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# Mixing of semisolids

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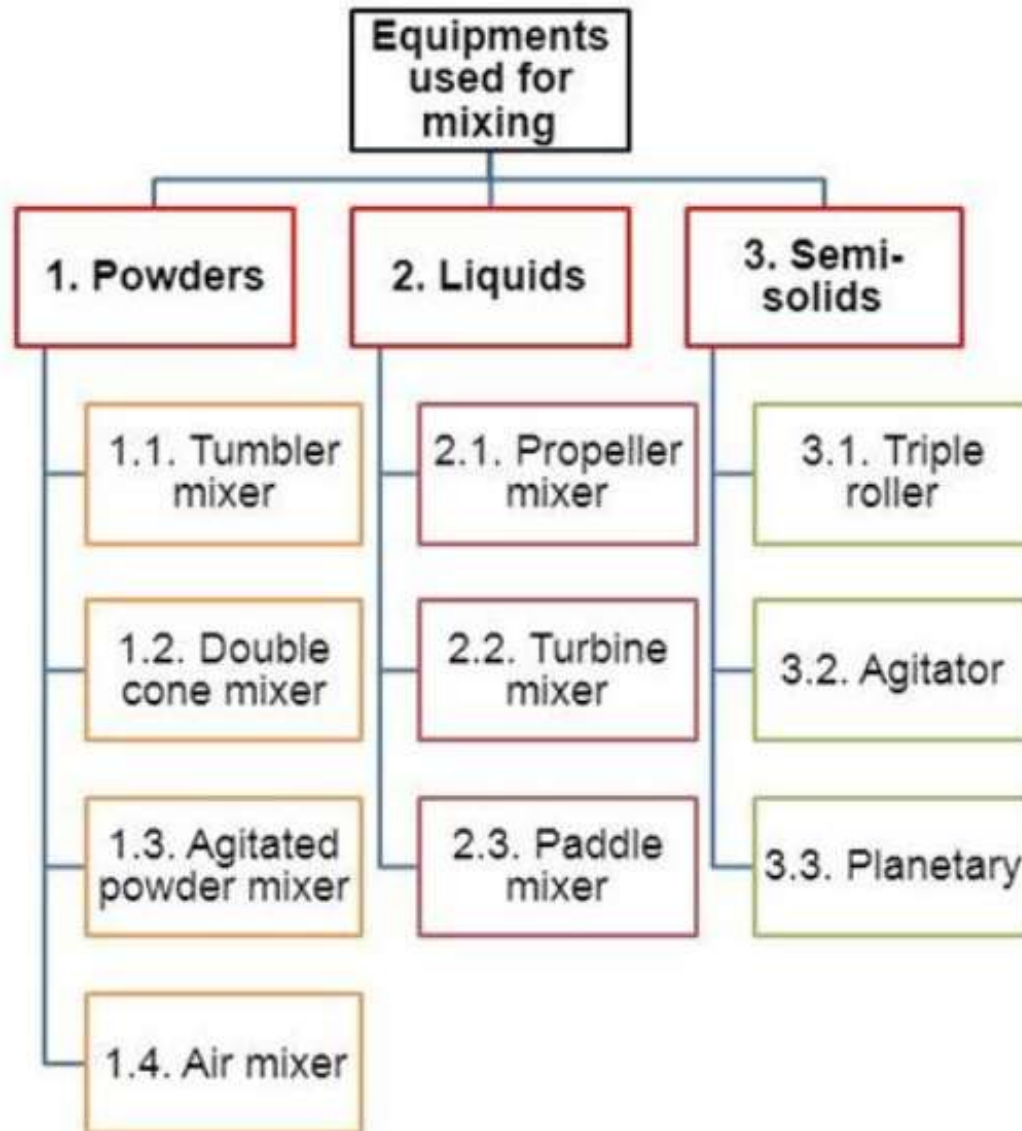
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**4. Homogenization** (Mixing of immiscible Liquids)

- 4.1. Hand homogenizer
- 4.2. Silverson homogenizer
- 4.3. Colloidal mill

**5. Viscosity**



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## 3.1. Triple roller mill

### Construction:

1. The mill consists of **3 rollers** which are made of a hard abrasion-resistant material.
2. The rollers are rotated at **different speeds**.
3. The material coming between the rollers is **crushed depending on the gap between them**.

### Working:

1. The material from hopper comes b/w **roller 1 and 2** and **reduces size**.
2. The mixture further crushes and smoothen **b/w 2 and 3**.
3. The gap b/w roller **2 and 3 is lesser** compare to gap b/w 1 and 2.
4. A **scraper** is arranged in **roller 3** to remove the **mixed material**

**Use:** Mixing of solid powder in ointment base

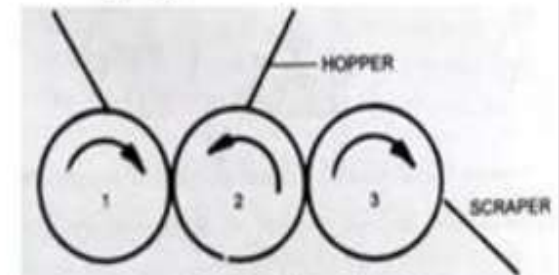


Fig. 7-5 Triple roller mill



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## 3.2. Agitator mixer

1. The mixture has 2 blades, the shape of which resembles the Greek letter 'Sigma'.
2. The two blades move at different speeds and towards each other.
3. The blades operate are fitted in to the vessel.
4. The two blades rotate at different speeds, one usually twice the speed of the other which causes the pulling of the material.

### Use:

The sigma arm mixer is commonly used for mixing of dough ingredients in the bakery industry.

It is used for mixing of powder drug with an ointment base.





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## 3.3. Planetary mixer

**Principle:** The blade **tears** the mass apart and **shear** is applied b/w a **moving blade** and **stationary wall**. The **mixing arm** moves around its own axis and also around the **central axis** in order to reach every spot of the vessel.

**Construction:** Stationary **stainless steel vessel** and **mixing blade**.

**Working:** The blade is **moved slowly** at the **initial stage** for premixing of the material and finally at **increased speed** for active mixing.

**Use:** Planetary mixtures are used in **wet granulation** for its **kneading action**.



**Kneading action**

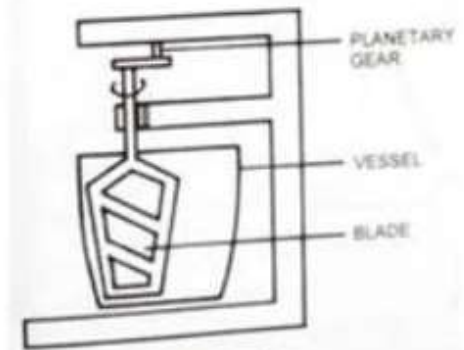


Fig 7-6 Planetary mixer



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Thank you

