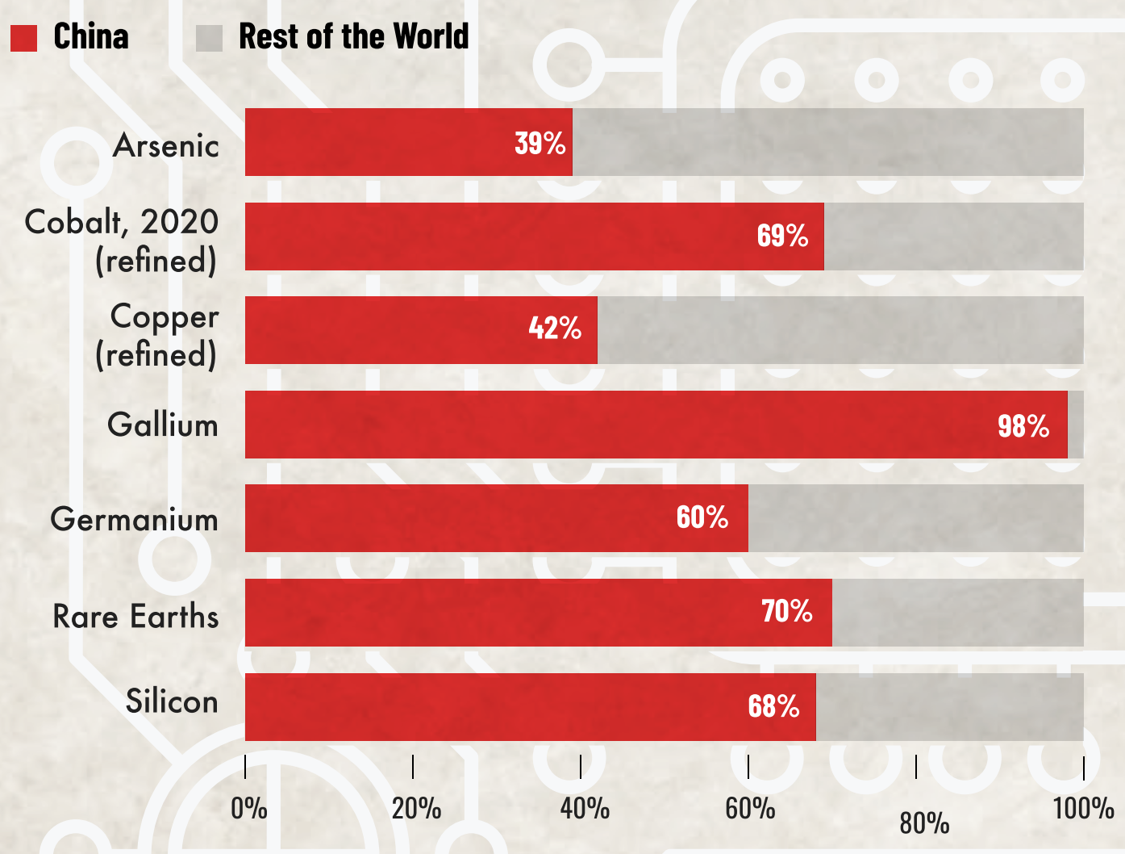
The Companies Behind the
Semiconductor Supply Chain

Semiconductors, also called microchips or integrated circuits (ICs), are electronic components that power everything from smartphones and cars to AI and the internet. This makes them incredibly valuable. From over $500 billion today, microchips are expected to be a $1 trillion industry within a decade. Behind these eye-grabbing figures lies one of the most complex supply chains in the world, with major economies and hundreds of companies vying for a piece of the trillion dollar pie. This graphic presents a list of the key companies at each step of the semiconductor supply chain, with an emphasis on China's footprint. Though this graphic covers all major microchip firms, it focuses on those involved in the production of advanced logic chips, the most valuable segment in the chip industry.

CHINA LEADS IN RAW MATERIALS...

Chinese companies produce much of the essential minerals and rare earth elements used in semiconductors.

