



Marine Catalyst

For Residual Fuel

Product Description Sheet

Technol Marine Catalyst is a premium Residual Fuel improver that increases fuel combustibility, enabling a higher BTU output. Smoke and soot emissions are reduced along with erosive slag deposits. Resulting in increased fuel and boiler efficiency, and extending component service life, decreasing maintenance intervals, costs, and downtime.

Combustion Improvement - extends the carbon burnout reaction to lower flue gas temperatures and speeds up the rate of reaction reducing the carbon present in the flyash, which actively reduces exhaust plume opacity, particulate matter, and carbon in the flue gas. Electrostatic Precipitator (ESP) operation is also improved.

Slag - trace metals of Vanadium, Sodium, and Sulfur that are oxidized and melted during the combustion process along with unburned carbon, deposit themselves on boiler tubes and surfaces. This leads to efficiency loss due to poor heat transfer and tube corrosion, major sources of maintenance, costs, and downtime.

Technol Marine Catalyst raises the melting point of these metals above combustion temperatures, causing them to remain a solid, therefore not being

deposited on boiler tubes and inner boiler surfaces.

Corrosion - Vanadium and Sulfur, the main corrosive trace metals inherent with heavy fuels, does not catalyze into acidic/ erosive slag deposits that foul backend equipment.

Technol Marine Catalyst provides unique, customized, multifunctional solutions to:

- Improve Combustion
- Allow emission reduction
- Provide operational flexibility
- Improve profitability
- Reduce maintenance and downtime

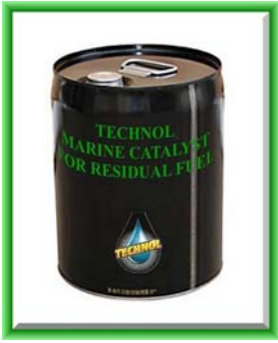
APPLICATION INSTRUCTIONS

Apply 1 gal. to 5,000 gal. of fuel before refueling to ensure faster mixing and distribution. Harmful if swallowed.

Technol Marine Catalyst is available in:

- 5-Gal. Closed-Head Steel Pails
- 54-Gal Closed-Head Steel Drums
- 275- & 330-Gal. Tote Bins

For more information, please contact your Technol representative.



Marine Residual Fuel Combustion Catalyst

Features & Benefits

- Lowers Carbon-In-Ash (CIA) and improves boiler and fuel efficiency
- Lowers opacity yielding lower Particulate Matter (PM)
- Improves Electrostatic Precipitator (ESP) operation
- Reduces acid dew point and ash disposal costs
- Changes slag morphology
- Cleans tubes and surfaces and improves heat transfer
- Reduces fan requirements and hot-side corrosion
- Reduces maintenance
- Reduces Vanadium Pentoxide (V_2O_5) formation
- Inhibits oxidation of Sulfur Dioxide (SO_2) to Sulfur Trioxide (SO_3)
- Reduces cold-side corrosion and acid slime

Used by and in:

**▲ Maritime Fleets ▲ Charter & Pleasure Boat Owners ▲
▲ Dockside Marine Fueling Depots ▲ Fuel Cleaning Services ▲**



Marine Catalyst For Residual Fuel

Technical Data Sheet

Combustion Improvement - provides for a more complete fuel burn which increases BTU output while using the same amount of fuel. Results are a reduction the amount of Carbon-In-Ash (CIA), Particulate Matter (PM), and carbon in the flue gas. Leading to reduced exhaust plume opacity, improved Electrostatic Precipitator (ESP) operation, and less backend deposits.

Corrosive Slag - During the combustion process Vanadium normally forms Vanadium Pentoxide (V_2O_5) which leads to the formation of liquid corrosive slag and catalyzes the oxidation of Sulfur Dioxide (SO_2) into Sulfur Trioxide (SO_3). When SO_3 mixes with moisture from the atmosphere or from leaking boiler tubes it forms corrosive sulfuric acid. Using [Technol Marine Catalyst For Residual Fuel](#) converts Vanadium into high melting point oxides of Vanadium trioxide (V_2O_3) and Vanadium tetroxide (V_2O_4). The presence of these lower oxides do not catalyze the oxidation of SO_2 into SO_3 , so less corrosive's are produced.

Reducing excess air in the system will allow you to further drive oxidation of Vanadium to its lower oxidative state (V_2O_3 and V_2O_4) without sacrificing combustion or efficiency. Sulfur forms SO_2 during combustion. SO_2 can be oxidized into SO_3 in the presents of V_2O_5 catalysts, which [Technol Marine Catalyst For Residual Fuel](#) also reduces. SO_3 reacts with water to form Sulfuric Acid (H_2SO_4) which is very corrosive to metal surfaces. The active ingredient Iron (Mn) will

convert the Iron Oxide $Fe(III)_2O_3$ to $Fe(II)_3O_4$ which will not catalyze SO_2 into SO_3 .

