

SEPARATION TECHNOLOGIES

ION EXCHANGE RESINS

DUOLITE C 20 C

PRODUCT DATA SHEET.



DESCRIPTION

Duolite C 20 C is gel type strongly acidic Cation Exchange Resin of the sulphonated polystyrene type. It can be used for softening (in Na⁺ form) as well as for water demineralisation and other chemical process (in H⁺ form). Its principal characteristics are excellent physical, chemical and thermal stability, good ion exchange kinetics and high exchange capacity. The physical & chemical properties are tested by the method specified in IS : 7330-1988.

PROPERTIES

Matrix _____	Styrene divinylbenzene copolymer
Functional groups _____	Sulphonates.
Physical form _____	Amber beads.
Ionic form as supplied _____	Sodium (See available grades also)
Total exchange capacity _____	2 eq / L (Na ⁺ form)
Moisture holding capacity _____	43 - 47 % (Na ⁺ form)
Specific gravity _____	About 1.28 (Na ⁺ form)
Packing density _____	800 - 840 gm / L (Na ⁺ form)
Particle size _____	0.4 - 1.20 mm (See available grades also)
Maximum reversible swelling _____	Na ⁺ Ⓡ H ⁺ : About 8 %
	Ca ⁺⁺ Ⓡ Na ⁺ : 4%
Operating pH range _____	0 - 14
Chemical stability _____	Insoluble in dilute acids or bases and common solvents.

Please refer our Technical Data Sheet on Duolite storage and handling instructions for storage of resin.

SUGGESTED OPERATING CONDITIONS

Maximum operating temperature _____	120°C
Minimum bed depth _____	700 mm
Service flow rate _____	5 to 40 BV*/hr
Maximum linear velocity _____	50 m /hr
Regenerant _____	HCl H ₂ SO ₄ NaCl
Level _____	30 to 150 g /L 40 to 240 g/L 50 to 250 g /L
Flow rate _____	2 to 5 BV / hr 2 to 10 BV / hr 2 to 8 BV / hr
Concentration _____	5 to 8% 0.7 to 6 % 8 to 12 %
Minimum contact time _____	30 minutes
Slow rinse _____	Minimum 2 BV at regeneration flow rate
Fast rinse _____	Same as service flow rate.

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin

Please refer the check list provided for safe operation and longer durability of resin.

AVOID OXIDATION OF DUOLITE IER FOR LONG & HEALTHY LIFE

AVAILABLE GRADES

Name	Ionic form	Particle* size mm	Applications
C - 20	Na ⁺	0.3 - 1.2	Softening and standard demineralisation process with co-flow regeneration.
C 20 A	Na ⁺	0.4 - 1.2	Special grade for softening process
C 20 D	H ⁺	0.6 - 1.2	For Duobed (stratified bed) operation.
C 20 L	Na ⁺	0.5 - 1.2	For use at high flow rates with minimum pressure loss
C 20 LF	H ⁺	0.4 - 1.0	For floating bed and packed bed operation
C 20 MB	H ⁺	0.4 - 1.2	For mixed bed operation, also recommended for demineralisation with reverse flow regeneration
C 20 TR	H ⁺	0.7 - 1.2	For Triobed operation.
C 20 MONOSPHERE	H ⁺	0.6 - 0.8	For high performance MB`s

* 90% OF THE BEADS WITHIN THE SPECIFIED RANGE

OPERATING CYCLE

Softening as well as demineralisation is usually a four- step operation ; service backwash, regeneration and rinse.

SERVICE

During this stage, the raw water passes through the resin bed typical 0.7 to 1.8 m deep. In softening, the calcium and magnesium ions are replaced by sodium ions. The hardness leakage is usually less than 1% of the hardness of the feed water. In demineralisation, the resin exchanges all the cations from the water for an equivalent quantity of H⁺ ions. The ion leakage (generally Na⁺) depends on regeneration level, total salinity, sodium and alkalinity content. These factors also determine the operating capacity.

BACKWASH

The resin bed is decompacted during 5 to 15 minutes with an upward flow of water. The backwash flow rate must be adjusted to get an expansion of at least 50% (see fig.1). When using upflow regeneration, the resin needs only be backwashed every 20 to 50 cycles and this backwash is followed by a double regeneration.

REGENERATION

We recommend to maintain a minimum contact time of 30 minutes with the regenerant (salt solution for softening - hydrochloric or sulphuric acid for demineralisation). Flow rates and concentrations are given in table of operating conditions in page 1. With sulphuric acid, it is necessary to adjust the concentration as a function of the hardness to avoid the precipitation of calcium sulphate.