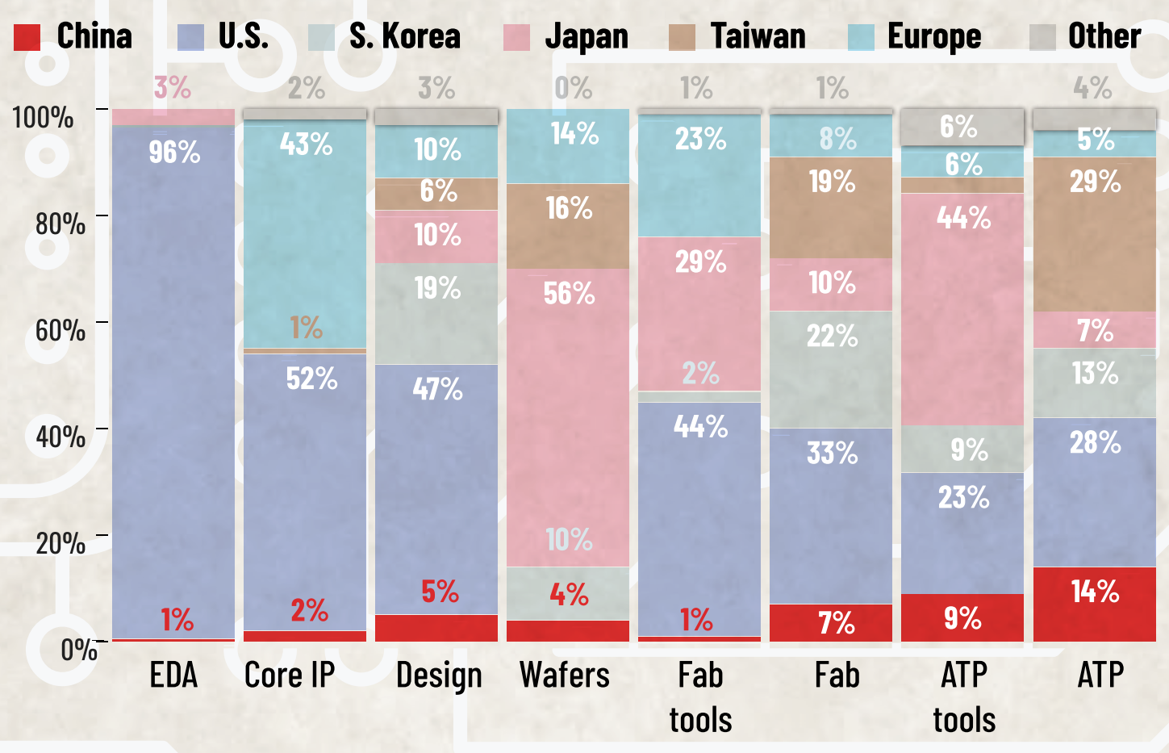
SHARE OF WORLD PRODUCTION, 2022



...BUT LAGS IN VALUE-CREATION

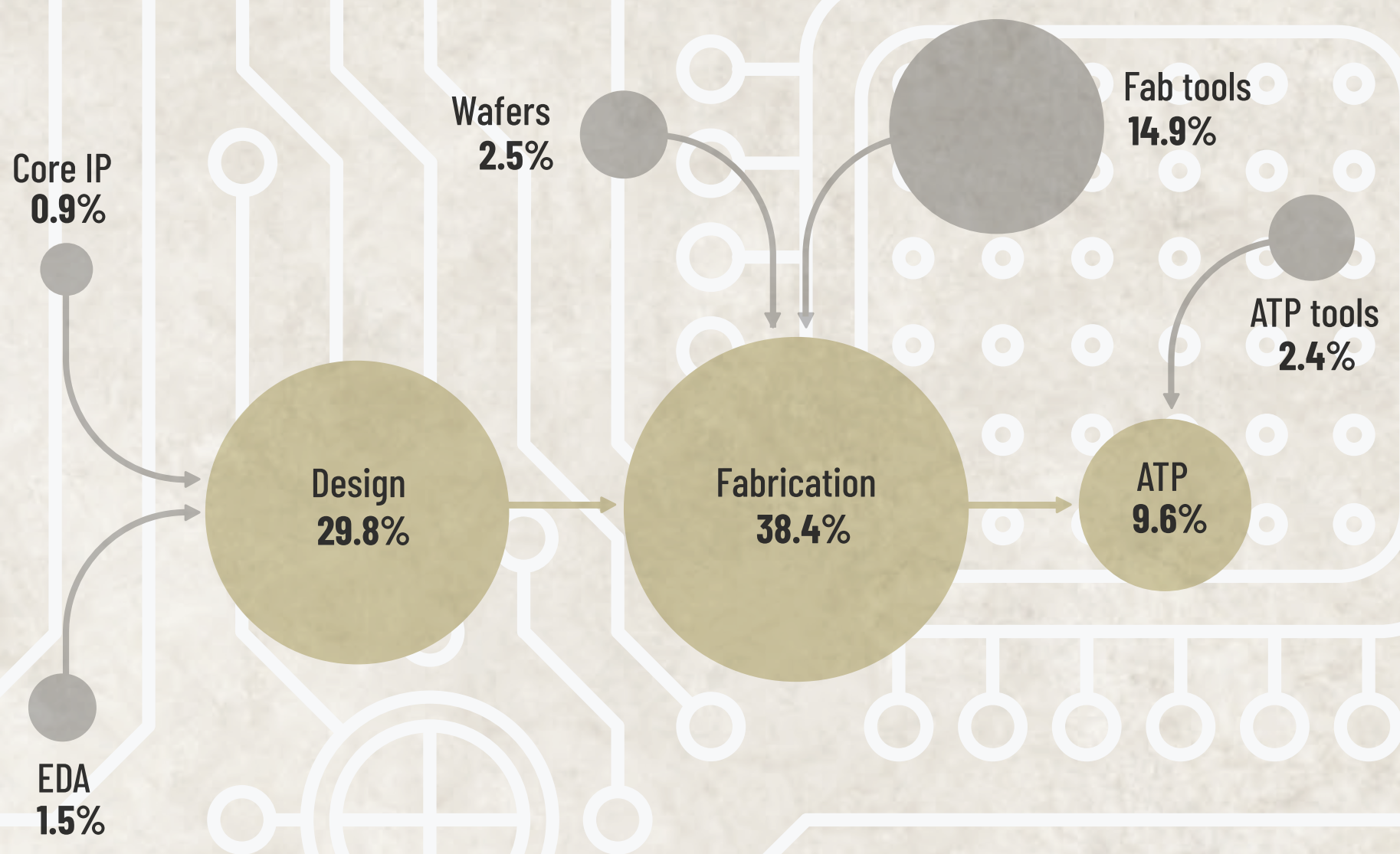
Though Chinese challengers are making rapid progress in advanced fabrication and design processes, cutting-edge chips are still the restricted domain of US, European, and Japanese firms that capture most of the market share and value-add in the supply chain.

