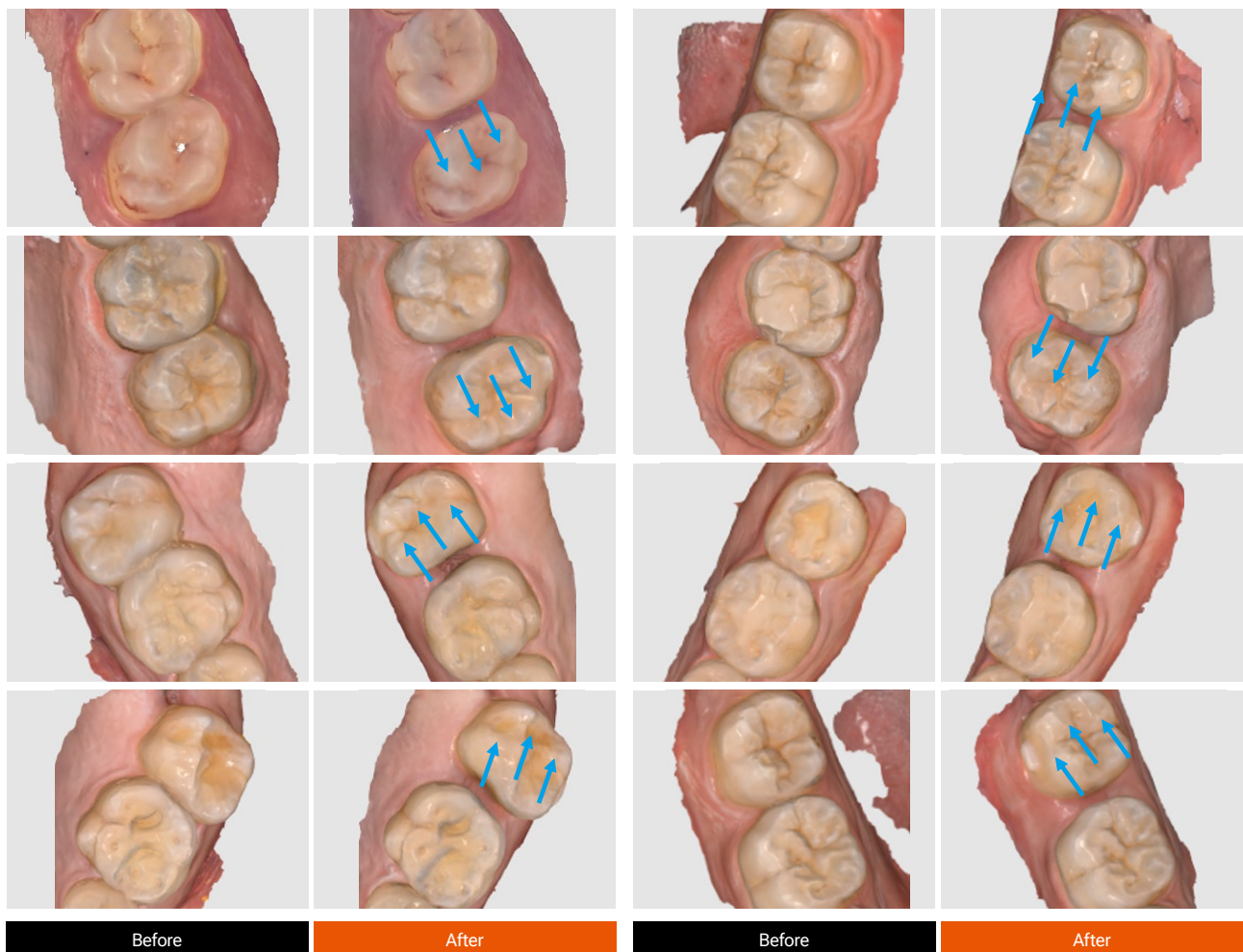
Testimonials from Satisfied Dentists and Patients

Arrange the names in ascending alphabetical order.

