



**ResearchInChina**  
[www.researchinchina.com](http://www.researchinchina.com)

# Automotive Smart Surface Research Report, 2023

Nov. 2023

## Market status: vehicle models with smart surfaces boom in 2023

From 2018 to 2023, there were an increasing number of models equipped with smart surfaces, up to 52,000 units in 2022 and 256,000 units from January to September 2023, and main models were Haval H6, Deepal SL03, and Neta S. Among them, Deepal SL03 uses smart surfaces in ambient lighting with translucent leather; Neta S packs multifunctional steering wheel where "scroll wheel + virtual buttons" is used to complete relevant operations.

### Neta S Steering Wheel with Floating Multifunctional Button Area Design

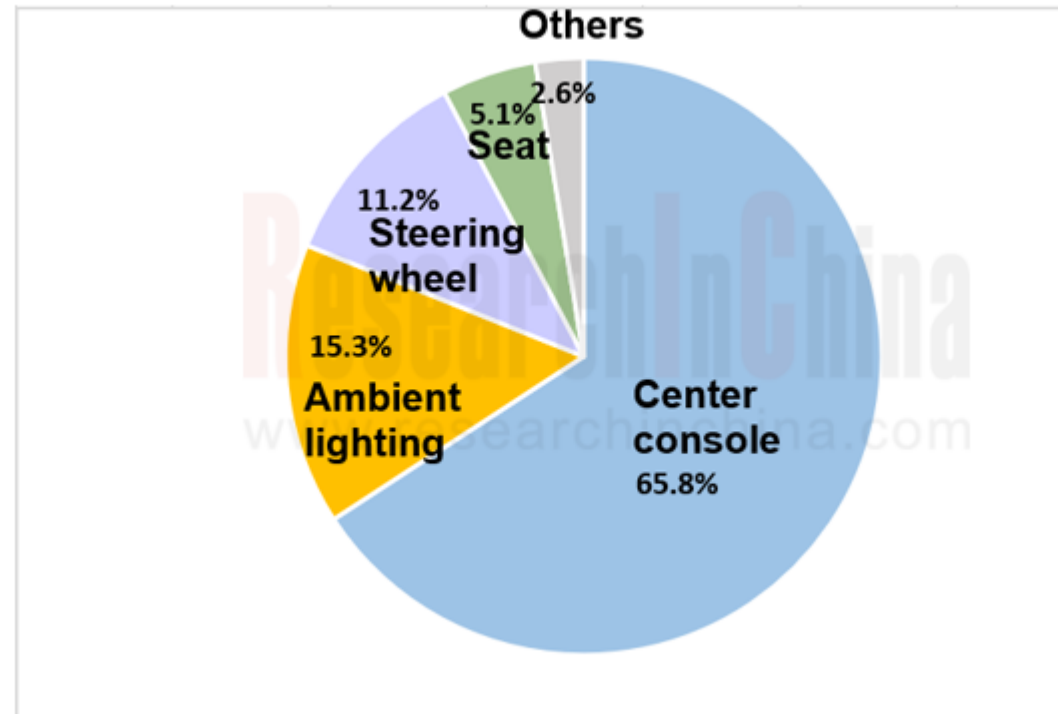


Source: Hozon Auto

# Installation Positions of Smart Surfaces in Main Models

Smart surfaces can be installed on center console, ambient lighting, steering wheel, doors, seats and other parts of a vehicle. From January to September 2023, body parts equipped with smart surfaces were mainly center console, steering wheel and ambient lighting.

Installation Positions of Smart Surfaces in Main Models, Jan.-Sept. 2023



Source: ResearchInChina

# Chinese suppliers start late, but have market and cost advantages

## Suppliers: Chinese suppliers start late, but have market and cost advantages

On the whole, there is a large technical gap between Chinese smart surface suppliers and their foreign peers. Yet the Chinese market has a low-cost ecological industry chain, helping domestic suppliers to adopt more flexible market schemes.

- **Foreign suppliers** (leading Tier1s, e.g., Continental and Antolin) can directly meet the requirements of OEMs (e.g., BMW), and use their R&D strength to help OEMs with requirement verification.