SUPPLY CHAIN MARKET SHARE

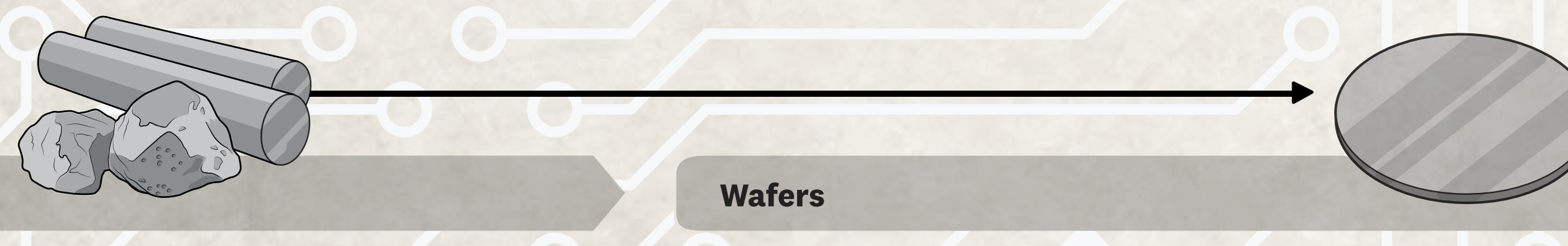


FOLLOW THE MONEY

Design and Fabrication companies take home the lion's share of the value created through the semiconductor supply chain. The percentages below represent the share of the total semiconductor value-add captured by companies at each stage



