**MKPPL- MEMANTINE HCL ER PELLETS**

Memantine is used to treat moderate to severe [Alzheimer's disease](https://en.wikipedia.org/wiki/Alzheimer%27s_disease). It acts on the [Glutamatergic system](https://en.wikipedia.org/wiki/Glutamatergic_system) by blocking [NMDA receptors](https://en.wikipedia.org/wiki/NMDA_receptor). It was first synthesized by [Eli Lilly and Company](https://en.wikipedia.org/wiki/Eli_Lilly_and_Company) in 1968 as a potential agent to treat diabetes. Memantine exerts its action through uncompetitive NMDA receptor antagonism, binding preferentially to the NMDA receptor-operated cation channels. Prolonged increased levels of glutamate in the brain of demented patients are sufficient to counter the voltage-dependent block of NMDA receptors by Mg2+ ions and allow continuous influx of Ca2+ ions into cells, ultimately resulting in neuronal degeneration.

Studies suggest that Memantine binds more effectively than Mg2+ ions at the NMDA receptor and thereby effectively blocks this prolonged influx of Ca2+ ions through the NMDA channel whilst preserving the transient physiological activation of the channels by higher concentrations of synaptically released glutamate. Thus Memantine protects against chronically elevated concentrations of glutamate.

**INNOVATOR**

**NAMENDA XR** capsules are supplied for oral administration as 7, 14, 21, and 28 mg capsules. Each capsule contains extended release beads with the labeled amount of Memantine HCl and the following inactive ingredients: sugar spheres, polyvinyl pyrrolidone, hypromellose, talc, polyethylene glycol, ethyl cellulose, ammonium hydroxide, oleic acid, and medium chain [triglycerides](https://www.rxlist.com/script/main/art.asp?articlekey=8880) in hard gelatin capsules.

**MKPPL MEMANTINE PELLETS EQUIVALENT TO INNOVATOR PRODUCT (NAMENDA XR)**

The Extended release pellets are the mixture of two types of pellets. Part A contains immediate release pellets as a loading dose for onset of action and Part B contains extended release pellets as a maintenance dose. These two types of pellets are blended together and the final strength of pellets is 10.56% w/w. This strength is dose equivalent and same pellets are used for different doses by changing the fill weight and capsule size for respective doses.

The strength of the pellets is,

* 10.56% w/w for dose of 14 mg with average capsule fill weight 133 mg in size 4capsule.
* 10.56% w/w for dose of 21 mg with average capsule fill weight 199 mg in size 3 capsule
* 10.56% w/w for dose of 28 mg with average capsule fill weight 265 mg in size 2 capsule

The formulation is based on the preparation of dispersion of drug in purified water and homogenization to reduce the particle size of active ingredient, to achieve the dissolution equivalent to innovator.

The particle size distribution is measured at solution preparation stage and after loading of the drug to the spheres.

Based on reviewing the product we have adapted the process of Fluid bed coating.

In case of Fluid bed coater, the solution of Memantine along with other ingredients like Sodium Lauryl Sulphate, Hydroxy propyl methyl cellulose, talc is sprayed on Sugar spheres. This drug loaded pellets are further coated with release controlling polymer for e.g. Ethyl cellulose to achieve the desired release profile.

Multimedia dissolution study is conducted for both innovator and the MKPPL product.

Based on the stability study data the expiry date of the product is 3 years from the date of manufacturing.

**MEMANTINE HCL ER PELLETS**

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