Reduced SO_3 results in a lower acid dew point. This prevents the formation of corrosive H_2SO_4 on air heaters, ESP and colder metal parts. The presence of free acid also results in sticky deposits which prevent efficient operation of back end equipment.

[Technol Marine Catalyst For Residual Fuel:](#)

- Increases fuel and boiler efficiency
- Cleans boiler heat transfer surfaces
- Reduced emissions & soot blowing
- Reduced atomizing steam
- Reduced cold-end deposits, corrosion.

APPLICATION INSTRUCTIONS:

Apply 1 gal. to 5,000 gal. of fuel before refueling to ensure proper mixing and distribution.

[Technol Marine Catalyst For Residual Fuel](#) is readily available in:

5-Gal. Closed-Head Steel Pails

54-Gal. Closed-Head Steel Drums

Skid-mounted 275- & 330-Gal. Tote Bins for industrial or bulk applications.



Marine Catalyst For Residual Fuel

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Rules & Regulations
 Revision: 10/19/2015 Issued: 06/01/2006 Supersedes: 08/01/2014

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT FORM: Liquid Substance
 TRADE NAME: **TECHNOL MARINE CATALYST FOR RESIDUAL FUEL**
 CHEMICAL NAME: Proprietary mixture of petroleum distillates
 COMPANY: Technol Fuel Conditioners, Inc.
 145 Wyckoff Road
 Eatontown, NJ 07724
 Phone: 1.800.645.4033

EPA REGISTRATION: NONE - Not designed for On-Road Fuel Consumption
 EMERGENCY PHONE: Chemtrec: 1.800.424.9300 - within USA and Canada
 Chemtrec: 1.703.527.3887 - outside USA and Canada

SECTION 2. HAZARDS IDENTIFICATION

GHS SIGNAL WORD: **WARNING!**

GHS HAZARD PICTOGRAMS:



GHS CLASSIFICATIONS:

PHYSICAL: H227: Combustible liquid
 HEALTH: H302: Harmful if swallowed
 H312: Harmful in contact with skin
 H320: Can cause eye irritation
 H336: May cause drowsiness or dizziness
 H373: May cause damage to organs through prolonged or repeated exposure
 ENVIRONMENTAL: H402: Harmful to aquatic life

GHS PRECAUTIONARY STATEMENTS:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P233: Keep container tightly closed.
 P261: Avoid breathing dust/fumes/gas/mist/vapors/spray [As modified by IV ATP].
 P262: Do not get in eyes, on skin, or on clothing.
 P273: Avoid release into the environment.
 P301+P331: IF SWALLOWED, Do NOT induce vomiting.
 P410+P411: Protect from sunlight. Store at temperatures between 45°F [7.2°C] and 85°F [29.4°C].

SECTION 3. COMPOSITION AND INGREDIENTS INFORMATION

Chemical Name	Hazard Date	% By Weight	CAS Number	SARA 311	SARA 312	SARA 313
Aromatic Naphtha	Not Available	18% - 32%	64742-94-5	No	No	No
Glycol Ether	August, 1992	6% - 12%	111-76-2	No	No	Yes



Marine Catalyst For Residual Fuel

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Rules & Regulations

Revision: 10/19/2015 Issued: 06/01/2006 Supersedes: 08/01/2014

SECTION 4. FIRST AID MEASURES

- INHALATION:** Overexposure can cause dizziness, lack of coordination, and breathing complications, unlikely to occur under normal usage conditions. Handlers should always wear a self-contained breathing apparatus in the positive mode with a full face-piece due to the likelihood of fumes, smoke, and hazardous component decomposition. Remove to fresh air and deploy artificial respiration if not breathing. Get medical attention.
- SKIN CONTACT:** Can cause irritation of exposed skin due to defatting of skin tissue. Handlers should always wear rubber gloves. Wash exposed skin vigorously with general soap and water. Get medical attention if skin irritation persists.
- EYE CONTACT:** Can cause irritation of exposed eye tissue. Handlers should always wear splash-proof goggles. Rinse eyes with cool flowing water for at least 15 minutes and get immediate medical attention.
- INGESTION:** Can cause irritation of the gastrointestinal tract and possible fatal kidney liver damage. DO NOT INDUCE VOMITING. Deploy artificial respiration if not breathing. Get immediate medical attention.

