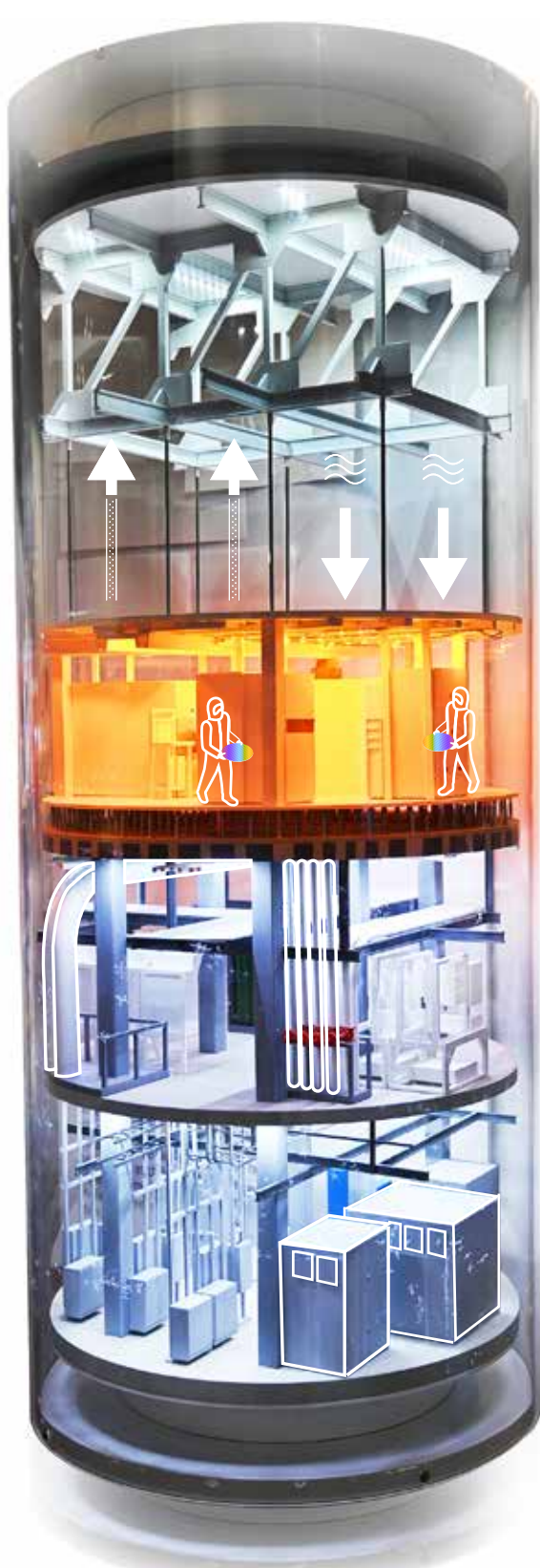


# What does it take to build a fab?

An Intel semiconductor factory, or fab, is a manufacturing marvel. Every hour, every day of the year, the 70-foot-tall structure produces millions of computer chips. With many comparable in size to a fingernail, the chips are the most complex products on Earth. A fab — which includes 1,200 multimillion-dollar tools and 1,500 pieces of utility equipment — takes about three years, \$10 billion and 6,000 construction workers to complete. Three of the fab's four levels support the clean room, the only place where actual chip production occurs.



Model of a fab currently on display at Intel Museum.

## 1. Interstitial and fan deck (top level)

The fan deck houses systems that keep the air in the clean room particle-free and precisely maintained at the right temperature and humidity for production. The interstitial is the tallest level of the fab.

## 2. Clean room level

A clean room is made up of more than 1,200 factory tools that take pizza-size silicon wafers and eventually turn them into hundreds of computer chips. Clean room workers wear bunny suits to keep lint, hair and skin flakes off the wafers.

**Fun Fact** Clean rooms are usually lit with yellow lights. The yellow lighting is necessary in photolithography to prevent unwanted exposure of photoresist to light of shorter wavelengths.

## 3. Clean subfab level

The clean subfab contains thousands of pumps, transformers, power cabinets and other systems that support the clean room. Large pipes called "laterals" carry gases, liquids, waste and exhaust to and from production tools. Workers don't wear bunny suits here, but they do wear hard hats, safety glasses, gloves and shoe covers.

## 4. Utility level

Electrical panels that support the fab are located here, along with the "mains" — large utility pipes and ductwork that feed up to the lateral pipes in the clean subfab. Also here are chiller and compressor systems. Workers who monitor the equipment on this level wear street clothes, hard hats and safety glasses.

## Fabs by the numbers

Intel has fabs in Oregon, Arizona, Ireland and Israel. Each fab is at least **250K** square feet.

**4** American football fields could fit inside the clean room.



Here are some examples of what it will take to complete one factory in Ireland.



The heaviest delivery included chillers at **50K** kilograms. That is equivalent to **12** average-size African male elephants.



The **5K** on-site tradespeople recently surpassed **11M** hours. That adds up to more than **1,255** calendar years.



**600K** cubic meters of concrete will be poured plus **75K** tons of steel reinforcement. This represents **2x** as much used to build the Burj Khalifa in Dubai, the world's tallest building.



**35K** tons of structural steel will be erected. That is **5x** the weight of the Eiffel Tower.



More than **1M** cubic meters of soil and rock will be removed. That is the equivalent of **400** Olympic-size swimming pools.



**9M** meters of cable will be installed. That is the distance equal to **214** full marathons.