> **"**
>
> *The iLux Pro Dental printer and workflow has created a simplified process that has been easy to integrate into our office's digital system. The option to adjust the parameter settings in LuxDesign has created a customized and efficient plan for our patients."*

Dr Lisa Alvetro, MSD
Alvetro Orthodontics

> **"**
>
> *I love my iLux Pro Dental workflow. With easy-to-use software and the FDA-cleared aligner resin, we can produce aligners with variable thicknesses for better aligner therapy. From automated design and nesting to time-saving Digital Polishing™, LuxCreo has thought-out how to drive efficiency for the dental users.*"

Dr Bill Layman, Wharton
DDS, CEO & Founder

> **"**
>
> *The iLux Pro Dental and LuxDesign software has been a game changer for my practice. LuxDesign has saved my practice 60-75% in labor costs compared to the traditional workflow and has slashed waiting times for my patients.*"

Dr Mike Pham, Baylor
Affordable Dental

> "
The introduction of our 1-click workflow has revolutionized our practice. With LuxDesign, aligners are created in minutes and sent to the iLux Pro Dental printer for rapid production. The entire process now takes only 2-3 hours. It's a true game changer for modern dentistry."

Dr Mario E. Tai, DMD. DMSc., Harvard
Tai Orthodontics

> "
Multi-thickness aligners are the future of orthodontic aligner therapy. lt the 'Holy Grail' and LuxCreo invented it. 4D Aligners have a superior fit that thermoformed trays simply cannot achieve, providing better control over torque forces ln moving the teeth. They also require the orthodontist to use fewer attachments on the tooth surface of the patient. When that level of accurate is combined with the ability to design and print variable thickness trays, it yields better control over movements and a better patient experience. "

Dr. Neil Warshawsky, DDS, MS
Get it Straight Orthodontics

> "
With the iLux Pro Dental and clear aligner solution, I've eliminated the waiting or worse rework period after a patient gets their initial scan, as a result my patient chair time is reduced as well as my traditional outsourcing and in-house thermoforming costs, this is a game changer for my practice."

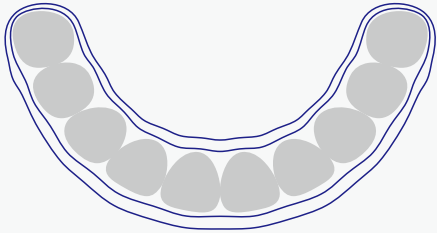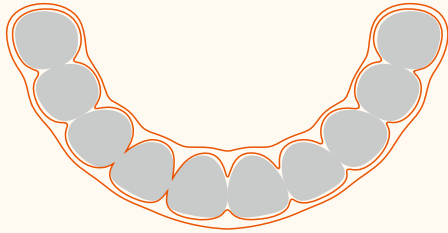**Dr Eric Wu, Upenn**
Wu Orthodontics

Competitor Analysis and Cost Breakdown

How is 4D Aligner™ Compared to Other Thermoformed Aligners?

• **Technical Feature Comparison**

Thermoformed aligners	4D Aligner™
Suitable for Most Cases from Mild to Moderate Complexity*	
• Almost invisible, attachments making it less invisible	• Create more natural smile, with no/fewer attachments
Customization	
• Limited, sometimes need tools to do manually	• Highly customization available • Direct printed unique features • Digital design by AI
Treatment Effectiveness	
• Irreversible creep and stress relaxation	• Shape memory, rejuvenation in hot water to restore strength
Thickness	
• Uniform only	• Uniform thickness • Multi-thickness
Effective Contact with Teeth	
• Cannot be well controlled due to process	• **200% higher**

* Treatment outcomes are dependent on the experience level of the practitioner.

Thermoformed aligners	4D Aligner™

Accuracy (Precise treatment)

- Unstable thickness and tooth fit under micro-CT scan
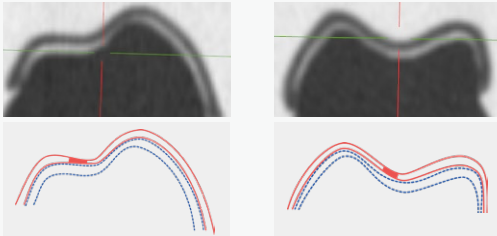
- Consistent thickness and tooth fit under micro-CT scan**
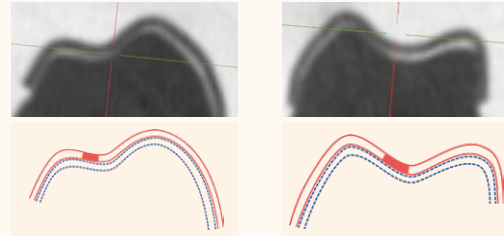

