

Unit operations in NIZO food grade Processing and Application centre

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| Product preparation | Dairy application | Butter ripeners | 110 L batch size |
| | | Cheese preparation | 1200 and 2000 L batch size |
| | | Yoghurt (drinks) | Variable |
| | Ice cream | Ice cream | 80 L batch size |
| | Processed cheese, Spreads and emulsions | Stephan cutters | 4 and 40 L batch size |
| | Soups and sauces | Votators | Continuous, 40 L/h |
| | Beverages | Centrifugal mixer (Limitech) | 150 L batch size |
| | | Bag in box from 2 to 10 L (in combination with e.g. UHT) | 125 L/hr |
| | | Flexible filling (laminar flow cabinet) | Various shapes and volumes |
| Mixing and dissolving | | Colloid mills | 2 types |
| | | Powder dissolving line | |
| | | Powder blending and mixing | 150 kg and 400 kg batch size |
| Pasteurisation and UHT | | Direct and indirect steam injection | 125 L/h |
| | | Tube heat exchanger | 125 L/h |
| | | Plate heat exchangers | 125, 600, 2000 and 10.000 L/h |
| | | Scraped surface heat exchangers | 40 and 300 L/h |
| Homogenization | | Single stage - up to 300 bar | 100 - 500 L/h |
| | | Two stages (also aseptic) - up to 1.500 bar | 150 - 1000 L/h |
| Extrusion | | Cross beater mill | 50 kg/h |
| Separation | Separators | Bactofuge | 10.000 l/h |
| | | Centrifuges (e.g. bactofugation, decreaming) | 10.000 l/h |
| | | Decanters | 500 and 1500 L/h |
| | Membrane filtration | Microfiltration (1 stage) | 0.1 - 10 m ² |
| | | Nanofiltration/Reversed Osmosis (1 and 2 stage) | 6 - 24 m ² |
| | | Pervaporation | 0.4 m ² |
| | | Ultrafiltration (1 to 3 stages) | 1.5 - 160 m ² |
| | Filtration | Filter belt | 100 - 300 L/h |
| | Chromatography | | 30 cm column diameter |
| | Evaporation | Experimental falling film evaporator pipe | 40 L/h |
| | 4 stage falling film evaporators | 300 and 2000 L/h | |
| | 2 stage scraped surface evaporator | 100 - 200 L/h | |
| Upstream processing | Fermentation | Aerobic | 10, 75, 450 L |
| | | Anaerobic | 10, 75, 450, 2500 and 4000 L |
| | Hydrolysis | Tanks in various capacities | Max. 8000 L per tank |
| Drying | Bench top | Glatt agglomerator | 1 to 5 kg |
| | | Spray dryer (Büchi) | Max. 100 g batch size |
| | Drum drying | Single drum | 110 L water evaporation/h |
| | | Double drum | 60 L water evaporation/h |
| | Spray drying | Single stage - rotary atomizer or nozzle | 25 L water evaporation/h |
| | Multistage - spray nozzles | 250 L water evaporation/h | |

By using our extensive network we have access to many other unit operations