LEGEND ▨ Inputs to Core Supply Chain ▨ Core Supply Chain 🇨🇳 China 🇫🇷 France 🇩🇪 Germany 🇮🇱 Israel 🇮🇹 Italy 🇯🇵 Japan 🇲🇾 Malaysia 🇳🇱 Netherlands 🇳🇴 Norway 🇸🇬 Singapore 🇰🇷 South Korea 🇨🇭 Switzerland 🇹🇼 Taiwan 🇬🇧 United Kingdom 🇺🇸 USA



Polysilicon

These companies produce the material on which chips are built: polysilicon. Made from refined sand, semiconductor-grade silicon must be extremely pure.

INDUSTRY LEADERS

- 🇺🇸 Hemlock Semiconductor
- 🇯🇵 Mistubishi Materials
- 🇯🇵 Osaka Titanium
- 🇳🇴 REC Silicon
- 🇯🇵 Tokuyama
- 🇩🇪 Wacker Chemie

Wafers

Wafer companies manufacture polysilicon ingots (or provide the equipment to do so), which they then slice and polish to produce the millimeter thin silicon disks, or wafers, onto which hundreds of chips will be etched during the fabrication process.

INDUSTRY LEADERS

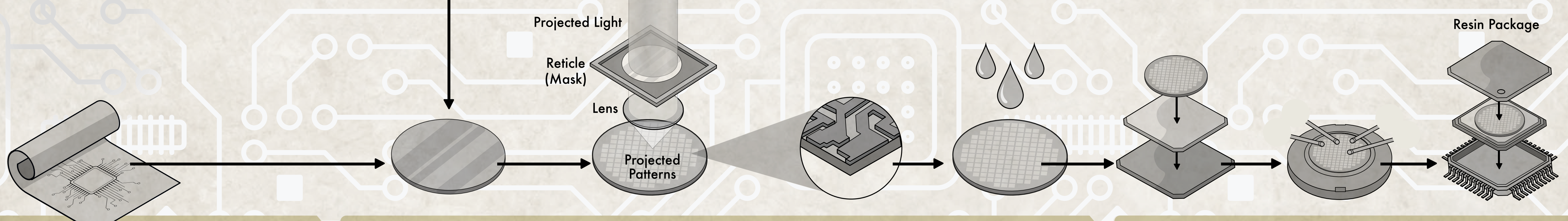
- 🇯🇵 Accretech
- 🇺🇸 Applied Materials
- 🇺🇸 Axcelis
- 🇯🇵 Disco
- 🇯🇵 Ferrotec
- 🇹🇼 GlobalWafers
- 🇨🇭 Meyer Burger
- 🇯🇵 Nissin Ion
- 🇯🇵 Okamoto
- 🇩🇪 PVA TePla
- 🇯🇵 Shin-Etsu
- 🇩🇪 Siltronic
- 🇰🇷 SK Siltron
- 🇯🇵 SMIT
- 🇫🇷 Soitec
- 🇯🇵 SUMCO
- 🇯🇵 Toyo Tanso
- 🇹🇼 Wafer Works

CHINESE CHALLENGERS

Firms that do not currently hold a substantial market share but are developing advanced capabilities and could help solidify China's place in the supply chain.

