

汽车内外饰表面激光科技

Auto Int&Ext Surface Laser Technology

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Reporter: Allen

个人介绍:

徐涌，字逸人，号太白逸人。

职业介绍:

14年汽车及产品外观纹理开发经验；

善于从造型、情感化设计、纹理趋势的角度，来解析纹理对提升产品设计和造型感知质量的重要性；

同济大学、上海交大、江苏大学、中南大学等高校客座讲师。



**有没有一种工艺，让塑料变得不像塑料，让塑料变得高级，
并且是低成本，可复制，可以大规模量产的？
达成降本增效！**

**Is there a kind of automobile interior and exterior decoration technology, Make plastic doesn't look like plastic, Make plastic more elegant ?
And low cost, replicable, mass production?
Reduce cost and increase revenue.**

激光碳纤维、拉丝纹理大量运用，提升品质感和科技感
Laser carbon fiber and hairline texture are widely used to enhance the sense of perceived quality and technology.

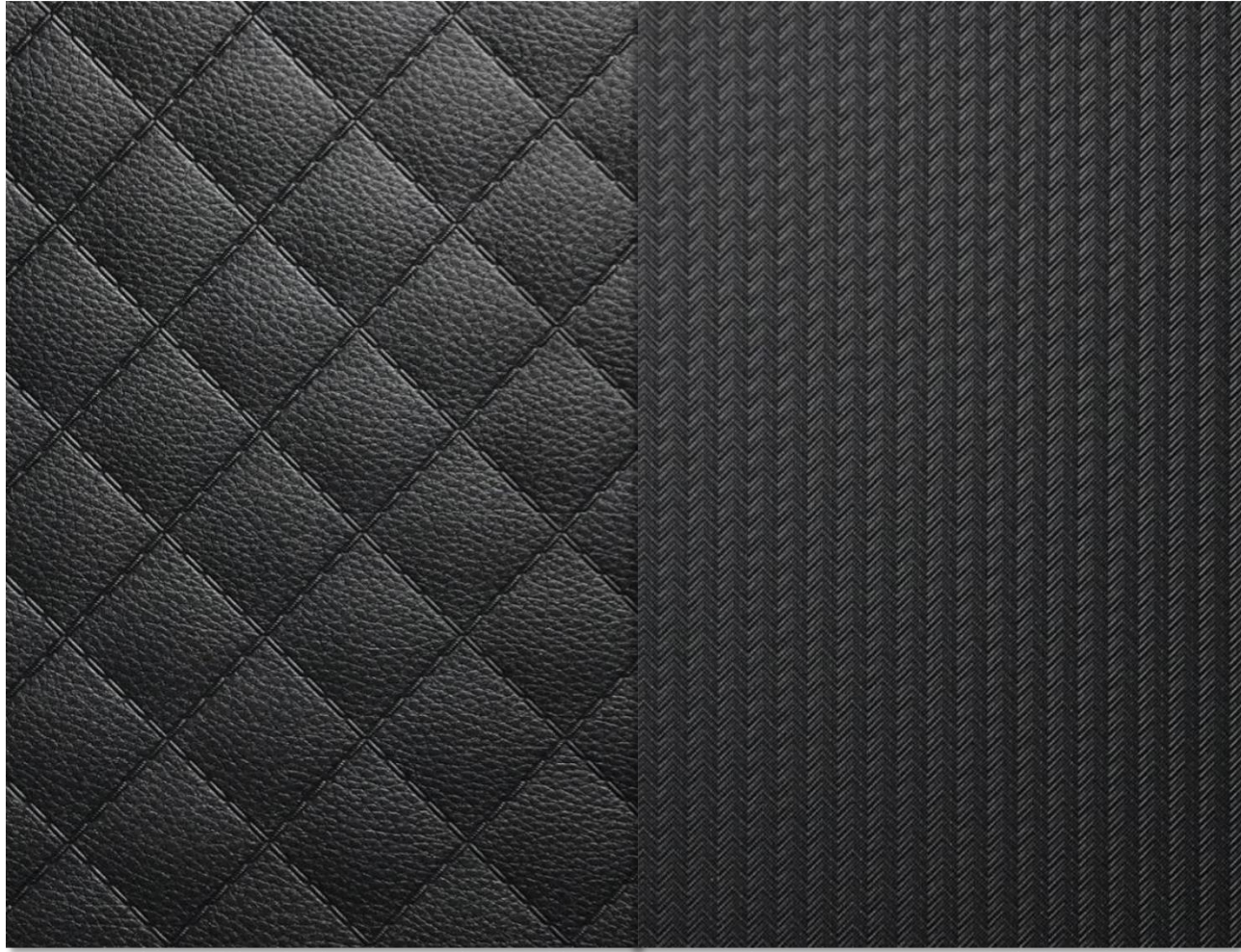


激光碳纤维、钻石纹、拉丝纹理大量运用，提升运动感与科技感
Laser carbon fiber, diamond cutting and drawing texture are widely used
to enhance the sense of motion and technology.



