
Fermion
Fermion
APIs and Contract Manufacturing Services

Generic API

CDMO API

CMO Drug product

Orion at a glance (2020 figures)

Net sales
1,078 MEUR

Operating profit
280 MEUR

Personnel
3,311

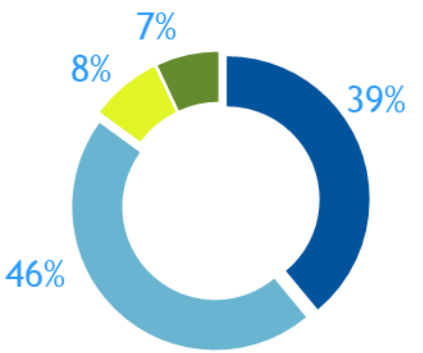
R&D investments
123 MEUR

6 production sites in Finland

Own sales unit in **26** European countries, Singapore, Malesia and Thailand

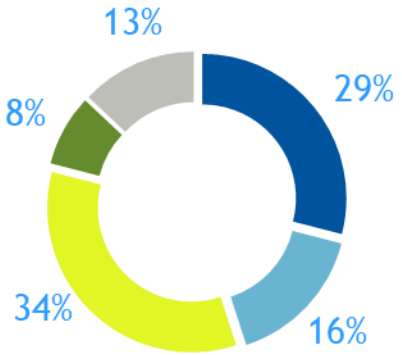
Established in **1917**

Sales by business

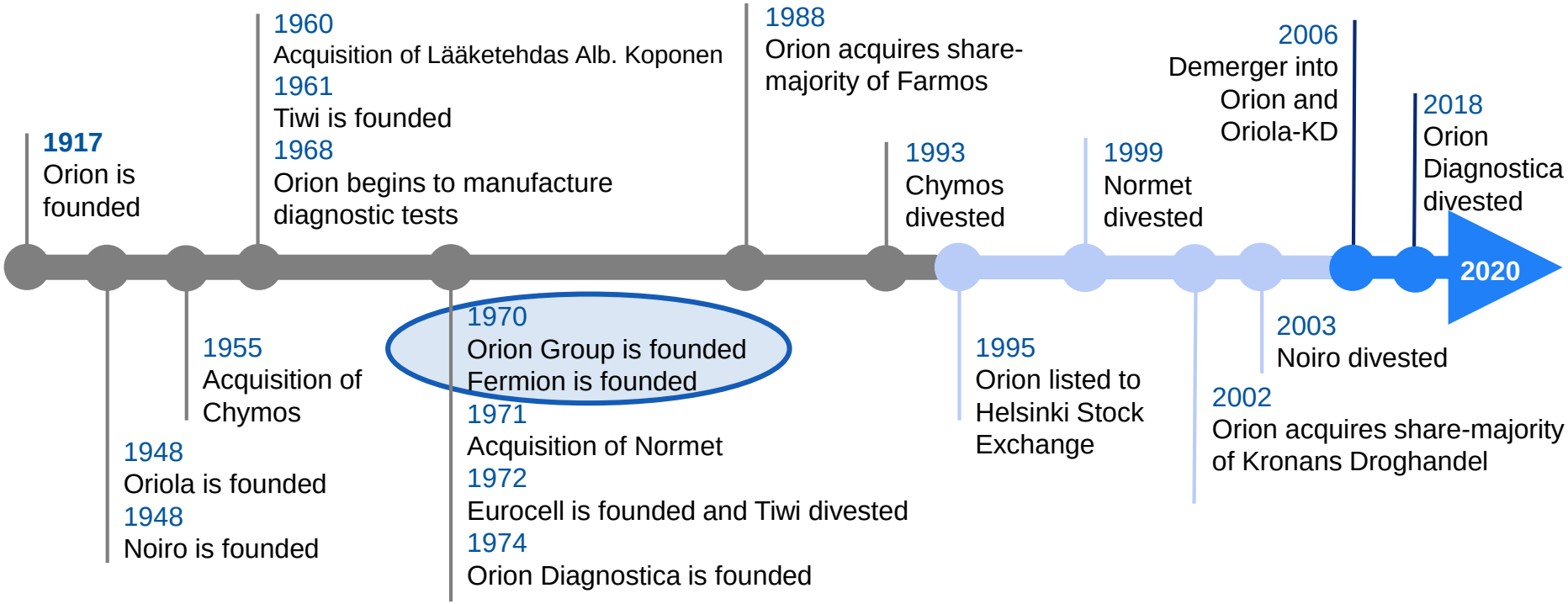


*) Contract manufacturing

Sales by market area



A century of Finnish industrial history



Orion businesses

Proprietary Products

In-house developed drugs and other drugs with valid product protection for global markets. Own sales network in Europe. The most recent approved innovative drug is Nubeqa (NCE darolutamide)

Specialty Products

Generic prescription drugs, OTC and non-medicinal products, biosimilars.