\* **Chinese smart surface suppliers** develop slowly. From 2022 to 2023, more listed companies joined the smart surface industry chain.

As smart surface technology advances in China, Chinese suppliers need to combine software and systems to overall deploy smart surfaces, and rid themselves of a business service model of simply processing or providing hardware.

Smart Surface Technology of Some Listed Companies in China

Supplier	Time	Smart Surface Technology	R&D Progress
HAXC Holdings	Dec. 2022	Suspended display smart surface technology	Started
Ningbo Huaxiang Electronic	Jan. 2023	Pre-research of smart surface products based on capacitive film and PCBA hardware technology	Completed definition of smart surface products and functions (capacitive touch, vibration feedback, pressure sensing, flowing water ambient light, etc.), product solution design, A sample production, and DV test verification
Daming Electronics	2023H1	Smart surface technology	Applied to center console surface, and trial-produced in small volume

Source: ResearchInChina

In July 2023, Marelli introduced the new Miragic, a display for cars that disappears when not in use. Featuring Marelli's innovative Shy-Tech solution, this disappearing display seamlessly integrates in OEMs' cockpit style, blending discreetly with various materials and surfaces. It provides equal or better visibility than conventional displays, enhancing safety by limiting distractions for the driver.

Moreover, Marelli Miragic simplifies parts integration and assembly operations, greatly reducing weight of related body components.

## Marelli Miragic Display



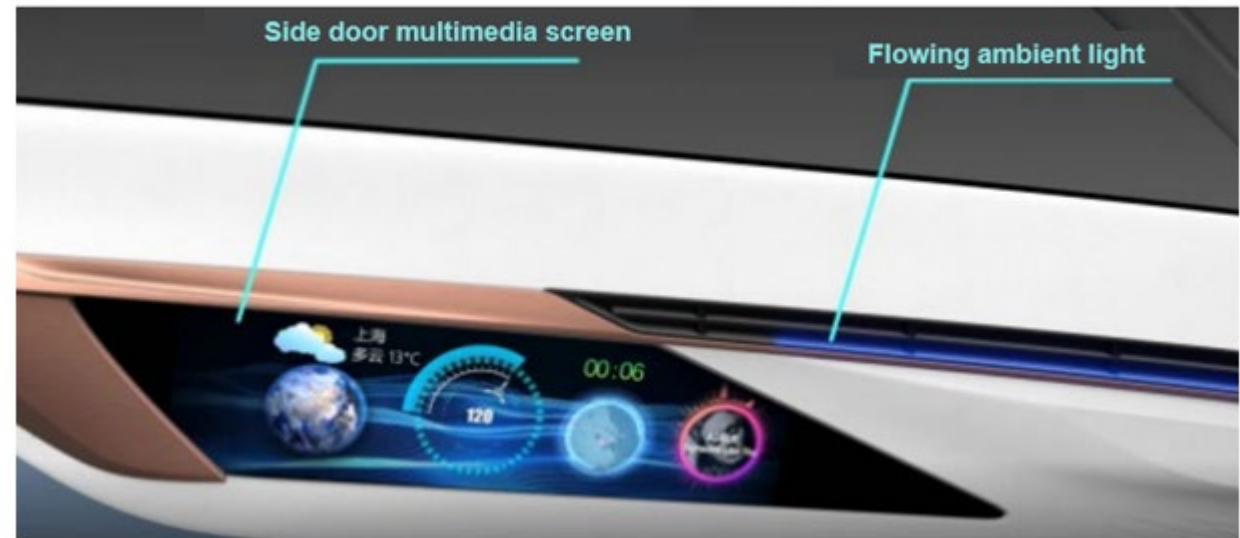
Source: Marelli

# Ningbo Huaxiang Electronic develops new smart surface materials and technologies

Ningbo Huaxiang Electronic develops new smart surface materials and technologies using multimodal interaction technology, fusing perception data in "vision", "voice" and other modes, and combining them with automotive electronics and optoelectronics technologies. Huaxiang Electronic plans iteration of next-generation smart surface technology based on multimodal interaction, with the ultimate goal of evolving it into an intelligent vehicle assistant.