激光真皮、缝线、混纺编织纹理的运用，提升软触和品质感

Application of laser weave texture of leather, suture, blended knitting, improve soft touch and quality



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PART 01

天至尊及全球激光纹理联盟简介

Brief Introduction of TZZ and Global Laser
Group(GLG)

公司简介

Company Brief Profile



天至尊激光3D纹理公司，是全球最专业的汽车内外饰和电子产品外观纹理研发、设计、3D激光加工的现代化高科技纹理企业之一。
Suzhou TZZ is one of the most professional high-tech companies in automobile interior & exterior texture and electronics appearance texture engraving, which specializes in texture research, design and laser 3D machining.

3D激光雕刻展示了一个工艺的创新和成功，同时标志着TZZ迈向了全球现代化纹理的新时代。
3D Laser skills demonstrate the innovative drive and the success of a new technology and also have marked TZZ's path toward modern worldwide surfacing of new area.



Design Center



设计中心

Modernized Industry 4.0 TZZ- GF Laser Automatic Processing Plant



现代化工业4.0 天至尊-GF激光自动化加工工厂

德国KRUETH镍模表面处理中国技术中心 Krueth Nickel Shell Surface Treatment (China)Technology Center



现代化工业与传统技术并存
Coexistence of modern industry and traditional technology

Traditional Etching Technology Plant



传统技术蚀刻工厂

企业优势

Company Advantage



优势一 No. 1

引进最先进的设备，23台激光设备

五轴联动激光雕刻设备

4米激光加工机台，加工行程达到4米

最细激光源加工精度达到20μm

对于纹理品质进行数字化控制

避免模具的拼接轨迹，具备稳定一流的品质。

Most advanced equipment, 23 sets of Swiss GF laser solution.

5-axis laser machining.

The longest machining length is 4m.

The smallest laser accuracy is 20μm.

Digital and automation control.

Best stable quality without any matching line.



优势二 No.2

成立纹理设计研发中心

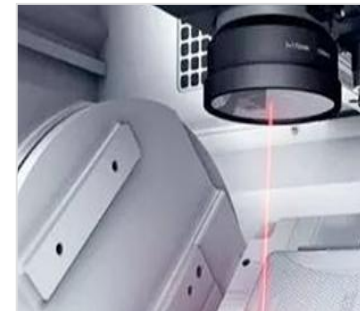
提供量身定制的个性化的独一无二的，

具有品牌价值的专属纹理设计

Set up the Texture Design R&D

center. Create exclusive and own

brand textures.



优势三 No.3

全球化领先的工艺

3D激光雕刻技术

3D激光雕刻+蚀刻相结合技术

高速转印蚀刻技术

满足汽车行业对内饰生产工艺更新迭代的要求。

The most advanced technology in global area of

3D-Laser Engraving,

Laser Engraving & Etching,

Fast Transfer Etching.

Meet auto interior market rapidly changing requirements.

企业奖项 Corporate Awards

2020年国际CMF设计奖—纹理公司唯一获奖单位
International CMF Design Award of 2019 - The Only Winner of Texture Company.

2020年中国模具工业协会 重点骨干企业——纹理公司唯一获奖单位
Key Backbone Enterprise of China Mould Industry Association of 2020 — The Only Winner of Texture Company.

2019年国际CMF设计奖 至尊金奖—纹理公司唯一获奖单位
Golden Medal of International CMF Design Award of 2019 - The Only Winner of Texture Company.

2018年中国模具工业协会 重点骨干企业—纹理公司唯一获奖单位
Key Backbone Enterprise of China Mould Industry Association of 2018- The Only Winner of Texture Company.



激光设备量产能力

Laser Graining Capability



激光设备产能（全球最多）：
Laser Capability(The most worldwide):

23台瑞士GF五轴激光雕刻机设备。
23 sets of Swiss GF 5 axis laser machines.

P4000U, 4米加工行程: 9台
P4000U, machining length 4m: 9 sets.

P1200U, 1.2米加工行程:4台
P1200U, machining length 1.2m:4 sets.

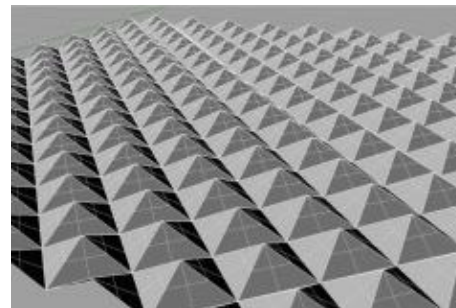
P1000U, 1米加工行程: 6台
P1000U, machining length 1m:6 sets.

P600U, 0.6米加工行程: 4台
P600U, machining length 0.6m:4 sets.



一、设计精细纹理，提升品牌价值

Customize design textures to specifically enhance brand value.

