



AMBERPACK[®] DEMINERALISATION PLANT



**NZMP, Clandeboye
September 2002**

Contact:

Filtration Technology Ltd

36 Sir William Avenue, East Tamaki, Auckland
PO Box 58853, Greenmount, Auckland
New Zealand

Phone: ++64-9-274-4223
Facsimile: ++64-9-274-4224
E-mail: filtec@filtec.co.nz
Web Site: www.filtec.co.nz

SPECIFICATIONS



PRESSURE SAND FILTERS:

Design Capacity	: 70 m ³ /hr per filter
Filtration Rate	: 4.3 LPS/m ²
Backwash Flow	: 90-100 m ³ /hr
Air Scour	: 4.5 m ³ /min
No. of vessels	: 2
Diameter/Shell Height	: 2420 mm (O/D) / 1220 mm
Design Pressure/Temperature	: 5.5 bar (g) / 50°C
Material of Construction	: Carbon steel, epoxy coated
Media/Depth	: Sand, 0.6 to 1.2 mm / 600 mm dry loading
Air Blower	: 273 m ³ /hr @ 300 m bar

DEMINEALISER OPERATION:

Flow Rate	50m ³ /hr per stream
No. of Streams	2
Normal Service Cycle Time	18 hrs each
Regeneration Duration	2 hrs approx
Total Throughput between Regeneration's	900m ³
Control System	PLC

SERVICES:

Raw Water Inlet (to inlet tank)	100m ³ /hr @ >1.2 Bar
Compressed Air	6 Bar
Deminealised Water for Regeneration	10.5 m ³ /hr @ 3 Bar for 30 min

PREFILTER SYSTEM:

Inlet Balance Tank	7500 L Polyethylene
Prefilter	Cuno 12NDC4 316 SS housing, 10 Bar
Filters	Cuno Microklean G78C8-4, 10 micron
Inlet Pump	Grundfos CRN64-2-2 vertical SS

DEMINEALISER VESSELS:

Diameter	1220 mm
Length of Straight Shell	1490 mm, 1680mm
Construction Material	Carbon steel, epoxy coated
Design Pressure	4 Bar
Regeneration Method	Counter current
Resin Type/Manufacturer	Amberjet [®] 1200H, 4200CL, Rohm and Haas
Regenerant/Concentration	Hydrochloric Acid 5%, Sodium Hydroxide 3%

DEGAS TOWER:

Rated Throughput	50m ³ /hr
Air Blower	IPSCO GI 125, 1185m ³ /hr @ 100 w.g
Degassed Water Tank	3000 litre polyethylene
Transfer Pump	Grundfos CRN 64-2-2 vertical SS

REGENERATION PLANT:

Acid Day Tank	465L, FRP
Caustic Day Tank	240L, 304SS
Hot Water Mixing System	TD-G, three port SS mixing control valve with ceramic seals. PT100 and PID control
Bulk Acid Transfer Pump	Wilden P1/PP/TF Air Diaphragm Pump
Bulk Caustic Transfer Pump	Wilden P1/PP/WF Air Diaphragm Pump
Acid Dose Pump	Wallace & Tiernan Encore 700
Caustic Dose Pump	Wallace & Tiernan Encore 700

CLIENT	: NZMP, Clandeboye
CLIENT'S REPRESENTATIVE	: Process Developments NZ Ltd
PROCESS DESIGN	: Filtration Technology Ltd
NZ BUILDER'S	: Filtration Technology Ltd
PROJECT MANAGER	: Filtration Technology Ltd
SUB CONTRACTS	: Mechanical – Site Services Ltd, Timaru
	: Electrical – Industrial Controls South Canterbury Ltd
	: PLC – Industrial Controls South Canterbury Ltd
	: Tanks – Service Engineers, Auckland





PROJECT DESCRIPTION

The project comprised building two new sand filters, two streams of demineralised water plant and modifications to existing acid and caustic regeneration system. The work also included modifications of existing pipe work and integration of the new filtered water supply with existing demineraliser plants.

The two pressure sand filters filter raw water from an existing bore, and supply to existing demin water plant 2, and to new plants, 3&4 An inlet balance tank to store filtered water and set of pumps to supply water to new demin plant 3&4 were installed.

Each sand filter was designed for 70 m³/hr capacity and each stream of new demineralised water plant (stream 3&4) were designed for 50 m³/hr capacity to enable optimum throughput.

THE AMBERPACK® SYSTEM

This AMBERPACK® plant is unique in that it uses Rohm and Haas licensed design criteria, giving a packed resin bed plant with superior flow and ion exchange characteristics to conventional style demineraliser plants.

The resins used in the plant are Rohm and Haas Amberjet® uniform bead size resins, which contribute to the performance of the plant.

Some of the major benefits of this style of demineraliser plants are:

- Smaller exchange vessel sizes giving reduced capital cost and smaller footprint.
- Specially engineered flow characteristics within the vessels to give very efficient exchange and regeneration cycles.
- Lower regeneration chemical usage gives lower running costs.
- Rapid rinse down to set point conductivity means shorter regeneration cycle time - shorter time off line.

The AMBERPACK® demineralisation plant is controlled by a purpose designed computer programme running in conjunction with Clandeboye's WPC control system. A full graphics screen interface is used enabling all functions of the plant to be controlled by the operator from the control centre