As of June 2023, Ningbo Huaxiang Electronic's smart surface products are still under development and have yet to be designated. In the first phase of R&D, its smart surface integrates such functions as smart touch, vibration feedback, and pressure sensing for preventing touch by mistake. Ningbo Huaxiang Electronic can design and customize surface materials as required, and enables personalized HMI hardware and software functions by integrating logo and ambient lights among others, and combining hidden touch buttons and translucent surfaces on trim strips, door panels and instrument panel.

## Smart Surface Products of Ningbo Huaxiang Electronic



Source: Ningbo Huaxiang Electronic

# Conventional OEMs are more willing to use smart surfaces

**OEM: conventional OEMs are more willing to use smart surfaces.**

From 2020 to 2023, conventional OEMs showed higher willingness to develop and accept smart surfaces and launched more vehicle models.

## Some Vehicle Models Equipped with Smart Surfaces

OEM	Model Equipped with Smart Surfaces	Installation Positions of Smart Surfaces
Mercedes-Benz	EQS	Sub-instrument panel, steering wheel
BMW	BMW 7 series	Center console, doors
	iX All-electric Edition	Sub-instrument panel, steering wheel
FAW	Hongqi E001	Steering wheel, center console
	H9	Steering wheel
SAIC	IM L7	Doors, center console, steering wheel
	Roewe Whale	Center console, steering wheel
	Buick Century	Seats (Yanfeng)
Deepal	Deepal SL03	Ambient light
ARCFOX	Kaola	Left doors, steering wheel
HiPhi	HiPhi X	B pillars

Source: ResearchInChina

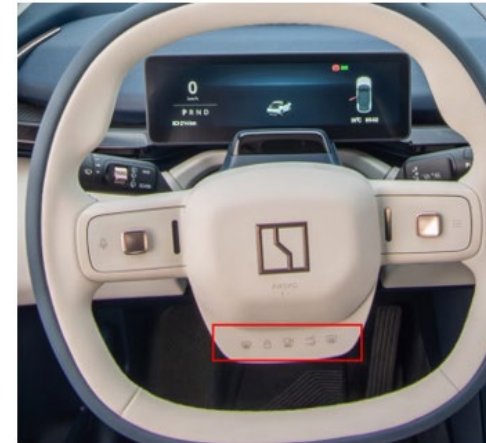
# Geely ZEEKR X and Hongqi E001

Geely ZEEKR X's steering wheel adopts a "touch buttons + physical buttons" joint operation mode where a touch panel installed under the steering wheel is used to control trunk, front glass heating and other functions.

**Launched in April 2023 and scheduled to go on sale in November, Hongqi E001 is equipped with smart surface functions:**

- Each touch function icon can be illuminated by touch to adjust functions of music, fragrance and air conditioning;
  - Smart surface operation buttons work on the capacitance principle. Inductive touch switch can penetrate insulating material shells to detect effective touch of fingers, with high sensitivity;
- \* The pressure sensing and vibration feedback functions allow users to sense without observing, which improves driving safety.