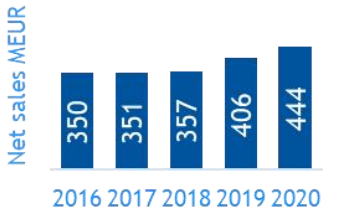
Finland	56%
Scandinavia	16%
Eastern Europe	14%
ROW	14%

Animal Health

Own animal drugs for global markets. Other drugs and well-being products. Own sales network in the Nordics and Eastern Europe.

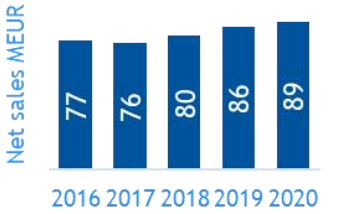
Fermion & Contract manufacturing

Active pharmaceutical ingredients (APIs) for own proprietary products. CMO & CDMO services for other pharma companies.



39%

46%



8%

7%

= share of Group net sales in 2020

Fermion Oy in 2020

- **Develops, manufactures and sells active pharmaceutical ingredients (APIs)**
- **Markets drug product contract manufacturing services of Orion**

Net sales 102 MEUR:
External 58 %, Internal 42 %

Personnel ca. 370

Main office, S&M, R&D & Bench scale unit and Registration in Espoo

2 production sites: Hanko and Oulu Finland

Close to 230 customers,
ca. 30 products

- **2020 Net sales 102 M€ (external 59 M€, internal 43 M€)**
- **Focus on APIs that are challenging to manufacture - special expertise in the manufacturing of high potency APIs**
- **Leading global market share in some of its own products**
- **Main market areas are the United States, Europe, India, South Africa and Japan**

Fermion and CM strategic targets → Growth and profitability

Target to grow over 50% by 2025

Contribute to the growth and profitability of Orion Corporation

Maximise the external generic API business

Continue the renewal of generic API portfolio

Drive the growth of API CDMO business

Develop DP CMO business building on Orion's operational strengths and API business synergies