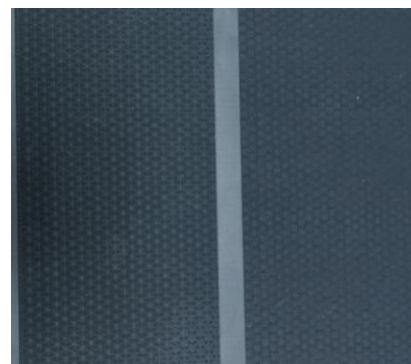


二、前期三维效果图制作

3D renderings making

三、快速打样RTP

Rapid texturing prototype

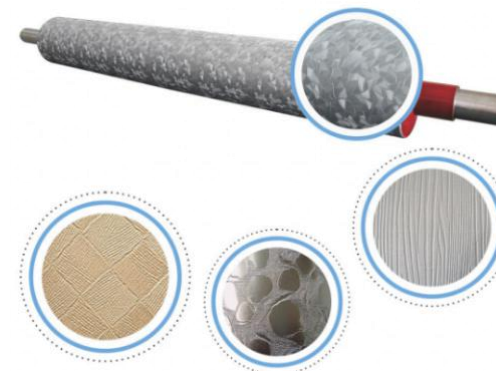


四、整车包覆技术

Complete vehicle wrapping technology

五、滚筒表皮开发

Embossing Roller for car leather



铝件镭雕流程
Laser Engraving Process for Aluminum Parts



副仪表板快速样件 -- 铝件
Console RP--aluminum parts



3D激光雕刻加工
Laser engraving



激光纹理雕刻铝模后样车效果
Laser engraving RP texture and installed in show car

数字雕刻技术的全球团队
TZZ global cooperation network
Global team of digital engraving technology



CustomEtch 美国
CustomEtch USA



Kruth 德国
Kruth Germany



天至尊 中国
TZZ China

天至尊——全球性目标
TZZ——Worldwide mission

联盟企业纹理共享-全球范围内使用相同的加工参数。

One grain-passport for all partner companies, indetically parameters far all locations、 world wide.

完美的地域优势-纹理研发+设计在全球完成。

Perfect performance locally ,grain-development +texture-mappings finalized by all partners.

全球加工一致性-相同的模具，相同的加工参数。

Global performance identically,identical texture-mapping by identical molds.

全球生产需求
Demands of an global production

纹理研发与设计共同完成
Grain_development+texture-mapping
made+designed by Kruth、 CustomEtch and TZZ

纹理技术与纹理品质全球一致性
Grain-technology+Grain-quality worldwide
made indetically



全球性的技术转移
Globale technology-transfer

我们的世界性语言：信息交换
our worldwide language:exchange of information

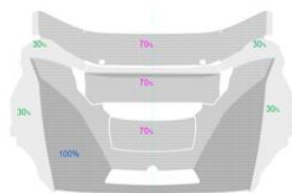
- 纹理+ 数字加工信息完全传递
Grain+Processinformation pass totally
- 持续明确的工艺流程
Continuoues defined process-flow
- 考虑条件+ 公司结构
In consideration of condition+company structure
- 跨越语言障碍：视频会议+ 图片信息
Crossing language barrieres:
videoconference+information by picture
- 定期项目会议/监控+ 现场的支持
Regularly projectmeetings/monitoring+surport
on-site