Auxiliary (i.e button, hook, bite ramp)

- Manual sticking or cutting

- All in one printed aligner, less likely to break comparing to manual sticking

Attachments

- Big gap and need large attachments for more contact
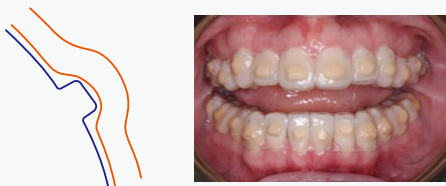
- Small gap with more contact.
- Achieve efficient movements with fewer and smaller attachment.
- Better clamping at undercut makes no attachment possible for treatment!
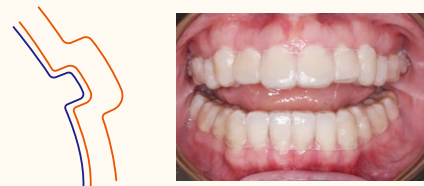
** 4D Aligner under micro CT scan is in unform thickness not multi-thickness.

Cost Breakdown of Chairside Direct Printing VS Chairside Thermoform

In House MAKE Cost Comparison

Thermoform

$15.32

All Amounts in USD

Direct Print LuxCreo

$12.47

Thermoform		Direct Print LuxCreo	
Labor/Service Cost	$3.90	Labor/Service Cost	$2.72
Material cost	$6.92	Material cost	$4.67
Software	$5.00	Software	$5.00
Yield	$0.053	Yield	$0.08
	$15.87		$12.47

19% Cost Reduction

Data Source: Dr. Bill Layman

Instruction for Use of 4D Aligner™

Using aligners created by LuxCreo system is not much different comparing to traditional thermoforming ones.

Wearing Time: Patients should be instructed to wear their 4D Aligners for 20 to 22 hours daily, 7-14 days per tray to achieve optimal results. They should only remove the aligners during meals, brushing, and flossing to maintain oral hygiene and prevent aligner damage.

Initial Fitting: Conduct an initial fitting session when patients receive their aligners. Ensure the aligners fit snugly and comfortably over the teeth, applying the appropriate pressure for effective tooth movement. Provide patients with detailed instructions on how to properly insert and remove the aligners.

Special Instructions:

1. Cleaning: See detailed cleaning process suggestions at next chapter.

2. Eating and Drinking: Instruct patients to remove their aligners before eating or drinking anything other than water to avoid damage and staining.

Check-ups: Schedule regular check-ups every 6 to 8 weeks to monitor patient progress and make any necessary adjustments. These appointments are crucial for ensuring the treatment stays on track.

4D Aligner™ System Contains:

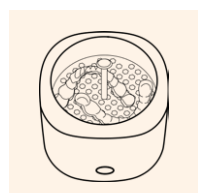| • 4D Aligner™ box	
a) Wear and care guide x1	d) Paper box x1
b) Foil bags of aligner trays x10	e) Chewies x2
c) Aligner container x1	f) Aligner remover x1

• 4D Clean Kit (optional)
a) 4D Ultrasonic cleaner x1
b) Power adapter x1
c) Cleaning tablets x96

Unique and Easy Maintenance

- By submerging aligners in hot water*, your patients can experience shape memory (thermal excitation).

- Submerge aligners in hot water* + cleaning tablet (e.g. Retainer Brite, Polident), to restore 4D Aligner™ to original clarity and original shape.

- For excessive staining, it's recommended to have your patients leave aligners submerged overnight for deep cleansing.

*Hot water = Minimum 60-65°C (standard hot tap water setting). Use 85-100°C (standard for brewing tea/coffee) for faster results.

• For users who have 4D Clean Kit

Step 1:
- Place 4D Aligner™ side by side, <u>teeth cavities face-up</u>, onto the filter rack, into the cleaner.