Improve productivity and ensure forecasted volume growth

Fermion’s management

Arto Toivonen
President

Marjaana Tapio
Vice President, Operations

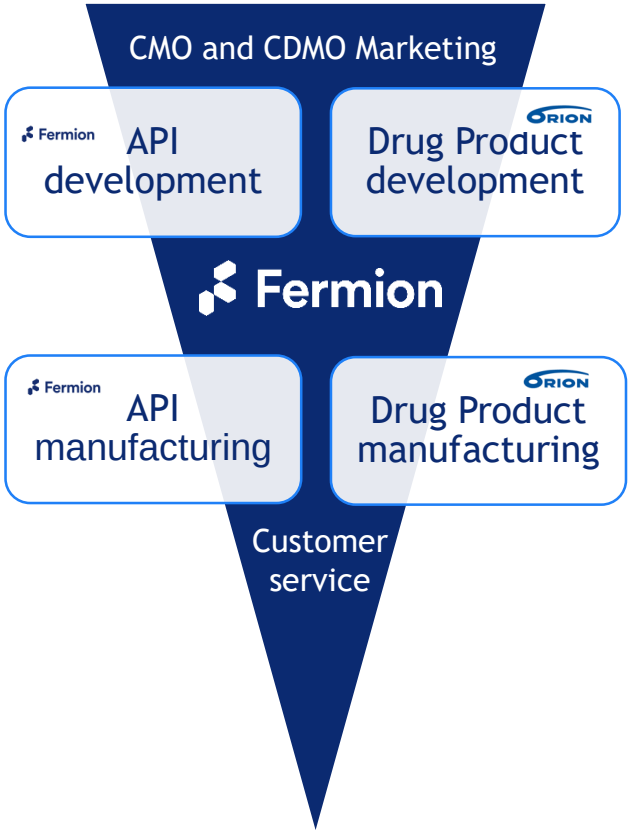
Arne Grumann
Vice President, R&D

Satu Vartiainen
Vice President, Quality Management

Marko Salo
Vice President, Marketing and Sales

Tuomo Virolainen
Finance manager

Contract development and manufacturing at Orion Group



API and Drug Product sites

Espoo

Turku

Salo

Hanko

Oulu

Kuopio

Locations and facility profiles

Turku Plant | ~500 SC and QM employees

Dosage forms
- Hormone gels & solutions
- Tablets & capsules
- Potent & cytotoxic tablets & capsules
- Creams & ointments

Salo Plant | ~110 SC and QM employees
- Centralized warehouse
- Tablet packaging
- Serialization

Hanko Fermion plant | ~180 employees
- Large volume APIs
- Potent OEB4 APIs

Oulu Fermion plant | ~100 employees
- Highly potent, OEB4-5 APIs
- Cytotoxic APIs
- OEB5 micronization

Kuopio Plant | ~50 SC and QM employees

Dosage forms
- Non-sterile liquids, suspensions
- Nasal & topical sprays, drops
- Rectal enemas

Espoo Plant | ~730 SC and QM employees

Dosage forms
- Small-volume parenterals
- Tablets & capsules
- Inhalations
- Kilo-scale R&D API unit

Orion has invested over 160 M€ to its manufacturing units during the last five years

2012-2015:
Espoo unit expansion

2013-2014:
New packaging and logistics center in Salo

27 Me

2011-2014:
Fermion Oulu HPAPI unit expansion

2012-2014:
Turku unit expansion

2015:
Fermion kilo scale API unit expansion

HANKO 2018

2015-2019:
Fermion Hanko, new large scale unit 4

40 Me

2019-> :
Continuous investements to improve EHS, automation, process analytics and AI

2020-> :
New blister line for cytotoxic oral solids and renovation of ointment department at Turku 17 Me

Fermion

Generic API

Fermion has a strong position in global market with a number of its generic APIs

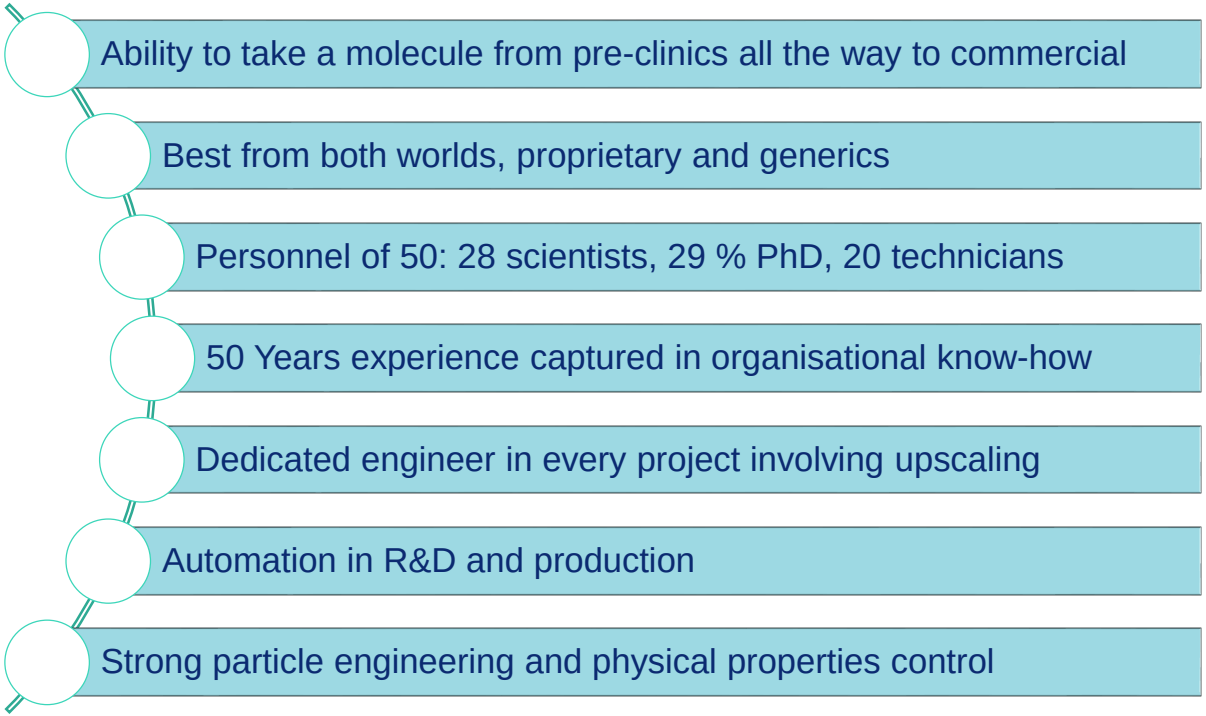
Product	US DMF	Europe CEP	Japan JMF	Specification
Alprazolam	✓	✓	✓	USP, Ph.Eur.
Azathioprine	✓	✓	✓	USP, Ph.Eur.
Benserazide		applied		Ph.Eur.
Budesonide		applied		
Buspirone HCl	✓	ASMF		USP, Ph.Eur.
Cabozantinib	✓			
Carbidopa	✓	✓		USP, Ph.Eur.
Dexmedetomidine	✓	ASMF	✓	
Diltiazem HCl	✓	ASMF		USP, Ph.Eur.
Entacapone	✓	ASMF		USP, Ph.Eur.
Fluticasone propionate		applied		
Flutamide	✓	✓		USP, Ph.Eur.
Formoterol fumarate	✓	✓	✓	USP, Ph.Eur.
Glipizide	✓			USP
Hydroxychloroquine sulphate	✓	✓		USP, BP
Irinotecan HCl	✓	✓	✓	USP, Ph.Eur.
Levosimendan	✓	ASMF		

