1. **Electroplating**

- Definition: The process of depositing a thin layer of metal onto a substrate by passing an electric current through an electrolyte solution containing metal ions.

- Phrases: electroplating process; electroplating bath

- Usage: Can be used as subject, object, etc. For example, "Electroplating is widely used in industry." (as subject); "We need to improve the electroplating quality." (as object)

- Bilingual Example: Electroplating can enhance the corrosion resistance of metals.

2. **Anodizing**

- Definition: A process that forms a protective oxide layer on the surface of a metal, usually aluminum, by making the metal the anode in an electrolytic cell.

- Phrases: anodizing treatment; hard anodizing

- Usage: For example, "Anodizing is an important surface treatment for aluminum products." (as subject)

3. **Painting**

- Definition: The application of paint or other coatings to a surface to provide protection, decoration, or other functional properties.

- Phrases: spray painting; powder painting

- Usage: Can be used to describe actions or processes. For example, "They are doing painting on the car body." (as object)

- Bilingual Example: Proper painting can prevent the metal from rusting.

4. **Galvanizing**

- Definition: The process of applying a protective zinc coating to steel or iron to prevent rusting, typically by hot-dip galvanizing or electro-galvanizing.

- Phrases: hot-dip galvanizing; galvanizing layer

- Usage: For example, "Galvanizing is a common method to protect steel structures." (as subject)

- Bilingual Example: Galvanized steel pipes are widely used in construction.

5. **Passivation**

- Definition: A process that makes a metal surface less reactive by forming a thin, protective film, often an oxide layer, which inhibits further corrosion.

- Phrases: passivation treatment; chromate passivation

- Usage: For example, "Passivation can improve the stability of the metal." (as subject)

- Bilingual Example: The passivation process helps to maintain the luster of the stainless steel.

6. **Polishing**

- Definition: The process of using abrasive materials to smooth and shine a surface, reducing surface roughness and improving appearance.

- Phrases: mirror polishing; electro-polishing

- Usage: Can be used to describe specific operations. For example, "He is responsible for the polishing of the metal parts." (as object)

- Bilingual Example: Polishing can enhance the aesthetic value of the product.

7. **Sandblasting**

- Definition: A process in which fine particles of sand or other abrasive materials are propelled at high speed onto a surface to clean, roughen, or etch it.

- Phrases: dry sandblasting; wet sandblasting

- Usage: For example, "Sandblasting is often used to prepare the surface before painting." (as subject)

8. **Powder Coating**

- Definition: A method of applying a dry powder coating to a surface, which is then cured by heat to form a continuous, durable film.

- Phrases: thermosetting powder coating; powder coating equipment

- Usage: For example, "Powder coating is becoming more and more popular in the industry." (as subject)

- Bilingual Example: This product has a beautiful finish after powder coating.

9. **Chrome Plating**

- Definition: The process of depositing a thin layer of chromium onto a substrate by electroplating to improve appearance, hardness, and corrosion resistance.

- Phrases: bright chrome plating; hard chrome plating

- Usage: For example, "Chrome plating is commonly used on automotive parts." (as subject)

- Bilingual Example: Chrome plated bathroom fixtures look very shiny.

10. **Nickel Plating**

- Definition: The process of depositing a layer of nickel onto a substrate by electroplating to enhance corrosion resistance, hardness, and appearance.

- Phrases: electroless nickel plating; nickel plating bath

- Usage: For example, "Nickel plating can protect the metal from environmental damage." (as subject)

- Bilingual Example: Many electronic components require nickel plating.

11. **Phosphating**

- Definition: A chemical treatment that forms a phosphate conversion coating on a metal surface to improve paint adhesion and corrosion resistance.

- Phrases: zinc phosphating; iron phosphating

- Usage: For example, "Phosphating is an important pretreatment before painting." (as subject)

12. **E-coating**

- Definition: A process in which a coating material is deposited on a conductive substrate by electrophoresis, where charged particles move in an electric field.

- Phrases: cationic e-coating; anionic e-coating
- Usage: For example, "E-coating is widely used in the automotive industry for primer application." (as subject)
- Bilingual Example: E-coating can ensure uniform coating thickness on complex-shaped parts.

13. **Chemical Conversion Coating**
- Definition: A thin film formed on a metal surface through a chemical reaction, which can provide protection, improve adhesion, or have other functional properties.
- Phrases: chemical conversion coating process
- Usage: For example, "Chemical conversion coatings can enhance the corrosion resistance of metals." (as subject)
- Bilingual Example: This type of chemical conversion coating has excellent anti-corrosion performance.

14. **Shot Peening**
- Definition: A process in which small spherical shots are projected at high speed onto a metal surface to introduce compressive stresses, improving fatigue resistance and strength.
- Phrases: laser shot peening; shot peening machine
- Usage: For example, "Shot peening is an effective way to enhance the mechanical properties of parts." (as subject)

15. **Black Oxide Coating**
- Definition: A process that forms a black oxide layer on the surface of a metal, usually iron or steel, for corrosion protection and decorative purposes.
- Phrases: black oxide treatment
- Usage: For example, "Black oxide coating gives the metal a unique appearance." (as subject)
- Bilingual Example: The black oxide coated parts have a certain degree of corrosion resistance.

16. **Tin Plating**
- Definition: The process of depositing a layer of tin onto a substrate by electroplating or other methods to improve solderability and corrosion resistance.
- Phrases: hot dip tin plating; electro-tin plating
- Usage: For example, "Tin plating is often used in the electronics industry." (as subject)

17. **Silver Plating**
- Definition: The process of depositing a layer of silver onto a substrate by electroplating to enhance conductivity, reflectivity, and appearance.
- Phrases: bright silver plating
- Usage: For example, "Silver plating is commonly used in jewelry and electrical contacts." (as subject)
- Bilingual Example: The silver plated items have a shiny and attractive appearance.

18. **PVD Coating**

- Definition: A group of processes that deposit a thin film of material onto a substrate in the gas phase, including evaporation, sputtering, etc., to improve surface properties such as hardness, wear resistance, and aesthetics.
- Phrases: PVD coating technology
- Usage: For example, "PVD coating can significantly improve the performance of cutting tools." (as subject)
- Bilingual Example: The PVD coated tools have a longer service life.

19. **CVD Coating**

- Definition: A process in which a chemical reaction occurs in the gas phase to deposit a solid film on a substrate, used to improve surface properties like hardness, corrosion resistance, etc.
- Phrases: CVD coating process
- Usage: For example, "CVD coating is widely used in semiconductor manufacturing." (as subject)
- Bilingual Example: CVD coatings can provide excellent protection for semiconductor devices.

20. **Microarc Oxidation**

- Definition: A surface treatment process that generates micro-scale arcs on the surface of a metal in an electrolyte solution, forming a ceramic-like oxide coating with improved hardness, wear resistance, and corrosion resistance.
- Phrases: microarc oxidation technology
- Usage: For example, "Microarc oxidation can enhance the performance of aluminum alloys." (as subject)