PART 02

纹理工艺的革命和激光3D纹理独特性

Revolution of Texture Technology and
Uniqueness of Laser 3D Texture

革命 Revolution



•模具保护



•制版



•印纹



•化学腐蚀



•清洗

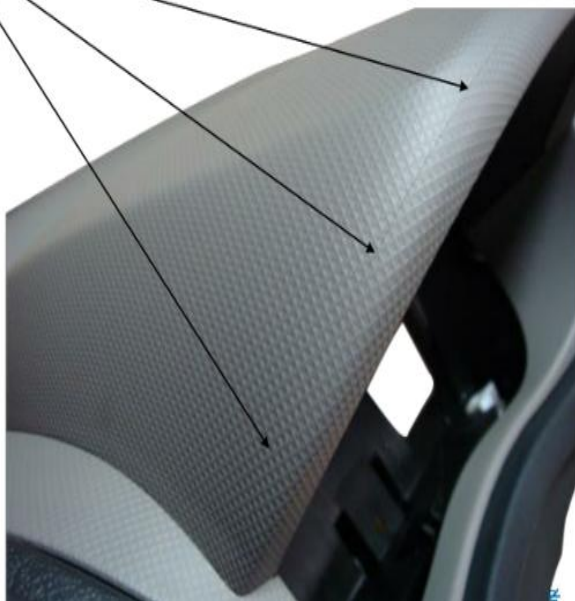
•流程

流程

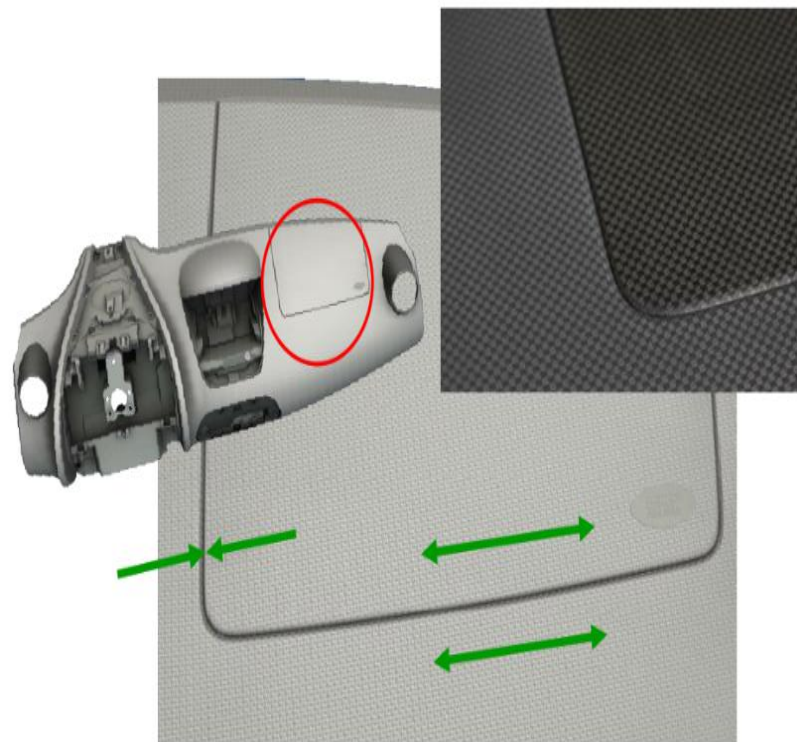
蚀刻VS激光

Etching VS Laser Texturing

- Split line
- 接缝



Split line
会产生拼接印



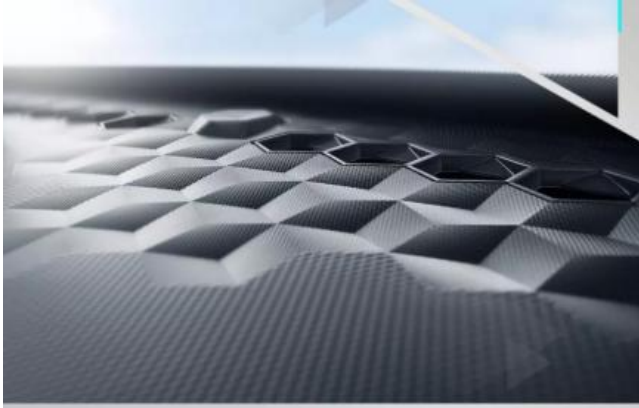
Incoherent texture
纹理不够连贯

传统化学蚀刻与激光雕刻工艺的对比

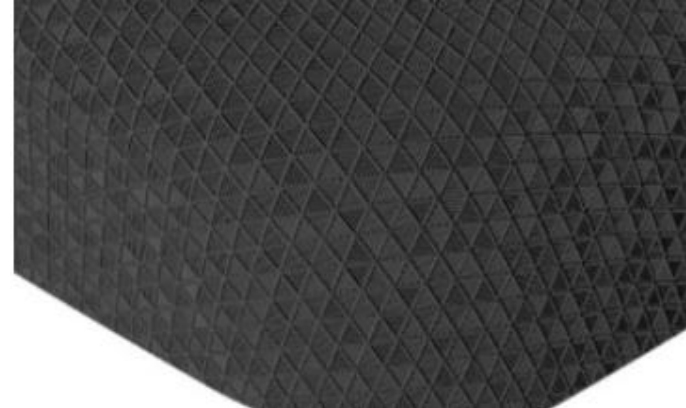
Comparison between Traditional Etching and Laser Engraving

激光雕刻
软件排图+激光雕刻

Laser Engraving
Software mapping
+ Laser engraving



激光雕刻3D几何纹理，呈现出很强立体感的视觉效果
Laser engraving 3D geometric texture presents strong stereoscopic visual effect.

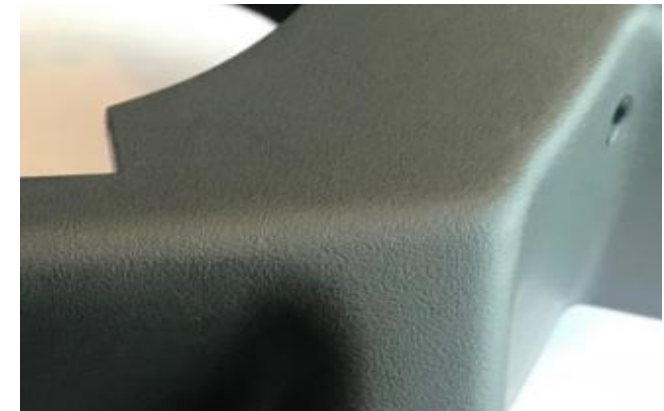
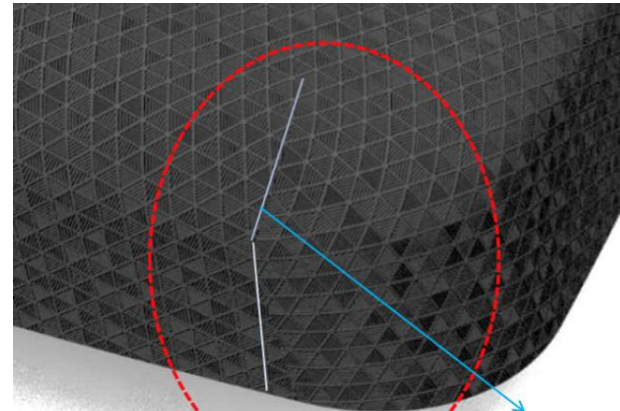


蚀刻纹理会产生拼接印，纹理不够连贯，而激光3D纹理，过渡更自然
Traditional etching may produce connection mark, and incoherent texture, but 3D laser texture can splice more naturally.



