

Technical Data

D301 Macroporous Weak Base Anion Exchange Resin

PRODUCT DESCRIPTION

D301 Macroporous Weak Base Anion Exchange Resin is a macroporous polystyrenic weak base anion resin having tertiary amine functionality. **D301** is designed to exhibit high operating capacity in removing strong acids formed after decationizing water through a strong acid cation resin like **001×7 Strong Acid Cation Exchange Resin**.

Because of its special porosity characteristics **D301** shows excellent properties for removal of naturally occurring organic species from waters along with superior elution efficiency of the organics during regeneration.

D301 also shows excellent resistance to osmotic shock as well as being physically resistant to mechanical breakage. Regeneration with caustic soda requires only 125% of the stoichiometric equivalent when related to the ionic loading on the resin at the exhaustion point. The rinse characteristics are good and minimum volumes of decationized water are required to rinse down to a conductivity of 50 μS/cm.

Typical Physical & Chemical Characteristics

Polymer Matrix Structure	Crosslinked Styrene-DVB Macroporous structure
Physical Form and Appearance	Hard Spherical Opaque Beads
Functional Groups	Weak base tertiary amine $R-N(CH_3)_3^+$
Ionic Form, as shipped	Free Base
Shipping Weight Free Base form	650-720 g/l
Particle Size Range	315mm-1200 mm \geq 95%
Moisture Retention	48 - 58%
Uniformity Coefficient	1.6 max
Reversible Swelling FB→Cl-	20% max.
Specific Gravity, Free Base form	1.03-1.06
Total Exchange Capacity	1.45 eq/l min.
Operating Temperature, Free Base form	100°C max.
pH Range, Stability	0 - 14

Standard Operating Conditions

Operation	Rate	Solution	Minutes	Amount
Service	8 - 40 BV/h	Effluent from Cation Exchange	as per design	as per design
Backwash	5 - 7 m/h	Influent water 4° - 25°C	5 - 20	1.5 - 4 BV
Regeneration	4 BV/h	2 - 4% NaOH	30	NaOH 32 - 96g /l
Rinse, (slow)	4 BV/h	Decationized water	20	1 - 5 BV
Rinse, (fast)	16 BV/h	Decationized water	15	4 BV
Backwash Expansion 35% to 50% Design Rising Space 75%				

OPERATIONAL PROPERTIES

D301 is supplied in the fully regenerated form to be put into service immediately. We recommend, however, that the resin be backwashed to prevent channeling or pressure loss. A backwash expansion of 35 to 50% would be adequate. When **D301** is followed by a strong base resin, all or a portion of the regenerant can be used to regenerate the weak base resin.

We recommend that this procedure be reviewed with us so that we can determine whether enough caustic is available to completely regenerate **D301**.

MINIMUM REGENERATION LEVELS FOR ALL REGENERANTS

	Regeneration Levels		Regeneration Concentration %
	g/l	lbs/ft ³	
NaOH	44.8	2.8	2.4
NH ₃	20.8	1.3	2.0
Na ₂ CO ₃	60.8	3.8	5.0

DETERMINATION OF CAPACITY

Multiply Base Operating Capacity (Fig. 1) by Flowrate Correction Factor (Table 1)
Table 1

Flowrate Correction Factor

Flowrate, m/h	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25
Correction Factor	1.1	1.0	0.93	0.88	0.84	0.81	0.77	0.75	0.73	0.70