RINSE

It is carried out in two stages :

- Displacement rinse, in which the excess regenerant and reaction products are flushed away and the regeneration process completed.
- Fast rinse which removes remaining traces of reaction products.

PERFORMANCE

The operating capacity depends on several factors such as the water analysis and the level of regeneration. The data to calculate the operating capacity and the ionic leakage with co-flow and counter flow regeneration are given in the Engineering Data Sheets.

HYDRAULIC CHARACTERISTICS

Figure 1 shows the bed expansion of standard Duolite C 20 C as a function of backwash flow rate and temperature.

Figure 2 shows the pressure drop data for standard Duolite C 20 C as a function of service flow rate and water temperature. Pressure drop data are valid at the start of the service run with a clear water influent and correctly classified bed.

Figure 1

BED EXPANSION

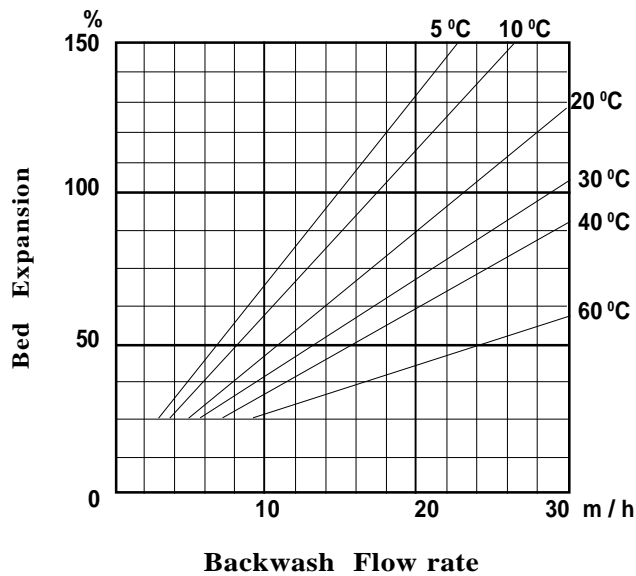
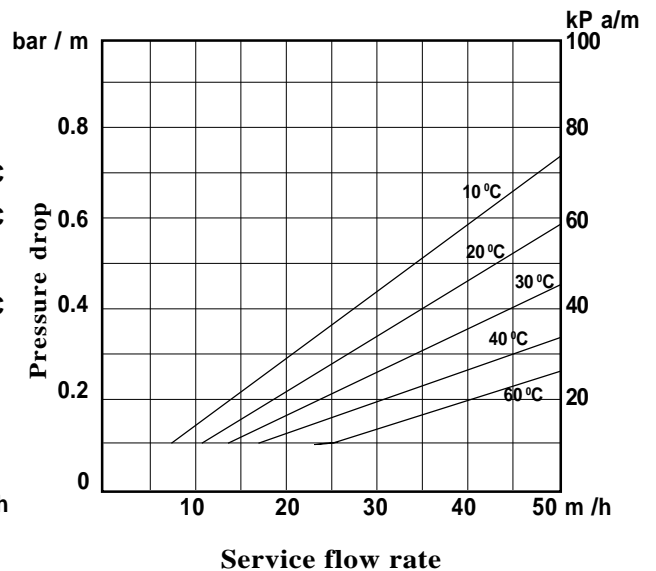


Figure 2

PRESSURE DROP*



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PRODUCT DATA SHEET.

For further information please contact your nearest Auchtel Sales office

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SAFE USE INFORMATION

A Material Safety Data Sheet is available for each product. To obtain a copy contact your Auchtel representative.

CAUTION

Acidic and basic regenerant solutions are corrosive and should be handled in a manner that will prevent eye and skin contact. Nitric acid and other strong oxidizing agents can cause explosive type reactions when mixed with Ion Exchange Resins. Proper design of process equipment to prevent rapid buildup of pressure is necessary if use of an oxidizing agent such as nitric acid is contemplated. Before using strong oxidizing agents in contact with Ion Exchange Resins, consult sources knowledgeable in the handling of these materials.

The suggestions and data in this bulletin are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale. The Company maintains a policy of continuous development and reserve the right to amend any specification without notice. DUOLITE is a trademark of Rohm and Hass Company, Philadelphia, U.S.A. and Auchtel Products Ltd. are users of the same in India.

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