激光雕刻3D纹理，是在自由曲面表面，具有无限设计加工可能性
Laser engraving 3D texture can be on free-form surface, with infinite design and machining possibility.

传统蚀刻
手工贴菲林+药水腐蚀
Traditional Etching
Hand-pasted Film
+ Medical Etching

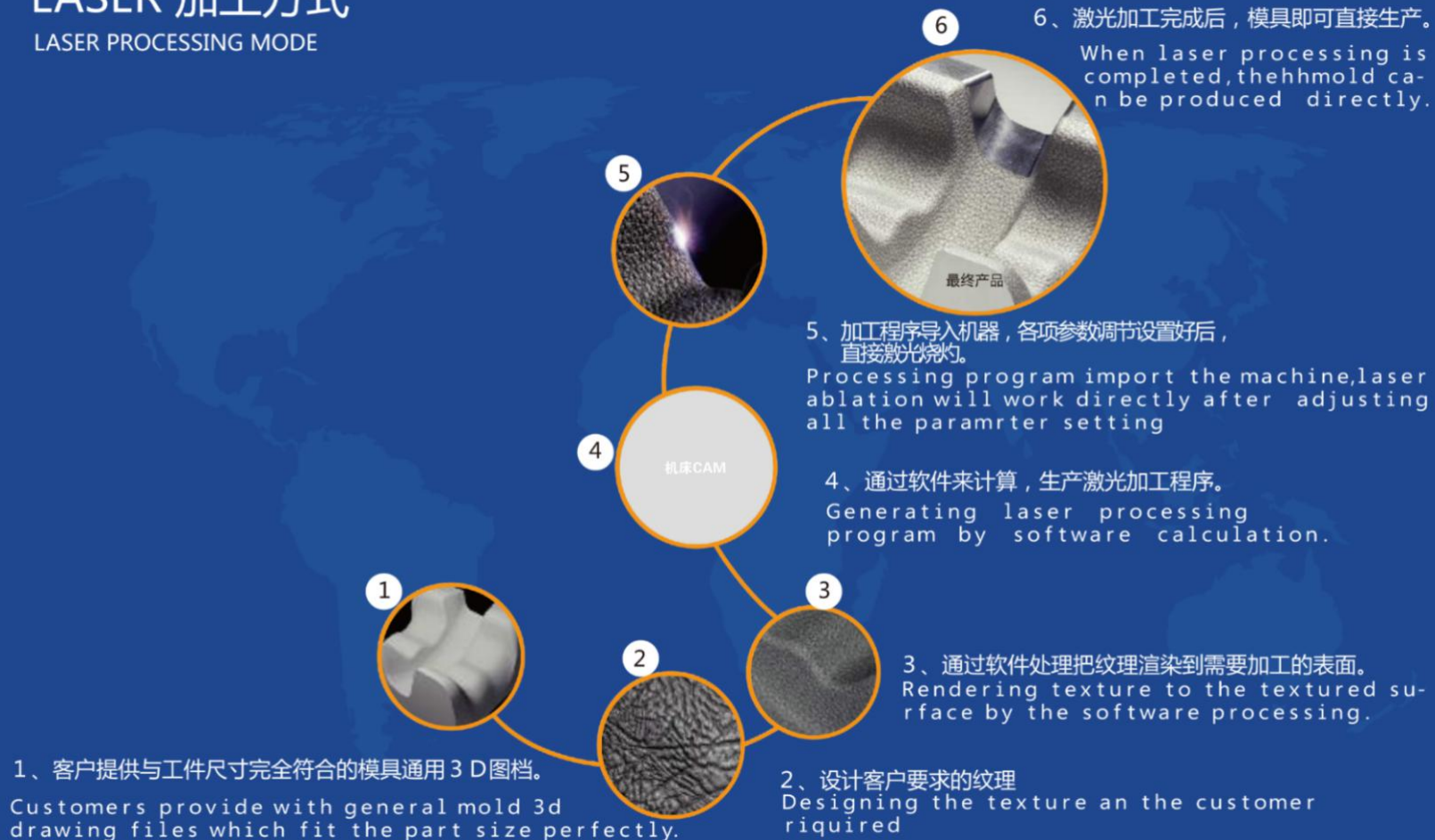


参数化设计与数字化加工无缝对接，完美呈现纹理效果

Parametric design and digital processing seamlessly dock, perfectly presenting texture effect

LASER 加工方式

LASER PROCESSING MODE



激光纹理优势

Laser Texture Advantages



表面纹理视觉触感更加逼真，体现活力、科技、品质、运动、时尚、未来、金属等。

Surface texture visual touch is more realistic, reflecting vitality, science and technology, quality, sports, fashion, future, metal and so on.



无限的设计自由
Infinite Design Freedom



提升质感去塑化
Improving texture and removing plastics



提高品牌可视性
Improving Brand Visibility



高度自动化
Highly automated

优势五

环保工艺，无化学品使用
Environment friendly

优势四

无视钢材性，可以加工各种金属
Engraving all kinds of metals.

优势三

全数字化，可复制性与一致性强
Fully digital, reproducible and consistent.

优势二

自由曲面的表面，无限设计加工可能性
Free Surface, Infinite Design and Machining Possibility.

