

Wrought Wires – Types and Uses

Dental wrought wires are specially designed wires made from metals such as stainless steel, cobalt-chromium, or nickel-titanium alloys. These wires are formed by processes like drawing, twisting, or bending, which give them specific properties, such as flexibility, strength, and resilience. Dental wrought wires are essential components in orthodontics and prosthodontics, helping in the correction of malocclusions, retention of teeth post-treatment, and fabrication of dental appliances.

Types of Dental Wrought Wires

1. Stainless Steel Wrought Wires

Composition: Stainless steel wrought wires are made primarily of iron and carbon with chromium and nickel.

properties:

- High tensile strength
- Resilient
- Resistant to corrosion

Uses:

- fixed orthodontic appliances (braces)
- archwires
- springs wires



2. Nickel-Titanium (NiTi) Wrought Wires

Composition: A mixture of nickel and titanium, which gives these wires unique properties.

Properties:

- Superelasticity
- Resistance to corrosion and wear.



Uses:

- Preferred for aligning and leveling teeth due to their gentle and continuous force application.

3.Cobalt-Chromium Wrought Wires

Composition: Made from a blend of cobalt and chromium

Properties:

- High strength and rigidity.
- Excellent resistance to corrosion.

Uses:

- complex orthodontic cases (patients with severe malocclusions).
- Ideal for fabricating retainers.

**4.Titanium Wrought Wires**

Composition: Pure titanium or titanium alloys.

Properties:

- Lightweight and biocompatible.
- High strength
- Resistance to corrosion and oxidation.
- more flexible than stainless steel

Uses:

- construction of retainers and space maintainers.
- patients with sensitivities or allergies because it biocompatible.

**5.Beta-Titanium Wrought Wires**

Composition: A mix of titanium, vanadium, and aluminum.

Properties:

- more flexibility than stainless steel.
- Offers an excellent balance between strength and flexibility.

Uses:

- Used in the middle and final stages of orthodontic treatment to provide gentle force for tooth alignment.

Properties of Wrought Wires

1. **Flexibility:** This flexibility is essential for gentle and continuous tooth movement without causing excessive discomfort.
2. **Strength:** for maintaining their shape under the forces applied during orthodontic treatment.
3. **Formability:** Wrought wires can be easily bent, twisted, and shaped without breaking.
4. **Corrosion Resistance:** Materials like stainless steel and titanium offer excellent corrosion resistance.
5. **Memory and Superelasticity:** This feature allows for consistent force application over time.

Uses of Dental Wrought Wires**1.Orthodontic Applications:**

- Archwires
- Ligatures and Springs
- Braces and Retainers
- Space Maintainers
- Retainers

2.Prostodontics:

- Denture Framework

3.Surgical Applications:

- Fixation and Support
- Maxillofacial Surgery