Product	US DMF	Europe CEP	Japan JMF	Specification
Mercaptopurine	✓	✓	✓	USP, Ph.Eur.
Methotrexate	✓	✓	✓	USP, Ph.Eur.
Methotrexate disodium	✓	ASMF		USP, Ph.Eur.
Nadolol	✓	ASMF	✓	USP, Ph.Eur.
Nintedanib	✓	ASMF		
Nitrofurantoin Macrocrystals	✓	applied		
Nitrofurantoin Monohydrate	✓	ASMF		
Propafenone HCl	✓	✓		USP, Ph.Eur.
Quetiapine fumarate	✓	✓		USP, Ph.Eur.
Salmeterol xinafoate		✓		Ph.Eur.
Sodium cromoglycate	✓	✓	✓	USP, Ph.Eur.
Tamsulosin HCl	✓		✓	USP, Ph.Eur.
Tolnaftate	✓	ASMF		USP, Ph.Eur.
Toremifene Citrate	✓	ASMF	✓	
Trazodone HCl	✓	ASMF		USP, BP
Vemurafenib				

Fermion

CDMO API

Fermion R&D at your disposal



Our approach for NCE Drug Substance development

API for	Phase I	Phase II	Phase III	Commercial
Our goal	Robust and safe process	Target to select SMs, synthesis route and discrete parameters after PII campaigns	Optimization of process parameters (DoE as needed)	Finalization of the process
Synthesis and process development	✓ Route suitability ✓ Discrete parameters ✓ Impurity control (organic, mutagenic) for API to meet specifications ✓ Physical characteristics as needed	✓ Impurity studies continued ✓ Physical characteristics, crystallization & milling studies	✓ Critical parameters ✓ NOR & PAR determination	✓ Process validation ✓ Process life cycle management
Analytical method development	✓ Development of analytical methods for SMs, IMs and API ✓ Validation of API analytical methods	✓ Development of analytical methods for SMs, IMs and API ✓ Validation of API analytical methods	✓ Development of analytical methods for SMs, IMs and API ✓ ICH level validation of API analytical methods	✓ Finalization and validation of analytical methods for SMs, IMs and API
Tasks applicable for all phases	✓ Setting appropriate specifications ✓ Safety studies ✓ Impurity profile ✓ Control strategy ✓ IND / IMPD and finally DS sections to NDA/MAA or separate DMF			

Fermion has highly automated production units with recent expansions to highly potent compound (OEB4-5) manufacturing capabilities