Fig. 1 OPERATING CAPACITY

INFLUENT 500 ppm HCl as CaCO₃
 BED DEPTH - 600 mm

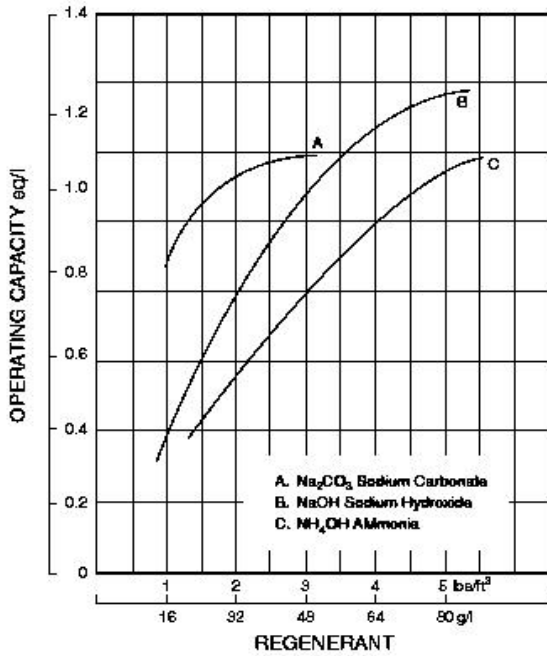


Fig. 2 PRESSURE LOSS CHARACTERISTICS

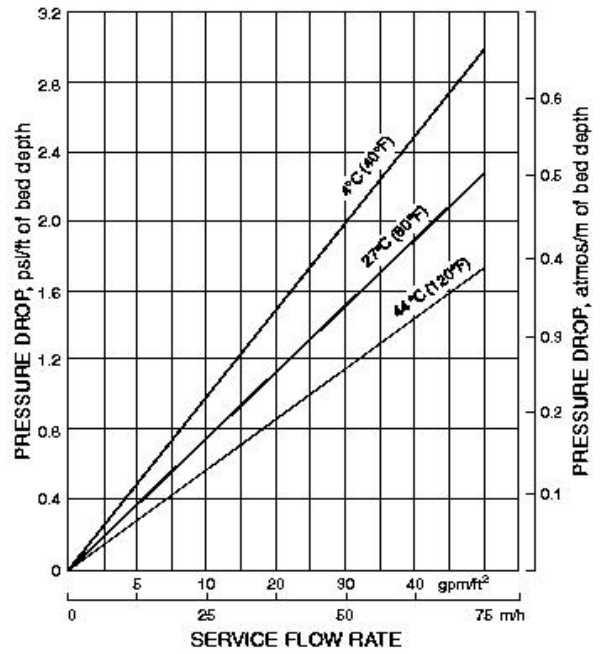
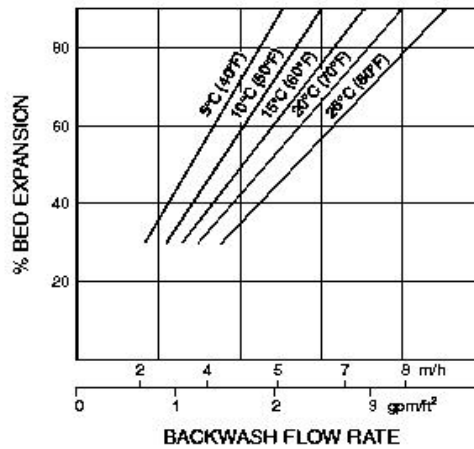


Fig. 3 BACKWASH BED EXPANSION

AT DIFFERENT FLOW RATES AND TEMPERATURES



Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

D301 Macroporous Weak Base Anion Exchange Resin

Supplier

Shengdong Technology Co., LTD.
No. 88 Zhuhu Road, Tianchang, Anhui Province, China 239300

For non-emergency information contact: 0086-550-7322555

Emergency telephone number

Spill Emergency	0086-550-7322555
Health Emergency	0086-550-7322555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Polyvinyl benzyl Tertiary Amine	Not Hazardous	42.0 - 52.0%
Water	7732-18-5	48.0 - 58.0%

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form Beads
Colour white

Hazard Summary

CAUTION!

MAY CAUSE EYE/SKIN IRRITATION.

Potential Health Effects

Primary Routes of Entry:	Skin contact Eye contact
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Eyes: Direct contact with material can cause the following:
slight irritation

Skin: Prolonged or repeated skin contact can cause the following:
slight irritation

4. FIRST AID MEASURES

Skin contact: Wash off with soap and water. If skin irritation persists, call a physician.