Step 2:
- Add tap water into cleaner, submerging appliances, below the max water level.
- If you want to clean the appliance, add Polident / Retainer Brite tablet(s).
- Close the lid.

Step 3:
- By one click, enjoy 10 minutes of heating (60 °C) and ultrasonic.
- **TIP: If you are not satisfied with the cleanliness, restart from Step 2 for another cycle.**

Step 4:
- Open the lid to cool down for 5 minutes.
- Use the rack to take appliances out.

Step 5:
- Rinse appliances with cold running tap water.
- Wear freshly rejuvenated appliances.
- **TIP: It is normal for the appliances to feel tighter immediately after rejuvenation.**

• For users who don't have 4D Clean Kit

Step 1:
- Place 4D Aligner™ side by side, teeth cavities face-up, into the microwave-safe container.

Step 2:
- Prepare boiling water (100°C) or hot tap water (60°C-65°C).
- Pour into container, submerging appliances.
- If you want to clean the appliance, add Polident / Retainer Brite tablet(s).

Step 3:
Daily rejuvenation
- Soak for 1-2 hour.
Deep rejuvenation
- Soak for at least 8 hours.

Step 4:
- Add cold tap water until overflowing.
- Continue for at least 1minute to cool.
- **TIP: Place container in sink before adding water.**

Step 5:
- Rinse appliances with cold running tap water.
- Wear freshly rejuvenated appliances.
- **TIP: It is normal for the appliances to feel tighter immediately after rejuvenation.**

⚠ Caution: Use caution and heat-resistant gloves when handling hot water. If you are under the age of 18, or have difficulty safely completing these tasks, please seek the assistance of a parent or guardian.

TIPS

For heavy stain, to enhance the "deep rejuvenation" protocol, consider the following steps:

1. After soaking, rinse the rejuvenated appliances in cold tap water and gently brush remove any tablet residue from the surface. The residue is easily washed away with a gentle rub, leaving your appliances feeling fresh and clean.

2. If concerned about cleaning tablet residue, indulge in a short 1-2 minute thermal rejuvenation cycle by soaking the deep-rejuvenated part in boiling/hot water. This step further refreshes your appliances.

3. Before wearing, rinse the appliances in cold water to ensure optimal comfort cleanliness.

Note: Do NOT brush under HOT tap water, which might cause damage to the appliance.

Treating a 4D Aligner™ with hot water is a unique feature of 4D Aligner™ System solution that results in shape-restoration of the 4D Aligner™ to its original shape.

Frequently Asked Questions (FAQs)

01 What is the LuxCreo 4D Aligner System?

The LuxCreo 4D Aligner System is an advanced chairside solution designed to manage orthodontic treatment cases quickly and efficiently. It leverages LuxCreo's cutting-edge direct printing technology to produce high-precision aligners with minimal need for attachments.

02 What are the key benefits of using the LuxCreo 4D Aligner System?

• Rapid Turnaround Time: Aligners can be produced and delivered within 2-3 days.

• Fewer Attachments: Enhanced accuracy and multi-thickness design reduce the need for additional attachments.

• Cost-Effective: Offers a more affordable solution for both orthodontic practices and patients, improving patient conversion rates.

03 How does the direct printing technology improve aligner fit?

Unlike the traditional thermoforming process, our printing technology enables the production of direct print aligners without the need for complex heat-up and pressure squeeze processes, which can lead to deviations in accuracy. By directly designing and printing the shell, these aligners fit precisely around the teeth, ensuring the correct application of forces for effective tooth movement. This precision reduces the necessity for attachments and provides better control over tooth alignment.

04 What is the multi-thickness design, and how does it benefit treatment?

The multi-thickness design allows for targeted force application, enabling precise control over tooth movements. This design is particularly beneficial in minor corrections cases where specific teeth need minor corrections.

05 What are the main advantages of LuxCreo's aligner system over competitors like Invisalign and Spark?

• Higher conversion rate due to fast turnaround time and cost-effectiveness.

• Chairside ease of use and broader capability for treating easy cases with less chair time.

