

1. Smartphones and Tablets

Without plastics, the lightweight, rugged housings and many internal components (such as printed circuit boards) wouldn't be possible. Plastics make it possible to combine lightness and durability in portable devices.

2. E-mobility (Electric Vehicles)

Plastics are used in the automotive industry to reduce weight and enhance the efficiency of electric vehicles.

3. Renewable Energy (e.g., Solar and Wind Power)

Photovoltaic modules use plastic materials to create more efficient and longer-lasting solar cells, and in wind turbines, plastics are employed to manufacture lightweight, durable rotor blades.

4. 3D Printing (Additive Manufacturing)

Plastics are the core material for 3D printing. The development of specialized plastic printing materials has made this technology accessible to many industries.

5. Medical Technology and Medical Devices

Plastics are indispensable in medical technology—from prostheses and implants to single-use materials such as syringes and infusion bags.

6. Artificial Intelligence (AI)

Without plastics, the miniaturization of computer hardware required for AI and machine learning would not be possible. Plastics provide the necessary design flexibility and insulation for complex systems.

7. Wearable Technology (Wearables)

Wearables such as smartwatches feature plastic casings that are both durable and lightweight, and many also incorporate flexible plastics, e.g., to achieve water resistance.

8. Blockchain and Cryptocurrencies

The hardware for blockchain transactions uses plastics in enclosures, printed circuit boards, and microchips, all of which are necessary to enable these technologies.

9. Robotics and Autonomous Systems

Plastics in sensors, motors, cables, connectors and housings keep robots lightweight and weather-resistant.

10. Genome Editing (e.g., CRISPR Technology)

In biological research and in the development of CRISPR technologies, plastic materials are required for laboratory equipment, pipettes, and containers.

The 20 Most Important Innovations of the Last 20 Years—and Why They Wouldn't Exist Without Plastics

Status: March 2025, Norbert Müller with the assistance of ChatGPT

11. Water Supply and Treatment

Plastics are used in modern drinking-water systems to ensure water quality, prevent corrosion, and provide the necessary hygiene and durability for pipes and infrastructure.

12. Virtual Reality (VR) and Augmented Reality (AR)

Plastics are used in VR and AR devices to manufacture lightweight yet durable goggles and headsets that are both comfortable and long-lasting.

13. Artificial Organs and Bioprinting

Plastics are used in bioprinting technology to print cellular structures necessary for creating artificial organs.

14. Drones and Unmanned Aerial Vehicles (UAVs)

Lightweight yet robust composite designs enable the construction of drones capable of extended flight durations while remaining durable.

15. Smart Packaging

In the food industry, plastic packaging is increasingly being equipped with sensors that monitor product condition and extend shelf life.

16. Internet of Things (IoT)

The IoT relies on networked devices powered by information technology components. Plastics are used in displays, microchips, enclosures, and circuit boards for these devices.

17. Energy-Efficient Buildings (Passive Houses, Smart Homes)

Insulating plastics are used to make buildings energy-efficient and minimize heating and cooling costs. Plastics are also employed in heat pumps and solar thermal systems.

18. Autonomous Vehicles

Plastics contribute to lightweight vehicle construction, enabling greater range and improved energy efficiency in autonomous vehicles. They are also indispensable for the components of autonomous vehicle control systems.

19. Nanotechnology

In nanotechnology, plastics enable the fabrication of extremely fine structures used in medicine, electronics, and many other fields.

20. Synthetic Biology

In synthetic biology, plastic materials are used for culturing and storing microbes and organisms that produce biodegradable plastics or enable other biotechnological applications.