- 🇨🇳 Beijing JingYi
- 🇨🇳 CETC
- 🇨🇳 Gritek
- 🇨🇳 JRH
- 🇨🇳 JSG
- 🇨🇳 Kingstone
- 🇨🇳 MCL
- 🇨🇳 Okmetic (NSIG)
- 🇨🇳 POSHING
- 🇨🇳 Simgui
- 🇨🇳 Zhonghuan
- 🇨🇳 ZingSEMI

Click any underlined company to view the company profile in WireScreen



DESIGN

Design companies use core intellectual property and dedicated software to produce the blueprints for semiconductors and their billions of transistors.

INDUSTRY LEADERS

- 🇺🇸 AMD
- 🇺🇸 Apple
- 🇺🇸 Broadcom
- 🇨🇳 Cambricon
- 🇺🇸 Cirrus Logic
- 🇬🇧 Dialog
- 🇺🇸 Google
- 🇬🇧 Graphcore
- 🇹🇼 Himax
- 🇨🇳 HiSilicon
- 🇨🇳 Horizon Robotics
- 🇺🇸 Intel
- 🇨🇳 Intellifusion
- 🇺🇸 Marvell
- 🇹🇼 MediaTek
- 🇹🇼 Novatek
- 🇺🇸 NVIDIA
- 🇺🇸 OmniVision Technology
- 🇺🇸 Qualcomm
- 🇹🇼 Realtek
- 🇺🇸 Tesla
- 🇺🇸 Texas Instruments
- 🇨🇳 UNISOC
- 🇨🇳 Will Semiconductor
- 🇺🇸 Xilinx (AMD)
- 🇨🇳 Smartchip Microelectronics
- 🇨🇳 ZTE

CHINESE CHALLENGERS

- 🇨🇳 Efinix
- 🇨🇳 Gowin
- 🇨🇳 Huada Semi
- 🇨🇳 Jingjia Micro
- 🇨🇳 Loongson
- 🇨🇳 Phytium
- 🇨🇳 Shenzhen Pango
- 🇨🇳 Sunway
- 🇨🇳 Zhaoxin

Companies in the layer below supply inputs (e.g. software, materials or machinery) to the companies above.

Core Intellectual Property

These companies often license core design elements, like instruction set architectures (ISA), to design houses that want the intellectual rights to popular chip designs.

INDUSTRY LEADERS

- 🇺🇸 Achronix
- 🇬🇧 Alphawave
- 🇬🇧 ARM
- 🇺🇸 Cadence
- 🇺🇸 Ceva
- 🇹🇼 eMemory Technology
- 🇬🇧 Imagination Technologies
- 🇺🇸 Rambus
- 🇺🇸 SST
- 🇺🇸 Synopsys

CHINESE CHALLENGER

- 🇨🇳 Verisilicon

Electronic Design Automation Software

Electronic Design Automation (EDA) companies provide the software, and sometimes hardware, needed to produce manufacture-ready chip designs.

INDUSTRY LEADERS

- 🇺🇸 Ansys
- 🇺🇸 Cadence
- 🇩🇪 Siemens EDA
- 🇺🇸 Synopsys

CHINESE CHALLENGERS

- 🇨🇳 Arcas
- 🇨🇳 Huada Empyrean
- 🇨🇳 Microscape
- 🇨🇳 Platform Design Automation
- 🇨🇳 Primarius
- 🇨🇳 Semitronix
- 🇨🇳 Xpeedic

FABRICATION

Chip fabrication companies, called fabs or foundries, use wafer and design inputs to produce chips. This is the most valuable segment of the supply chain but also the most difficult — companies at this stage must master atomic-level precision at industrial scale.

INDUSTRY LEADERS

- 🇩🇪 Bosch
- 🇰🇷 DBHitek
- 🇺🇸 GlobalFoundries
- 🇨🇳 Hua Hong
- 🇩🇪 Infineon
- 🇺🇸 Intel
- 🇺🇸 Microchip
- 🇺🇸 Micron
- 🇨🇳 Nexchip
- 🇳🇱 NXP
- 🇹🇼 Powerchip
- 🇯🇵 Renesas
- 🇰🇷 Samsung
- 🇰🇷 SK Hynix
- 🇨🇳 SMIC
- 🇨🇭 STMicroelectronics
- 🇺🇸 Texas Instruments
- 🇯🇵 Toshiba
- 🇮🇱 Tower Semiconductors
- 🇹🇼 TSMC
- 🇹🇼 UMC
- 🇯🇵 VIS