06 How can I get more information about the LuxCreo 4D Aligner System?

For more detailed information, you can refer to the product brochure, sales sheets, or contact LuxCreo's customer support for specific queries. Email support@luxcreo.com or visit support.luxcreo.com

07 What treatment plan is this 4D Aligner system using?

You can design your treatment plan using your existing treatment plan software. Just follow our 4D Aligner Design Guidance. Or you can outsource our treatment planning service, contact support@luxcreo.com for more information.

08 Do you have any recommendations or guidelines for attachment sizes or wear time?

These are suggested guidelines based on our experience and research. We trust and rely on the expertise of our doctors to continuously improve, so we will accommodate your submissions.

09 Will I (doctor) be designing the aligners shells myself?

Yes, if you purchase iLux Pro Dental Solution, you will receive LuxCreo's design software-LuxDesign to customize your aligners shells by simple but reliable ''1-click'' generation.

Or you can start from 4D-20S. In that case, the LuxCreo team will be designing the aligners based on the preferences you indicate on our Print Request forms.

Ordering Information

4D Aligner™ Promotion 4D20
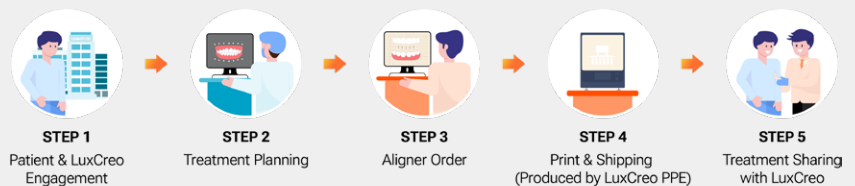
• **Minor Correction Aligner Cases - 20 stages or less**

4D20 Service Clear Aligner Production[1]	
4D20S	**$ 1,750.00/Case**
4D20 Partner Program Pricing[2]	
4D20S	**$ 1,250.00/Case**
4D20FLEX	**$ 799.00/Case**
4D Aligner Packaging 10 foil bags, 1 aligner container, 1 paper box, 2 chewies, 1 removal hook, 1 care guide	**$ 19.00/pack**
4D Clean Kit	**$ 99.00/kit**

[1] 4D20 Full-Service - full case is produced by LuxCreo or LuxCreo Production Partner Ecosystem (PPE).
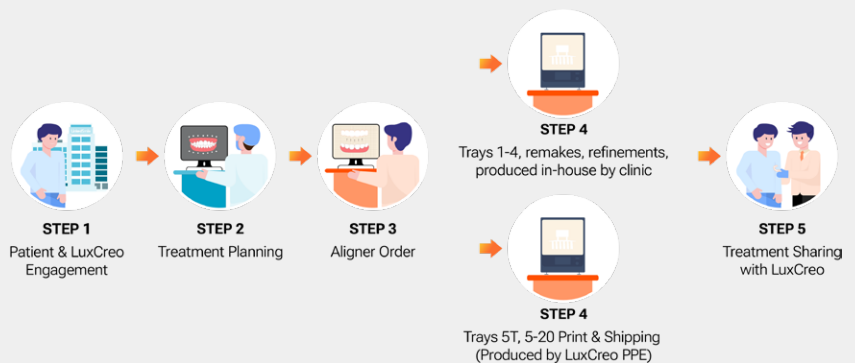
[2] iLux Pro Dental and fastprint.io solution customers are eligible to join the 4D20 Partner Program and receive 10 free case starts (1-4 In-House, 5-20 LuxCreo PPE in 1 Delivery) and discounted pricing.

$22/aligner for additional aligners produced by LuxCreo or 4D Aligner™ Production Partners.

