



## DuraSolv® and OraSolv® Orally Disintegrating Tablet Technologies

CIMA LABS is the established leader in orally disintegrating tablet (ODT) drug delivery. It is currently the only company to offer compressed (OraSolv, DuraSolv) and lyophilized (Lyoc™) ODT technologies, all of which have been successfully commercialized. In the past decade, CIMA LABS' OraSolv and DuraSolv technologies have been used to develop close to a dozen orally disintegrating tablet (ODT) products that are marketed in over 35 countries.

All of CIMA LABS' ODT technologies meet the CDER definition of an ODT: "A solid dosage form containing medicinal substances, which disintegrates rapidly, usually within a matter of seconds, when placed upon the tongue." Orally disintegrating dosage forms are growing in popularity because they offer many advantages to patients and physicians, such as:

- Convenience – Can be taken with or without water.
- Great taste – Bitter drugs can be taste-masked and many flavor options are available.
- Ease of administration – Disintegration of the dosage form in the mouth makes swallowing the dosage form an easy task.
- Discreet – Taken whenever and wherever patients want – quick disintegration of tablet, convenient unit dose blister packaging.
- Safety – Blisters can be made to meet many child-resistant packaging requirements.

DuraSolv and OraSolv technologies can be used to develop immediate release or sustained release oral dosage forms. Both technologies are manufactured by direct compression using conventional tableting equipment, and can be easily engraved. Over 10 products have been commercialized using CIMA LABS' OraSolv and DuraSolv technologies.

Once placed in the patient's mouth, an ODT will disintegrate rapidly without any voluntary action by the patient (such as chewing). When the tablet disintegrates, the drug microparticles are released and are swallowed as a slurry or suspension. If the drug microparticles are not taste-masked, some dissolution may occur in the mouth. Upon swallowing, the microparticles reach the patient's GI tract, where complete dissolution and systemic absorption of the drug takes place. If the drug particles are taste-masked, dissolution occurs in the GI tract.

Typically, the ODT pharmacokinetic profile is matched to that of the oral swallowable dosage form.

The OraSolv ODT technology uses taste-masked drug microparticles in a formulation that enhances tablet disintegration. Carbon dioxide is generated by a reaction of the formulation components upon exposure to water (saliva in the mouth). This causes a sensation in the mouth that is pleasant to the patient and tends to stimulate further saliva production, which also aids in disintegration.

In addition to the drug and effervescent component, the OraSolv technology uses generally recognized as safe (GRAS) excipients, which may include a filler, disintegrant, flavor, sweetener, lubricant and color. The OraSolv technology has been used for drug strengths in the range of 1 mg to 750 mg. Depending on formulation and tablet size, the disintegration time of the tablet can be designed in the range of 10 to 40



seconds. With OraSolv tablet technology, tablets are compressed to a hardness of 6 – 25 N and packaged in blister cards.

The DuraSolv technology has a formulation similar to the OraSolv technology, combining taste-masked drug microparticles with or without a low effervescence-containing formulation. DuraSolv technology has been developed for drug strengths in the range of 125 mcg to 500 mg with disintegration times designed in the range of 10 to 50 seconds. However, with DuraSolv technology, tablets are compressed to a greater hardness of 15-100 N, resulting in a more durable ODT. As a result, DuraSolv technology enables packaging flexibility; tablets can be bottled and blistered.

CIMA LABS offers the PakSolv® packaging service and technology as part of the partnership with other companies for use in manufacturing OraSolv and DuraSolv products. The packaging system forms blister units, gently places the tablets in the blisters and places a seal on the blister, which protects the tablets from light and moisture. The PakSolv service has been used for a variety of partnered products.

If you are interested in learning about CIMA LABS' compressed ODT drug delivery technologies for your molecule, please contact Richard Welter, Ph.D., V.P. of Business Development at 763-488-4790 or John C. Nagel, MBA, Senior Director of Business Development at 763-488-4975.

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