A Closer Look at Nexchip

Founded in 2015, Nexchip Semiconductor Corporation ("Nexchip") specializes in 12-inch wafer semiconductor production. It is a joint-venture between Taiwanese chip-maker **Powerchip Technology** and a municipal Chinese government entity. In late 2021, Nexchip announced that it had reached a production capacity of 100,000 wafers per month, just under half of China's leading semiconductor foundry, SMIC. In May 2023, Nexchip's IPO raised $1.67 billion, the largest in Asia-Pacific at the time.

BENEFICIAL OWNERS

🇨🇳 Hefei Municipal SAMC	Chinese municipal government entity	Beneficially owns 39.74%
🇹🇼 Powerchip Technology	Taiwanese memory and IC chip manufacturer	Beneficially owns 20.58%
🇨🇳 Midea Group	Chinese household electronics conglomerate	Beneficially owns 4.39%
🇨🇳 Anhui Provincial Government SASAC	Chinese provincial government entity	Beneficially owns 1.64%
Other Institutional and Individual Investors		Beneficially owns 33.65%

Deposition Tools Materials

Companies in this segment provide the tools needed to deposit layers of conductive or insulating matter onto a chip's silicon base.

INDUSTRY LEADERS

- 🇺🇸 Applied Materials
- 🇰🇷 AP Systems
- 🇳🇱 ASM International
- 🇹🇼 Grand Process
- 🇨🇳 Grikin
- 🇺🇸 Honeywell
- 🇯🇵 JX Nippon
- 🇨🇳 KFMI
- 🇺🇸 KLA
- 🇯🇵 Kokusai
- 🇺🇸 Lam Research
- 🇬🇧 Linde
- 🇺🇸 Mattson Tech
- 🇺🇸 Screen
- 🇯🇵 Tokyo Electron
- 🇺🇸 Tosoh SMD
- 🇯🇵 ULVAC
- 🇺🇸 Veeco

CHINESE CHALLENGERS

- 🇨🇳 NAURA
- 🇨🇳 Piotech
- 🇨🇳 SKY Technology

Photolithography Tools & Materials

Lithography companies provide the tools needed to print complex designs onto the deposited layers. A single Dutch firm, ASML, has a monopoly on the most advanced form of photolithography (EUV).

INDUSTRY LEADERS

- 🇳🇱 ASML
- 🇯🇵 Dai Nippon
- 🇰🇷 Dongjin
- 🇺🇸 DuPont
- 🇺🇸 EMD Electronics
- 🇯🇵 Fujifilm Electronic Materials
- 🇺🇸 GlobalFoundries
- 🇯🇵 Hoya Corporation
- 🇺🇸 Inpria
- 🇺🇸 Intel
- 🇯🇵 JSR
- 🇯🇵 Nikon
- 🇯🇵 NuFlare
- 🇺🇸 Photronics
- 🇰🇷 Samsung
- 🇯🇵 Screen
- 🇯🇵 Shin-Etsu
- 🇯🇵 Sumitomo
- 🇩🇪 SUSS MicroTec
- 🇹🇼 TaiwanMask Corporation
- 🇯🇵 Tokyo Electron
- 🇯🇵 Tokyo Ohka Kogyo
- 🇯🇵 Toppan Photomasks
- 🇹🇼 TSMC

CHINESE CHALLENGERS

- 🇨🇳 JHM
- 🇨🇳 Kempur
- 🇨🇳 Kingsemi
- 🇨🇳 Nata Opto-electronic Material
- 🇨🇳 Ruihong
- 🇨🇳 Shenzhen Newway
- 🇨🇳 SMEE
- 🇨🇳 SMIC

Etching Tools Materials

Etching companies provide the tools needed to wash away undesired parts of a chip layer, allowing complex circuitry to be sculpted into a chip.