ZEEKR X's Steering Wheel



Source: Geely

Hongqi E001



Source: Hongqi



# Table of Content (1)

## 1 Overview of Automotive Smart Surface Industry

- 1.1 Definition of Automotive Smart Surface
- 1.2 Development History of Automotive Smart Surface
  - 1.2.1 Development History of Automotive Smart Surfaces: Phase 1
  - 1.2.2 Development History of Automotive Smart Surfaces: Phase 2
  - 1.2.3 Development History of Automotive Smart Surfaces: Phase 3
- 1.3 Brief Introduction to Automotive Smart Surface Technology
  - 1.3.1 Automotive Smart Surface Technology - IMD
  - 1.3.2 Automotive Smart Surface Technology - IME
  - 1.3.3 Automotive Smart Surface Technology - TOM
  - 1.3.4 Automotive Smart Surface Applications
- 1.4 Automotive Smart Surface Industry Chain
  - 1.4.1 Brief Introduction to Automotive Smart Surface Industry Chain
  - 1.4.2 Automotive Smart Surface - Major IME Suppliers
  - 1.4.3 IME Applications for Touch Control
  - 1.4.4 Different Types of Smart Surface Decorative Films
  - 1.4.5 Automotive Smart Surface Materials - Translucent Skin
  - 1.4.6 Automotive Smart Surface Materials - Smart Fabric
  - 1.4.7 Automotive Smart Surface Materials - Transparent Conductive Electrode
  - 1.4.8 Performance Comparison between Transparent Conductive Electrode Materials
  - 1.4.9 High Integrated Performance Materials
- 1.5 Automotive Smart Surface - IME Market Size 2020-2025E
- 1.6 Development Trend of Automotive Smart Surface
  - 1.6.1 Trend 1
  - ...
  - 1.6.8 Trend 8

## 2 Tier 1 Automobile Smart Surface Companies

- 2.1 FORVIA
  - 2.1.1 Profile
  - 2.1.2 Operation
  - 2.1.3 Layout in China
  - 2.1.4 Smart Surface
  - 2.1.5 FORVIA Intuitive System
- 2.2 Yanfeng
  - 2.2.1 Profile
  - 2.2.2 Business Layout
  - 2.2.3 Operation
  - 2.2.4 Smart Surface Technology
  - 2.2.5 Smart Surface Technology for Variable Functional Requirements
  - 2.2.6 Smart Surfaces for Center Console/Lighting Interiors
  - 2.2.7 Smart Surface Functions for XiM20-23 Series
- 2.3 Antolin
  - 2.3.1 Profile
  - 2.3.2 Development History
  - 2.3.3 Operation
  - 2.3.4 Smart Surface
  - 2.3.5 Dynamics
  - 2.3.6 In-Spire Intelligent Cockpit
- 2.4 Continental
  - 2.4.1 Profile
  - 2.4.2 Development History
  - 2.4.3 Operation
  - 2.4.4 Smart Surface Characteristics
  - 2.4.5 Smart Surface Structure
  - 2.4.6 Cockpit Smart Surface
- 2.5 Minth Group

# Table of Content (2)

- 2.5.1 Profile
- 2.5.2 Development History
- 2.5.3 Operation
- 2.5.4 Product Application - 1
- 2.5.5 Product Application - 2

- 2.6 Marelli
- 2.6.1 Profile
- 2.6.2 Smart Surface (Interactive Translucent Decoration)
- 2.6.3 Smart Surface Center Console
- 2.6.4 Dynamics

- 2.7 CAIP
- 2.7.1 Profile
- 2.7.2 Intelligent Cockpit Interior

## **3 Core Enterprises of Automotive Smart Surface Supply Chain**

- 3.1 DuPont
- 3.1.1 Development History
- 3.1.2 Product Introduction
- 3.1.3 Smart Surface Business
- 3.1.4 Smart Surface Major Products
- 3.2 Tactotek
- 3.2.1 Profile
- 3.2.2 Main Products
- 3.2.3 IMSE Technology: Introduction
- 3.2.3 IMSE Technology: Process
- 3.2.3 IMSE Technology: Application Cases
- 3.2.3 IMSE Technology: Features and Advantages
- 3.3 CondAlign
- 3.3.1 Main Business

- 3.3.2 Operation
- 3.3.3 Conductive Film Products
- 3.4 Covestro
- 3.4.1 MakrolonAi Material
- 3.4.2 Makrofol Film
- 3.4.3 Bayfol Film
- 3.5 Marquardt
- 3.5.1 Mobile Living Room Combined with Smart Surface
- 3.6 CGT
- 3.7 UltraSense
- 3.7.1 Main Business
- 3.7.2 Dynamics
- 3.8 TouchNetix
- 3.9 Sekisui
- 3.9.1 Main Business
- 3.9.2 Product Application - 1
- 3.9.3 Product Application - 2
- 3.9.4 Product Application - 3
- 3.9.5 Product Application - 4
- 3.10 e2ip
- 3.10.1 Profile
- 3.10.2 Product Application -1
- 3.10.3 Product Application -2
- 3.11 Canatu
- 3.11.1 Profile
- 3.11.2 Operation
- 3.11.3 Product Application -1
- 3.11.4 Product Application -2
- 3.12 Kurz