优势一

侧边花纹深度精准到 $1\mu\text{m}$ 左右，减花效果更完美，深度更准确，更均匀，模具拉花几率大大降低
The accuracy of side texture is about $1\mu\text{m}$, the effect of reducing pattern is more perfect, the depth is more accurate and evenly, and the probability of mould scratch are greatly reduced.

激光皮纹&腐蚀皮纹&贴膜片&喷漆 单车成本对比

Laser Grain&Etching&INS&Painting CPV Comparison



- 前门饰条（一侧）：

 - 450*67*38mm
 - PC/ABS
 - 0.019m²
 - 64g
- 后门饰条（一侧）：

 - 674*83*38mm
 - PC/ABS
 - 0.027m²
 - 81g

No.	工艺类型 Process Type	预估单车成本 Estimated CPV	预估投资费 Estimated B-Invest	激光皮纹取代其它工艺 降低投资费 Estimated B-Invest Laser Texture Replace Other Technique
1	激光皮纹 Laser Texture	0.30 RMB	15万元 150,000 RMB	-
2	腐蚀皮纹 Chemical Etching	0.08 RMB	4万元 40,000 RMB	增加11万元↑ +110,000 RMB↑
3	IMD&INS Patch Film	200 RMB	1亿元 100,000,000 RMB	减少9985万元↓ -99,850,000 RMB↓
4	喷漆 Painting	50 RMB	2500万元 25,000,000 RMB	减少2485万元↓ -24,850,000 RMB↓

预估计算：
单车4个门饰条，
10年量产周期合计50万台车。
价格只是预估，不作为实际报价，仅作为
不同工艺的成本比较分析。

Budget Estimates:
Four door decorative strip.
10-year production cycle totals
500,000 vehicles.
The price is only as estimate, not as
actual quotation, just as comparative
analysis of the costs of different
techniques.

Etching < Laser Texturing < Painting < Electroplate < IMD&IML&INS < TOM

Laser Texture ≈ 1/1000 INS Patch Film

PART 03

树立品牌辨识度，提升感官质量

Create Brand Recognition and Improve
Perceived Quality

情绪化设计，通过独具匠心的纹理设计，改善给人的感受和氛围

Emotional design, change the feeling and atmosphere to people by texture decoration.

豪华、大气
luxurious, Splendid



简约、时尚
Simplicity, Fashion

办公室助手

你的地盘，你做主



舒适、居家
Comfortable, Livable



细腻、质感
Delicate, Exquisite



端庄、沉静
Calm, Quiet



科技、律动
Scientific, Rhythmic



从纹理和细节层面，树立品牌辨识度，实现视觉营销

Establishing Brand Identity from Texture and Detail. Realise Visual Marketing.



创造明亮舒适的内饰很有必要，大大提升了产品的纯净感、科技感。

汽车纹理不再浮于表面，可以是更有触觉感受的立体花纹。

各大主机厂根据品牌需要开发出自己专属独特的纹理样式，从细节层面就树立品牌辨识度。

It is necessary to create bright and comfortable interior, which greatly improves the purity and technology feeling of products.

Vehicle texture is no longer floating on the surface, it can be a more tactile three-dimensional pattern.

Major auto OEM develop their own unique texture style according to the needs of the brand, and establish brand recognition from the level of detail.

品质将越来越被重视，胜过造型感知力，创新与科技纹理的重要性与日俱增
Quality will be paid more and more attention than the perception of shape.
The Importance of Innovation and Texture of Science and Technology is increasing.



**科技纹理、渐变纹理，纹理与色彩面料的有机创新结合，
提升内饰精致感，层次感，显示设计的精妙和别具一格。**
Technological texture, gradient texture, texture and color fabrics are combined with organic innovation.
Enhance the delicacy of interior decoration, layering, showing the delicacy and distinctiveness of the design.