INDUSTRY LEADERS

- 🇨🇳 AMEC
- 🇺🇸 Applied Materials
- 🇯🇵 Hitachi
- 🇨🇳 Kingsemi
- 🇺🇸 Lam Research
- 🇨🇳 NAURA
- 🇯🇵 Screen
- 🇰🇷 SEMES
- 🇯🇵 Tokyo Electron

Processed Chemicals

These companies provide the specialized chemicals, like electronic gases or wet chemicals, needed as inputs throughout the fabrication process.

INDUSTRY LEADERS

- 🇫🇷 Air Liquide
- 🇺🇸 Air Products
- 🇨🇳 Anji
- 🇺🇸 Avantor
- 🇩🇪 BASF
- 🇺🇸 CMC
- 🇺🇸 DuPont
- 🇺🇸 Entegris
- 🇯🇵 Fujifilm Electronic Materials
- 🇯🇵 Fujimi
- 🇯🇵 Hitachi
- 🇺🇸 Honeywell
- 🇨🇳 Huate Gas
- 🇨🇳 Hubei Dinglong
- 🇨🇳 JHM
- 🇨🇳 Jinhong Gas
- 🇯🇵 JSR
- 🇯🇵 Kanto Chemical
- 🇺🇸 KMG Chemicals
- 🇰🇷 LG Chem
- 🇬🇧 Linde
- 🇩🇪 Merck Group
- 🇯🇵 Mitsui Chemicals
- 🇨🇳 Nata Opto-electronic Material
- 🇨🇳 PERIC
- 🇨🇭 Pureon
- 🇯🇵 Resonac
- 🇨🇳 Runma
- 🇫🇷 Saint-Gobain
- 🇨🇳 Sinophorus
- 🇨🇳 Sinyang
- 🇰🇷 SK Materials
- 🇹🇼 Taiwan Spec. Chem.
- 🇯🇵 Taiyo Nippon Sanso
- 🇺🇸 Thomas West
- 🇺🇸 Versum Materials
- 🇰🇷 Wonik

ASSEMBLY, TESTING & PACKAGING

Assembly, Testing and Packaging (ATP) companies prepare chips to be directly usable by smartphone, automotive, and other electronics manufacturers.

INDUSTRY LEADERS

- 🇺🇸 Amkor
- 🇹🇼 ASE
- 🇹🇼 Chipbond
- 🇹🇼 ChipMOS
- 🇰🇷 Hana Micron
- 🇨🇳 Hua Tian
- 🇺🇸 Intel
- 🇨🇳 JCET
- 🇹🇼 King Yuan (KYEC)
- 🇺🇸 Micron
- 🇹🇼 Powertech
- 🇰🇷 Samsung
- 🇹🇼 Sigurd
- 🇰🇷 SK Hynix
- 🇨🇳 Tongfu Microelectronics
- 🇹🇼 TSMC
- 🇲🇾 Unisem Berhad
- 🇸🇬 UTAC

Assembly Tools Materials

Companies that provide the dicing and bonding inputs needed to cut individual chips from wafers and attach them to substrates for easier handling.

INDUSTRY LEADERS

- 🇯🇵 Accretech
- 🇸🇬 ASM Pacific
- 🇸🇬 ASTI
- 🇳🇱 Besi
- 🇯🇵 Canon
- 🇺🇸 Cohu
- 🇨🇳 DIAS Automation
- 🇯🇵 DISCO
- 🇯🇵 Fasford Tech
- 🇨🇳 Grand Tec
- 🇩🇪 Grohmann
- 🇩🇪 Hesse
- 🇨🇳 Xinyichang
- 🇺🇸 KLA
- 🇰🇷 Koh Young Tech
- 🇰🇷 KOSES
- 🇸🇬 Kulicke & Soffa
- 🇨🇳 Longhill Industries
- 🇰🇷 MIRTEC
- 🇰🇷 PROTEC
- 🇯🇵 Shinkawa
- 🇰🇷 SSP
- 🇨🇭 SYNOVA

Testing Tools Materials

These firms provide the equipment needed to test chips for quality and discard those that do not function.