• **4D-20S**
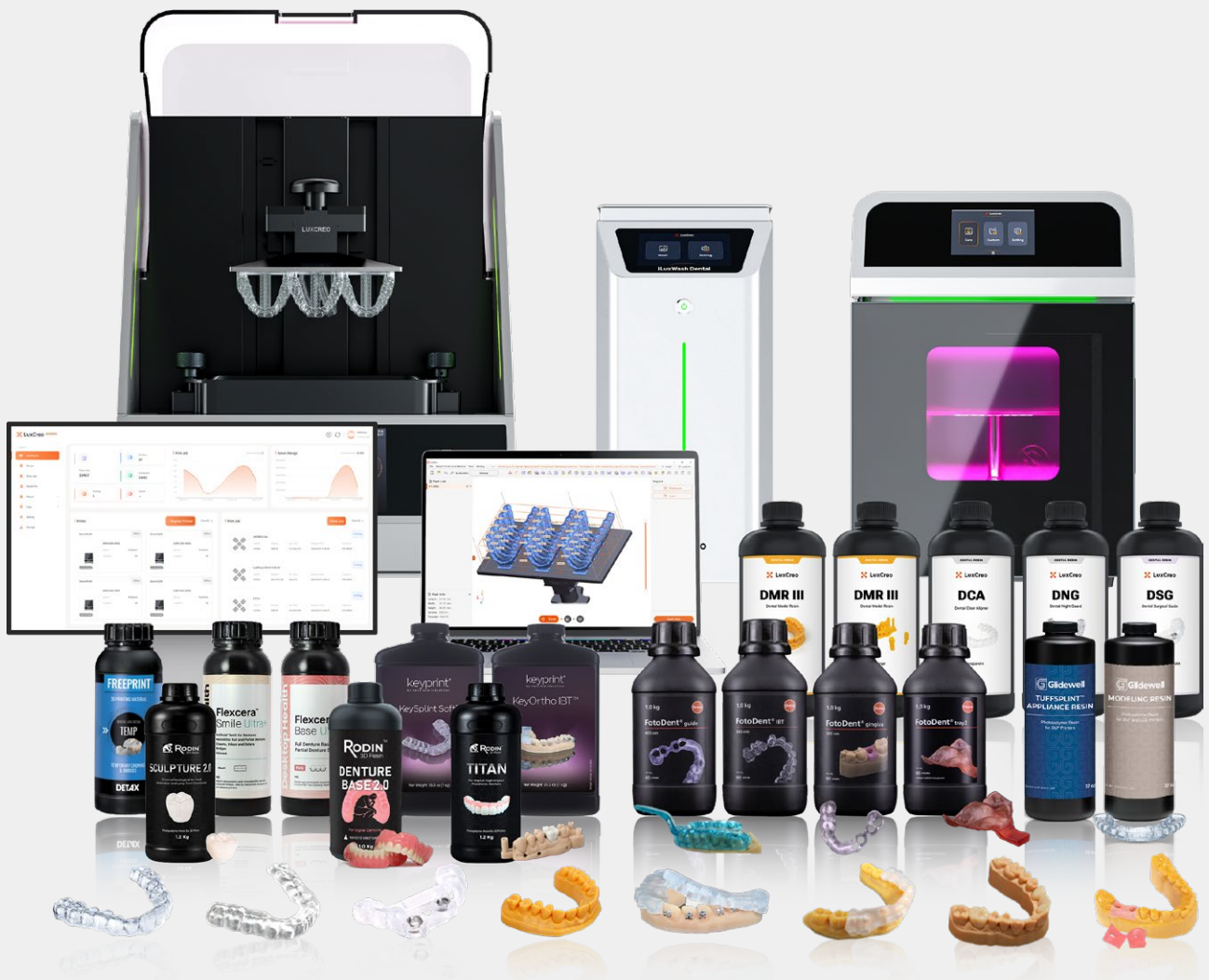**"Enjoy End to End**
Service from LuxCreo!"

STEP 1 Patient & LuxCreo Engagement
STEP 2 Treatment Planning
STEP 3 Aligner Order
STEP 4 Print & Shipping (Produced by LuxCreo PPE)
STEP 5 Treatment Sharing with LuxCreo

• **4D-20FLEX**
"Same-day Starts and
We Do the Rest!"

STEP 1 Patient & LuxCreo Engagement
STEP 2 Treatment Planning
STEP 3 Aligner Order
STEP 4 Trays 1-4, remakes, refinements, produced in-house by clinic
STEP 4 Trays 5T, 5-20 Print & Shipping (Produced by LuxCreo PPE)
STEP 5 Treatment Sharing with LuxCreo

iLux Pro Dental 3D Printing Solution

Immediate ROI with 10 Free 4D-20S Cases!

For iLux Pro Dental & fastprint.io Customers