Espoo R&D bench scale

- Small quantities for developmental purposes and clinical studies
- HPAPI handling capability up to OEB 5
- QC lab for development and PM

Oulu production incl. R&D pilot

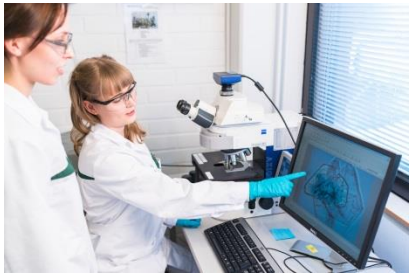
- 75 m^3 reactor volume
- Small volume commercial products
- HPAPI handling capability, including micronisation, up to OEB 5
- Production QC lab

Hanko production

- 250 m^3 reactor volume
- Large volume commercial products
- HPAPI handling capability up to OEB 4-5
- Production QC lab

Fermion Quality System

- Fermion's Quality System complies with the **ICH Q7 GMP Guide for API's"** and the **EU GMP guideline** "The Rules Governing Medicinal Products in the European Union – **Part II: Basic requirements for Active Substances used as Starting Materials".** The Quality System follows also the ICHQ9 guideline (Quality Risk Management), the ICHQ10 guideline (Pharmaceutical Quality System) and all other relevant guidelines for API manufacturing and GMP.



- The main Quality System elements are Change Control, Risk Management, CAPA, Deviation Management, OOS Management, SOP system and Internal Audits. The Management is committed to the continuous improvement of the Quality System. The QMS is reviewed annually in the Management Review.

- Quality Unit is involved in all GMP critical operations during the whole product lifecycle from the development phase to regulatory filing and market.

Fermion is regularly inspected by health authorities

- Fimea inspected Espoo and Oulu plants in Feb 2020. Based on Fimea inspection also FDA classified Oulu plant as acceptable (MRA applied).

CFDI = Center for Food and Drug Inspection

NMPA= National Medical Products Administration

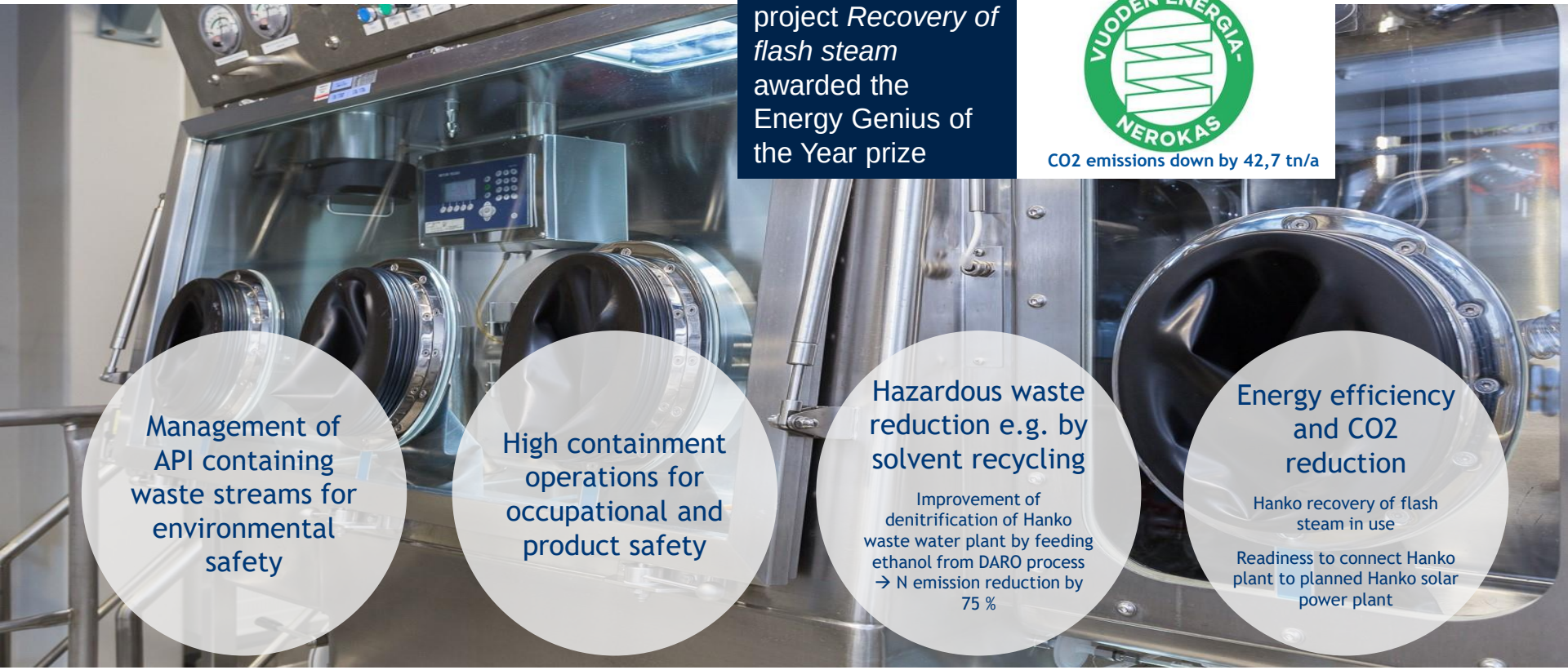
	Espoo	Hanko	Oulu
FIMEA (* unit IV)	1995 1998 2002 2004 2007 2010 2013 2015 2017 2020	1995 2002 2005 2008 2011 2014 2017 2018*	1995 2002 2005 2008 2011 2014 2017 2020
US FDA	1993 1995 1997 1998 2001 2003 2011	1992 1993 1995 1997 1998 2001 2004 2007 2011 2014 2016 2018	1992 1995 1997 2001 2003 2006 2010 2013 2016 2017 2020
MOH (Mexico)			2010
KFDA (Korea)			2010
ANVISA (Brazil)			2011 2016
PMDA (Japan)		2006	