PART 04

3C家电汽车纹理发展趋势和应用案例

Texture Development Trends of 3C, Electric appliance and Auto, Application Cases



CMF TREND & EXPLORATION

2 0 2 2 - 2 0 2 3

HiPRO

&

TZZ+ 天至腾科技
TZZ+TECH

CMF TREND & EXPLORATION

2 0 2 2 - 2 0 2 3

THEME 01
硬核自然
UNCOMPROMISING
NATURE

THEME 02
柔核自然
ADAPTABLE
NATURE

THEME 03
木本自然
WOODEN
NATURE

THEME 04
光感自然
RAY OF LIGHT

THEME 05
年度自然
COLOR OF THE
YEAR

HiPRO

&



THEME 01 硬核自然
UNCOMPROMISING NATURE

01-1(TZZ-A163)
BLACK ROCK
黯峻岩

01-2(TZZ-A163)
GREEN MARBLE
海藻大理石

01-3
SPECKLED WORLD
斑点世界

01-4(TZZ-A168)
WHITE CONCRETE
混凝白岩

01-5(TZZ-A169)
LIGHT GRANITE
浅花灰岩

01-6(TZZ-A164)
DARK BASALT
玄武岩

THEME 02 柔核自然
ADAPTABLE NATURE

02-1(TZZ-A167)
FADED JEANS
褪色牛仔

02-2(TZZ-A167)
BUSY COWBOY
牛仔很忙

02-3(TZZ-A169)
VINTAGE CORDUROY
复古芯绒

02-5(TZZ-A166)
BROWN LINEN
灰棕亚麻

02-4(TZZ-A166)
UNBLEACHED LINEN
原色亚麻

02-6(TZZ-A170)
WARM SUNLIGHT
编织暖阳

THEME 03 木本自然
WODDEN NATURE

03-1(TZZ-A169)
CHESTNUT WOOD
栗条木

03-2(TZZ-A161)
LIGHT ASHTREE
浅柳木

03-3(TZZ-A160)
WARM WALNUT
暖胡桃

03-4(TZZ-A161)
DARK EBONY
深乌檀

03-5
BROWN CORK
软木棕

03-6(TZZ-A165)
MUDDY MUSHROOM
沃泥茸

THEME 04 光感自然
RAY OF LIGHT

04-1(TZZ-A170)
UNDERWATER SAND
水中砂

04-2(TZZ-A171)
SHADOW OF BAMBOO
幽篁影

04-3(TZZ-A170)
RAINBOW FEATHER
彩斓羽

04-4(TZZ-A169)
TRANSPARENT GREEN
透窗绿

04-5
SILKY DARK SILVER
冷光黯银

04-6
ROUGH DARK SILVER
冷雾黯银

THEME 05 年度自然
COLOR OF THE YEAR

HiPRO & TZZ+ 天至尊科技
TZZ·TECH

05-1(TZZ-A171)
EXTENDING NIGHT
浩淼夜

05-2
TINY SPLENDOR
溢星辉

05-3
BLUEBERRY SMOOTHIE
蓝莓慕雪

05-4
FOGGY RAIN
冷雨雾

05-5
MISTY PURPLE
缈雾紫

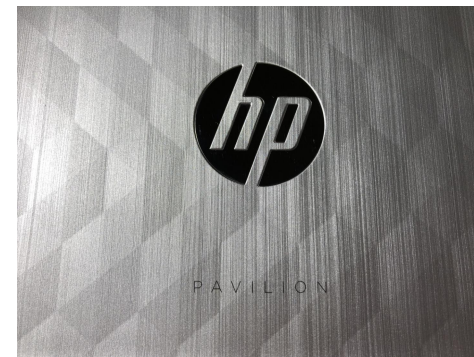
05-6
MOONLIGHT OCEAN
胧月海



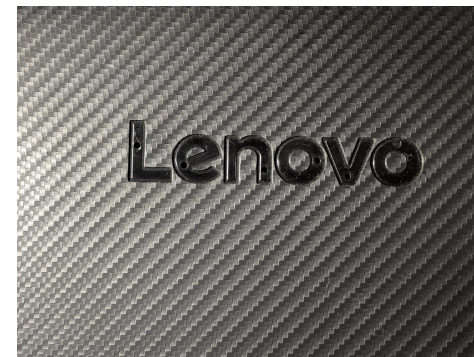
笔电外观
Laptop appearance



拉丝纹理
Wiredrawing grain



立体几何拉丝复合纹理
Solid geometry drawing
composite texture



碳纤维纹理
Carbon fiber texture



手机外观纹理
Phone appearance texture



真皮质感+缝线质感
Genuine leather texture+Sewing texture



幻影纹理
Phantom texture



冰裂纹理
Ice crack texture



磨砂纹理
Frosted texture



路由器外观纹理
Router appearance texture



充电宝外观纹理
Charging treasure
appearance texture



头戴外观纹理
Texture of head wear
appearance



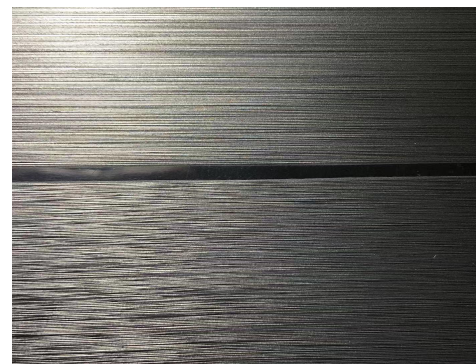
手环外观纹理
Texture of bracelet appearance



眼镜架外观纹理
Texture of frame appearance



TV外观
TV appearance



拉丝纹理
Wiredrawing grain



显示器后壳
Back cover



主机箱外观
Chassis appearance

客户案例展示-奥迪Q3 尾灯 Customer Projects Display-Audi Q3 - Tail light

激光纹理--若隐若现的尾灯双重视觉效果
Laser Grain-Double visual effects of AUDI LOGO



客户案例展示-一汽大众BC316 方向盘+安全气囊盖 Customer Projects Display - FAW-VW BC316 Airbag

激光纹理--高度逼真的真皮纹
Laser Grain-Highly Realistic Leather Grain



客户案例展示-广汽埃安LX 后视镜 Customer Projects Display - GAC AION LX Back View Mirror

激光纹理--真假难辨的碳纤维纹理
Laser Grain- Seems Real Carbon Fiber Texture

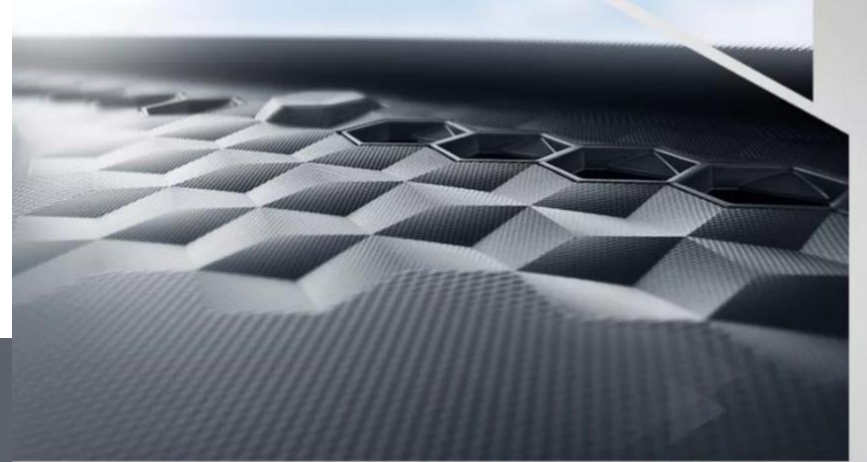