# Table of Content (3)

- 3.12.1 Profile
- 3.12.2 Operation
- 3.12.3 Product Application
- 3.13 MacDermid
  - 3.13.1 Profile
  - 3.13.2 Operation
  - 3.13.3 Product Application - 1
  - 3.13.4 Product Application - 2
  - 3.13.5 Product Application - 3
  - 3.13.6 Product Application - 4
  - 3.13.7 Product Application - 5
  - 3.13.8 Product Application - 6
  - 3.13.9 Product Application - 7
  - 3.13.10 Product Application - 8
- 3.14 Joyson Electronic
  - 3.14.1 Profile
  - 3.14.2 Organization and Acquisition History
  - 3.14.3 Smart Surface Business
  - 3.14.4 3D View Control
  - 3.14.5 Smart Surface Ambient Light
- 3.15 Daming Electronics
  - 3.15.1 Business and Technology Introduction
- 3.16 Ways Electron
  - 3.16.1 Profile
  - 3.16.2 Business Introduction
  - 3.16.3 Smart Surface Business Development
- 3.17 Ningbo Huaxiang Electronic
  - 3.17.1 Profile
  - 3.17.2 Main Business

- 3.18 Zhenghai Technology
  - 3.18.1 Profile
  - 3.18.2 IML Business
- 3.19 Tinychip
  - 3.19.1 Profile
  - 3.19.2 TCAE31A-QDA2 Touch Solution
  - 3.19.3 TCAE12A/32A Touch Solution
- 3.20 Awinic Technology
  - 3.20.1 Smart Surface Button Design Structure
  - 3.20.2 Smart Surface Touch Feedback Technology
  - 3.20.3 Smart Steering Wheel Solution
  - 3.20.4 Chip Solutions
- 3.21 Sunlord Electronics
- 3.22 Nextinput

## **4 Solutions of Core Automotive Smart Surface OEMs**

### Comparison of OEM Smart Surface Models

- 4.1 Mercedes-Benz
  - 4.1.1 Mercedes-Benz EQS
  - 4.1.2 Mercedes-Benz Concept Car
  - 4.1.3 Smart Surface Becomes Interaction Medium for Mercedes-Benz MBUX System
- 4.2 BMW
  - 4.2.1 BMW 7 Series
  - 4.2.2 BMW iX
  - 4.2.3 iX Flow Concept Car
  - 4.2.4 E-Ink Process and Principles
- 4.3 Tesla
  - 4.3.1 Tesla Steering Wheel with Touch Surface

# Table of Content (4)

- 4.3.2 Analysis of Steering Wheel Touch Functions
- 4.4 Ferrari
  - 4.4.1 Analysis of Roma Model
  - 4.4.2 Analysis of Purosangue Model
- 4.5 SAIC IM Motors
  - 4.5.1 IM L7
  - 4.5.2 Smart Surface Process Principles
- 4.6 Hongqi
  - 4.6.1 Hongqi H9
  - 4.6.2 Hongqi E001
- 4.7 BAIC
  - 4.7.1 BEIJING-X7
- 4.8 Geely
  - 4.8.1 Geely Borui /ZEEKR X
  - 4.8.2 Seat Touch Panels
- 4.9 Peugeot Inception
- 4.10 Pininfarina
  - 4.10.1 Concept Car Teorema
- 4.11 Others
  - 4.11.1 ARCFOX Kaola
  - 4.11.2 Roewe Whale
  - 4.11.3 Buick Century
  - 4.11.4 Neta



## Beijing Headquarters

TEL: 13718845418

Email: [report@researchinchina.com](mailto:report@researchinchina.com)

Website: [ResearchInChina](http://ResearchInChina.com)

WeChat: Zuosiqiche



## Chengdu Branch

TEL: 028-68738514

FAX: 028-86930659