Eye contact: Rinse with plenty of water. If eye irritation persists, consult a specialist.

5. FIRE-FIGHTING MEASURES

Flash point	not applicable
Ignition temperature	ca.500.0 °C
Suitable extinguishing media:	Use the following extinguishing media when fighting fires involving this material:
	water spray
	carbon dioxide (CO ₂)
	foam
	dry chemical

Specific hazards during fire fighting: Toxic fumes are generated when material is exposed to fire or fire conditions. Cool closed containers exposed to fire with water spray.

Special protective equipment for fire-fighters: In the event of fire, wear self-contained breathing apparatus.

Further information: Remain upwind.
Avoid breathing smoke.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations.

If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.

Methods for cleaning up

Keep spectators away.

Floor may be slippery; use care to avoid falling.

Transfer spilled material to suitable containers for recovery or disposal.

7. Handling and storage

Handling

NOTE: This product as supplied is a whole bead resin and may produce slight eye irritation. However, the ground form of this resin should be treated as a severe eye irritant. Worker exposure to ground resins can be controlled with local exhaust ventilation at the point of dust generation, or use of suitable personal protective equipment (dust/mist air-purifying respirator and safety goggles). Avoid repeated freeze-thaw cycles; beads may fracture. If frozen, thaw at room temperature. Properly designed equipment is vital if these resins are to be used in conjunction with strong oxidizing agents such as nitric acid to prevent a rapid build-up of pressure and possible explosion. Consult a source knowledgeable in the handling of these materials before proceeding.

Storage

Further information:

CAUTION: Do not pack column with dry ion exchange resins. Dry beads expand when wetted; this expansion can cause glass column to shatter.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

Eye protection: Use safety glasses with side shields (ANSI Z87.1 or approved equivalent).

Hand protection: Cotton or canvas gloves.

Respiratory protection: No personal respiratory protective equipment normally required.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility.

Engineering measures: None required under normal operating conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Beads
Colour	white Opaque Beads
Boiling point/range	No data available
Melting point/range	No data available
Flash point	not applicable
Ignition temperature	ca.500 °C
Vapour pressure	17.0 mmHg at20 °C Water
Water solubility	practically insoluble
Relative density	1.06
Viscosity, dynamic	not applicable
Viscosity, dynamic	not applicable
Evaporation rate	<1.00
Percent volatility	48 -58 % water

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions

Stable under normal conditions.

Materials to avoid

Avoid contact with the following: Strong Oxidizers nitric acid

Hazardous decomposition products

Thermal decomposition may yield the following:, monomer vapors,

11. TOXICOLOGICAL INFORMATION

No data are available for this material. The information shown is based on profiles of compositionally similar materials.

Acute oral toxicity LD50rat > 5,000 mg/kg

Acute dermal toxicity LD50rabbit > 5,000 mg/kg

12. ECOLOGICAL INFORMATION

Chemical Fate

Biochemical Oxygen Demand (BOD) No data available

13. DISPOSAL CONSIDERATIONS

Disposal

Waste Classification: When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).

Unused material may be incinerated or landfilled in facilities meeting local, state, and federal regulations.

Contaminated packaging: Empty containers should be taken to local recyclers for disposal. Refer to applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

IMO/IMDG

Not regulated (Not dangerous for transport)

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification

This product is considered non-hazardous under the OSHA Hazard Communication Standard (29CFR1910.1200).

This product is not a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.

SARA TITLE III: Section 313 Information (40CFR372)

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

CERCLA Information(40CFR302.4)

Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.

US. Toxic Substances Control Act (TSCA) All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

Pennsylvania

Any material listed as "Not Hazardous" in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

16. OTHER INFORMATION

Hazard Rating

	Health	Fire	Reactivity
HMIS	1	1	0

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAC	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.