客户案例展示-吉利 几何A 整车内外饰

Customer Projects Display GEELY Geometry A - Whole Auto Interior and Exterior

激光纹理--渐变科技纹理+多维科技纹理

Laser Grain- Gradually Change Texture + Multi-Dimension Texture



客户案例展示-吉利 几何A 整车内外饰

Customer Projects Display GEELY Geometry A - Whole Auto Interior and Exterior



2019
国际CMF设计奖
金奖

2019
国际CMF设计奖-至尊金奖
2019 INTERNATIONAL CMF DESIGN AWARD-SUPREME GOLD AWARD



产品名 PRODUCT NAME

吉利几何A车型 整车内外饰 几何科技纹理 激光镭雕工艺
GEELY GEOMETRY A, WHOLE INTERIOR AND EXTERIOR,
GEOMETRY TECHNOLOGY TEXTURE, LASER ENGRAVING CRAFTSMANSHIP

品牌商 BRAND OWNER

吉利汽车造型中心
GEELY DESIGN
中国：上海
SHANGHAI, CHINA

工艺提供商 CRAFTSMANSHIP PROVIDER

苏州天至尊纹理科技
SUZHOU TZZ TEXTURE TECH
中国：苏州
SUZHOU, CHINA

设计 DESIGN

周枫
ZHOU FENG

设计 DESIGN

薛鹏
ROCK XUE

2019年10月22日
OCTOBER 22, 2019

国际CMF设计奖评委代表
INTERNATIONAL CMF DESIGN AWARD JURY REPRESENTATIVE

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EUI SOO, CMF EXPERT

国际CMF设计奖组委会
INTERNATIONAL CMF DESIGN AWARD ORGANIZING COMMITTEE

客户案例展示-吉利ICON 整车内外饰

Customer Projects Display Geely ICON - Whole Auto Interior and Exterior

激光纹理--双色双料软触材料+几何科技纹理+栩栩如生的双缝线和真皮纹理+结合内饰氛围灯，营造舒适感、未来感和科幻感
Laser Grain-- Double color Double material soft touch material, Geometry Technology Texture, Lifelike double suture and Leathertexture, combined with interior atmosphere lamp, create a sense of comfortable, future and science fiction.



客户案例展示-吉利ICON 整车内外饰

Customer Projects Display Geely ICON - Whole Auto Interior and Exterior



2020
国际CMF设计奖

2020
国际CMF设计奖
2020 INTERNATIONAL CMF DESIGN AWARD



产品名 PRODUCT NAME

吉利 ICON车型 整车内外饰激光3D纹理浮雕+多种CMF工艺的有机融合
Geely-ICON Whole Interior and Exterior Laser 3D Texture
Engraving + Integrating Multiple CMF Solutions

品牌商 BRAND OWNER

吉利汽车造型中心
GEELY DESIGN
中国·上海
SHANGHAI, CHINA

工艺提供商 CRAFTSMANSHIP PROVIDER

苏州天至尊纹理科技
TZZ DESIGN
中国·苏州
SUZHOU, CHINA

设计 DESIGN

胡雅琪
Kiki Hu

设计 DESIGN

薛鹏
Rock

2020年11月23日
NOVEMBER 23, 2020

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PROFESSOR

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INTERNATIONAL CMF DESIGN AWARD ORGANIZING COMMITTEE

纹理设计开发是细分领域，纹理费用占产品研发支出微小的比例，

但是对产品设计感知质量的提升，影响极其重要！

可以极大提升产品感知质量，让产品看起来更高级，更精致，更赏心悦目！

Texture design and development is a subdivision field, and texture cost accounts for a small proportion of products' R&D expenditure.

But it is very important to improve the perception quality of the whole product!

It can improve the perception quality of the products, make the products seems much more elegant and sophisticated, gladden the heart and please the eyes.

CMF之歌 作者：徐逸人

色彩材质和纹理，
相辅相成不分离。
不拘一格焕新颜，
方能精美又绝伦。

**天至尊纹理科技**GLOBAL
LASER
GROUP
天至尊科技

徐 涌
副 总

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GROUP

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