Sustainability in Fermion

Fermion Oulu plant project *Recovery of flash steam* awarded the Energy Genius of the Year prize

VUODEN ENERGIA-NEROKAS

CO2 emissions down by 42,7 tn/a



Management of API containing waste streams for environmental safety

High containment operations for occupational and product safety

Hazardous waste reduction e.g. by solvent recycling

Improvement of denitrification of Hanko waste water plant by feeding ethanol from DARO process → N emission reduction by 75 %

Energy efficiency and CO2 reduction

Hanko recovery of flash steam in use

Readiness to connect Hanko plant to planned Hanko solar power plant

Fermion

CMO Drug product

If you are looking for a partner who...

Delivers

with high reliability
throughout product life cycle

WE OFFER

- Established and highly developed processes and technologies
- Approvals of global regulatory bodies and long track record of inspections
- On-time delivery reliability
- Sustainability, CSR and EHS practices well in place
- **Our experience to Customers**

Helps

you to get your product
from development to the market

WE OFFER

- Upscaling product to commercial stage
- Wide expertise throughout the whole value chain
- Diverse production and process capability as your needs grow
- Tailor-made complex solutions
- **Our established processes to Customers**

Espoo plant capabilities

Tablet production

- Direct mixing, high shear mixing, fluid bed drying
- Batch sizes of over 400kg
- OEB4
- 1,5 billion tablets/capsules in 2020

SVP production

- Vials (5-36ml) and ampoules (2-5ml)
- 20-600 litre batch sizes
- OEB 4-5 and products for human and veterinary use
- Flammable material handling
- Solutions and suspensions
- 158 bulk batches and 2,5m packages with serialization in 2020

Latest inspections by main authorities at Espoo site

Authority	Date	Area
FDA (USA)	May 24-Jun 1, 2018	Sterile and non-sterile production (GMP)
ANVISA (Brazil)	Apr 24-28, 2017	Sterile and non-sterile production
FIMEA (Finland)	Sep 14-17, 2020	Sterile and non-sterile production
INAME (Argentina)	Aug 31- Sep 4, 2009	Non sterile production
KFDA (Korea)	Nov 3-5, 2009	Non sterile production
MOH (Turkey)	Apr 18-22, 2016	Sterile and non-sterile production
The Turkish Ministry of Food, Agriculture and Livestock (MoA)	Jan 15-18, 2018	Sterile productions (Veterinary productions)
MoIT (Russia)	January 22-24, 2020	Non sterile production

Turku plant capabilities

Oral solids production

- Direct mixing, high shear mixing, fluid bed drying
- Batch sizes starting from less than 100kg
- OEB5, cytotoxics
- 1 billion tablets / capsules in 2020
- 2,3 million packages of cytotoxic oral solids in 2020

