



ANIMAL HEALTH DIVISION

Technologies & Services



A modern pharma plant GMP authorised as a pharmaceutical industry for VETERINARY use PRODUCTS

Friulchem AH division is a fully compliant with the EU cGMP. Since 2007, it is a dedicated finished product manufacturer and R&D service provider for the veterinary pharmaceutical industry, creating an intensive experience in blending, micronization and granulation of pharmaceutical and nutraceutical products.

During the years, Friulchem has incremented its field of action adding to these types of production the self-development of veterinary drug products and feed for animals, thanks to the strengthening of the internal R&D laboratory.

Today Friulchem's strategy is to develop specific & unique Drug Deliveries Platforms exclusively for the Animal Health and to invest in new manufacturing units to apply the technologies.

In 2015, we will add two manufacturing sites dedicated to veterinary products.





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Key figures

Private Company with 2 Shareholders:

Evultis SA (Swiss) with 78% & Friulia Spa, Italian regional financial institution with 22%

Two locations

Vivaro (Pn): Plant, Laboratory & R&D

Milano: Commercial, Business Development and Administration

Number of employees:

30 people (10 people in R&D)

Present total annual capacity per shift

Pharmaceutical

Granulation: 180 Tons

Micronization: 110 Tons

Blending: 200 Tons

Spry-Drying: 18 Tons

Chewable Tablets: 20 Million

Packaging: 2 Million sachets

Feed & Additives

Granulation: 160 Tons

Premixes: 900 Tons

Medicated Premixes: 600 Tons

Chewable Tablets: 20 Millions

Packaging: 2 Million sachets

Packaging: 500.000 bottles



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Key Technology Platforms

Friulchem has a number of proprietary drug delivery technologies at its disposal.

Friulchem adapts these technologies to support our partners in their product development to design the ideal product.

FC Granulation Technology

We have developed a unique granulating and coating technology that allows to protect APIs from the mechanical stress during the preparation of premixes as well protect fragile compounds such as microorganisms, enzymes, yeasts & bacteria.

FC Effervescent Technology

Friulchem has designed a special production line that allows to combine products like amino-acids and sugars granulated with the “FC Granulation Technology”. Thus, dust is avoided, with the addition of the effervescence improve the dissolution.



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FC Cube Technology

Friulchem has developed a different manufacturing method that allows to reach a chewable matrix with all the benefits presented for the drugs already on the market, but without the limit connected with production by extrusion.

Friulchem technology is based on a compression stage, which shows different advantages compared to extrusion:

- Compression allows the manufacture of products with higher fat and palatable material content, which leads to perfect appetency (total ingestion by animals even on a repeat basis);
- Compression provides full control over the weight of the chewable cube and hence over the quantity of API contained in each unit of the finished product, thereby guarantees compliance with therapeutic treatment.

Due to the high palatability showed in the preliminary tests performed, FC-cubes could be used to prepare formulations that can include:

- Active pharmaceutical ingredients:
- Antibiotics, Antiparasitic, Insecticide, Anti-inflammatory, Cardiotonic
- Nutraceutical products: Additives, Vitamins, Minerals

The matrix composition developed in Friulchem is 100% palatable and able to mask also active components that are particularly disliked by the animals.



FC-CUBES
A **chewable and tasty** solution for
healthy pets.



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FC Balls Technology

Friulchem is now developing an innovative Proprietary Matrix for the Vectorization of Active Ingredients with multiple benefits.

Applicable to all finished products using water as the excipient, diluent or carrier.

Allows the distribution of active ingredients, although insoluble, in all concentrations:

- In the drinking water;
- In the pour on formulations, avoiding leaching by rain;
- Preparation of shampoos, lotions and similar;
- Environmental protection.

Can be used to develop:

- Control released formulations;
- Gastro resistant formulations.



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Friulchem Established Technologies & Services

FC Micronization Technology

At Friulchem, we use a jet mill micronizer. We can grant the homogeneity of the particle size of the products and the stability because we use only high pure nitrogen that ensures perfect preservation during the micronization process.

FC Blending Technology

At Friulchem, we use bins of different capacity to blend different APIs alone or with excipients. This choice allows us a perfect containment of the powders.

We have added a Glove Box line to be able to blend and also package hygroscopic products.



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Friulchem Established Technologies & Services

FC Spray Drying Technology

Friulchem is one of the few companies that is operating this technology dedicated to the animal health.

Spray drying is a method of producing a dry powder from a liquid or slurry by rapidly drying with hot gas. This is the preferred method of drying of many thermally-sensitive materials such as pharmaceuticals.

PACKAGING LINE FOR SACHETS

The products, in powder or granulated form, can be packed in sachets from 50 g up to 1.000 g. Thanks to a special system to draw the air from the product, Friulchem will be able to package also voluminous product, increasing in this way the specific weight.



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Friulchem Feed Department & Services

Friulchem decided to invest in the production of feed supplements and complementary feed to complete our offer.

In the following years, the activity was strongly focused on the production of complementary feeds and premixes for the livestock sector and the pet-food industry.

Based on our proprietary technologies, Friulchem is able to implement any formulation for integrating the feed, even on technical specification required by the end user, be it a feed mill or a farm. Friulchem offers custom formulations designed to make farmers use products grown in their companies.



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Quality Control and R&D Laboratory

Control Quality Laboratory is composed by a chemical unit and a microbiological unit. It make strict controls on raw material arrival, during the manufacturing process and on the final product.

Control quality laboratory is equipped with state of the art instrumentation:

Light Scattering Particle Size Analyzer

HPLC – DAD

Millipore Milliflex Filtration System

NIR spectrophotometer

Karl Fischer Titrator

TOC Analyzer

In addition Control Quality Laboratory renders:

- validation of manufacturing process and DMF;
- developing and validation of chemical analytical methods, chemical-physical and microbiological.



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Regular Pharmaceutical products manufactured in Friulchem

Premixes

- Amoxicillin granules
- Amoxicillin Micro
- Amoxicillin Micro + Colistine Sulphate
- Chlortetracycline
- Doxycillin granules
- Flumequine
- Lincomycin
- Lincomycin + Spectinomycin
- Sulfadiazine+Trimetoprim
- Spiramycin
- Tiamuline granules
- Tylosin
- Florfenicol
- Enrofloxacin

Soluble products

- Amoxicillin+Clavulanic
- Amoxycillin
- Doxycillin
- Lincomycin
- Lincomycin + Spectinomycin
- Sulfamethazine + Sulfathiazole
- Tiamulin

Micronized

Micronized & sterilized products

- Amoxicillin
- Ampicillin
- Penicillin G Procain
- Penicillin G Benzathine
- Cloxacillin Benzathine
- Cloxacillin Sodium
- Colistine Sulphate



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Regular Feed supplements manufactured in Friulchem

Premixes & Additives granules

- Vitamins
- Minerals
- Amino Acids
- Enzymes
- Coccidiostats
- Probiotics
- Prebiotics
- Aromas

Effervescent soluble granules

- Vitamins
- Minerals
- Amino Acids
- Enzymes
- Coccidiostats
- Probiotics
- Prebiotics
- Aromas

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