INDUSTRY LEADERS

- 🇨🇳 AccoTEST
- 🇯🇵 Accretech
- 🇯🇵 Advantest
- 🇸🇬 ASM Pacific
- 🇺🇸 Cohu
- 🇰🇷 DI
- 🇺🇸 FormFactor
- 🇨🇳 Grand Tec
- 🇨🇳 Xinyichang
- 🇯🇵 JEM
- 🇨🇳 JHT
- 🇰🇷 Korea Instrument
- 🇺🇸 Micro Control
- 🇯🇵 Micronics Japan
- 🇹🇼 MPI corporation
- 🇺🇸 National Instruments
- 🇺🇸 Nidec SVTCL
- 🇨🇳 Shanghai Juno
- 🇹🇼 STAr Technologies
- 🇮🇹 Technoprobe
- 🇺🇸 Teradyne
- 🇯🇵 TESEC
- 🇯🇵 Tokyo Electron
- 🇰🇷 TSE
- 🇰🇷 UniTest
- 🇰🇷 Will Technology

Packaging Tools Materials

Companies that provide the equipment needed to bond assembled chips to protective encasings that can be directly used to power other electronic products.

INDUSTRY LEADERS

- 🇨🇳 AKM Electronics
- 🇬🇧 Alent
- 🇺🇸 Amkor
- 🇸🇬 ASM Pacific
- 🇩🇪 BASF
- 🇳🇱 Besi
- 🇨🇳 Darbond
- 🇨🇳 DIAS Automation
- 🇨🇳 Doublink
- 🇨🇳 Grand Tec
- 🇰🇷 HANMI
- 🇩🇪 Henkel
- 🇩🇪 Heraeus
- 🇨🇳 HHCK
- 🇯🇵 Hitachi
- 🇨🇳 Hysol Huawei
- 🇯🇵 Ibiden
- 🇨🇳 Kangqiang
- 🇯🇵 Kyocera
- 🇰🇷 LG
- 🇯🇵 Mitsui High-Tec
- 🇹🇼 NanYa
- 🇯🇵 NGK
- 🇨🇳 Ningbo Hualong
- 🇯🇵 Nippon Micro
- 🇺🇸 Quik-Pak
- 🇰🇷 Samsung
- 🇯🇵 SH Material
- 🇨🇳 Shennan Circuits
- 🇯🇵 Shinko
- 🇨🇳 Sinopaco
- 🇯🇵 Sumitomo
- 🇯🇵 Tanaka
- 🇯🇵 Tanaka Denshi
- 🇯🇵 Toray
- 🇯🇵 TOWA
- 🇨🇳 Trinity Tech
- 🇨🇳 Wuxi Zhongwei
- 🇨🇳 YesDo
- 🇨🇳 Yongzhi
- 🇨🇳 Zhuhai ACCESS

Notes on WireScreen Data

Companies were included based on their relative importance in the supply chain, as measured by market share and/or technical ability. (Companies in each segment cover between 50 and 90+ percent of the market.) Information was gathered from corporate filings and investor presentations, expert interviews, press releases, academic papers, government reports, and other publicly available sources.

Integrated device manufacturers (IDMs) like Intel, Samsung, or Nvidia—who design, manufacture, and sell their own chips in-house—were not represented separately. Instead, they were included in segments in which they can be considered industry leaders.

Companies are listed in alphabetical order and organized by country based on where they are headquartered.

wire | screen

Sources: Company lists are based on WireScreen research and data with additional advanced logic chip data from the Emerging Technology Observatory's Supply Chain Explorer. Chinese shares of mineral production are based on the 2023 Mineral Commodity Summaries from the United States Geological Survey (USGS). Chinese production of Germanium is from the Critical Raw Materials Alliance. Nexchip ownership data is from WireScreen. Market share and value-add data is from Khan, Mann, and Peterson, "The Semiconductor Supply Chain: Assessing National Competitiveness", CSET, January 2021. Market share and value-add data is from 2019, see source for details.

Graphic by Hiram Henriquez | H2H Graphics & Design