Non-hormonal creams, ointments and liquids production

- One syringe line, two tube lines, one bottle line
- 150-1000 litre batch sizes
- OEB4-5, products for human and veterinary
- 811 tons of bulk product in 2020
- 4,8 million packages in 2020

Hormonal gels, creams and solutions production

- Single dose sachet line and three lines for bottles, all with serialization
- 150-200 litre batch sizes
- OEB4-5
- 99 tons of bulk product in 2020
- 2,7 million packages with serialization capability in 2020

Latest inspections by main authorities at Turku site

Agency	Date	Subject
FDA (USA)	Sep 2-6, 2019	Non sterile production (all departments)
FIMEA (Finland)	May 8-10, 2019	Non sterile production (all departments)
MOH (Turkey)	Apr 16-20, 2012	Anti-Cancer Dept
ANVISA (Brazil)	Aug 13-17, 2018	Two products
KFDA (Korea)	May 6-8, 2013	Hormone Gel Dept
Taiwanese Authorities	Mar 6-8, 2013	Hormone Gel Dept
Gulf States (Saudi-Arabia, Bahrain, Kuwait)	Apr 14-16, 2014	Anti-Cancer Dept
MoIT (Russia)	Jun 20-21, 2018	One Product

Tablet packaging operations at a glance

All Orions' tablet packaging operations centralized to Salo site, excluding cytotoxics, β-lactames, cephalosporines and sex-hormones.

Facts:

- 7 packaging lines, 4 bottle line and 3 blister line
- More than 42 million sales packages per year
- 3 shifts, ~85 employees
- 10 000 m2 total, clean areas 5000 m2

Latest inspections by authorities at Salo site

Authority	Date	Area
FIMEA (Finland)	Feb 27 – 28, 2018	Non sterile packaging and warehousing
FDA (USA)	Sep 28 – 29, 2015	Non sterile packaging and warehousing (PAI/GMP)
ANVISA (Brazil)	Dec 12-16, 2016	Non sterile packaging and warehousing
MOH (Turkey)	Oct 10-13, 2016	Non sterile packaging and warehousing
The Turkish Ministry of Food, Agriculture and Livestock (MoA)	Jan 17, 2018	Non sterile packaging and warehousing
MoIT (Russia)	Jan 20-21, 2020	Non sterile packaging and warehousing

Orion’s Sustainability Agenda and indicators 2020

Patient safety and ensuring reliable supply of medications

Responsibility for the environment

Responsibility for Orionees

Business ethics and transparency

Customer complaints (pharmaceuticals)	GxP* audits by Orion	Greenhouse gas emissions (scope 1&2)	Energy savings target set for 2025 achieved	Injury rate	Code of Conduct training, no. of participants
76	141	18,611	53%	3.6	3 410
Ppm (76)	(238)	tCO2e (20,123)	(51%)	LTIF 1 (6.6)	

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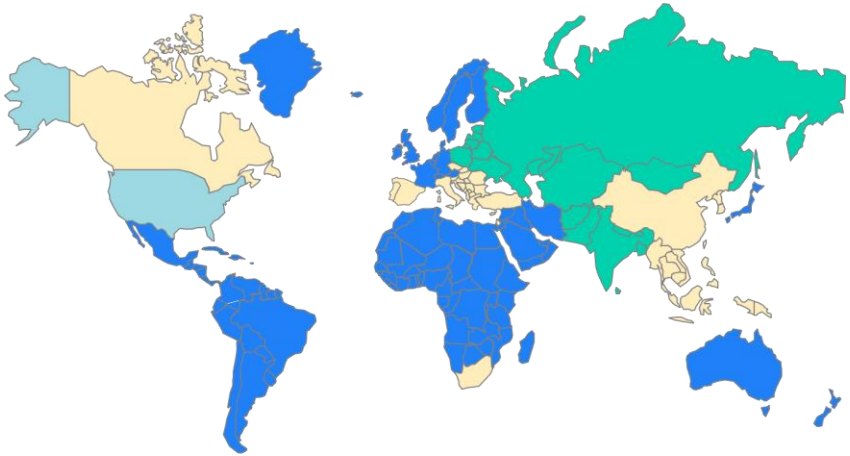

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with
us