SECTION 5. FIREFIGHTING MEASURES

Special Hazards and Procedures:

This product poses no unusual fire fighting problems. It will burn if involved in a fire. Oxides of sulfur (SO₂) will be given off while burning. Combustion may produce oxides of carbon and oxides of calcium. Water may be used to cool fire-exposed containers and structures but is not a suitable extinguishing media.

Protective Equipment:

As in any fire, firefighters must be equipped to prevent breathing of vapors or products of combustion. Wear an approved self-contained goggled breathing apparatus, protective gloves and clothing.

Extinguishing Media:

Dry chemical, CO₂ and foam are suitable. Water jets or any water-based fluid are not suitable. Closed containers may be cooled with water. Treat large fires as an oil fire. Oil will float on water and can cause fire to spread. Heat from fire can generate flammable vapor.

SECTION 6. ACCIDENTAL RELEASE PRECAUTIONS

- PERSONAL:** Wearing suitable protective equipment, eliminate sources of ignition and open nearby windows to ventilate the problem area.
- ENVIRONMENTAL:** Product has very low solubility in water. Prevent from entering sewer system, surface water or soil.
- FOR SPILL CLEAN-UP:** Shut off leak and dike up large spills. Absorb with an inert material such as sand, soil or vermiculite. Sweep up absorbent and dispose in accordance with regulatory requirements.

SECTION 7. PRODUCT HANDLING & STORAGE

- HANDLING:** This product is best stored in its original container. Steel or HDPE containers are recommended replacements and electrically bond and ground all containers and equipment. Avoid contact with eyes, skin and clothing. Avoid breathing vapors, aerosol and mists. Use with adequate ventilation and wash thoroughly after handling. Never use pressure to empty drums.
- STORAGE:** Full or partially-filled containers should always be kept upright and away from strong oxidizing agents. This product will pump down to 10°F [-12.2°C]. Nonetheless, it is recommended that full or partially-filled containers be stored in a cool dry place between 45° - 85°F [7.2° - 29.4°C]. Store in original container if possible, and keep all chemical containers away from direct sunlight and tightly closed when not in use.



Marine Catalyst For Residual Fuel

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Rules & Regulations
Revision: 10/19/2015 Issued: 06/01/2006 Supersedes: 08/01/2014

SECTION 8. EXPOSURE CONTROL/PERSONAL PROTECTION

VENTILATION: None normally required. Use additional ventilation if needed to control vapor concentrations particularly if a mist is generated or fumes from hot material are present.

RESPIRATORY: None required if area adequately ventilated. Use appropriate respiratory protection if used in confined areas. If used in an application where a mist may be generated, observe a TWA/PEL of 5 mg/m³ (OSHA, ACGIH) for a mineral oil mist. Use a respirator with dual organic vapor/mist and particulates cartridge if vapor concentration exceeds permissible exposure limit.

SKIN PROTECTION: Use neoprene-type gloves and apron.

EYE PROTECTION: Wear chemical safety goggles or a full-plate face shield. Contact lenses should not be worn.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

Appearance:	Orange Liquid	Odor:	Aromatic Hydrocarbon
Boiling Point:	Not Established	Density at 20°C (gm/cm ³):	0.90 Typical
Vapor Pressure @ 25°C:	0.19 (mm Hg)	Vapor density (Air = 1):	Not Established
Solubility in Water:	Insoluble in cold water	Solubility in Organic Solvents:	Soluble
pH:	Not Applicable	Flash point, COC (ASTM D-93):	143°F
Pounds per Gallon:	7.5	Evaporation Rate (Butyl Acetate =1):	Not Established
Freeze Point:	10°F (-12.2°C)	Volatiles By Volume @ 68°F (20°C):	Not Established

SECTION 10. STABILITY AND REACTIVITY

This product is stable and not subject to hazardous polymerization.

Hazardous Decomposition Products: Oxides of carbon (carbon monoxide and carbon dioxide), oxides of hydrogen (contaminated and hazardous water), and oxides of Nitrogen can occur when exposed to heat at 350°F (176.7°C).

Incompatible materials: Strong oxidizers such as hydrogen peroxide, oxidizing chlorine, and bromine compounds (e.g. chlorine bleach) and chromic acid should be avoided.

Conditions to avoid: Extreme heat and sources of fire or ignition.

SECTION 11. TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE: Eye contact, skin contact, inhalation of vapors, and ingestion.

ACUTE TOXICITY: The handling procedures and safety precautions in this SDS should be followed to minimize employee exposure.

CHRONIC EFFECTS: Can cause eye, skin and gastrointestinal irritation. Irritation of tissue, defatting of skin, gastrointestinal irritation, Kidney and Liver damage.

SYMPTOMS: Irritation of exposed tissue and organs, blurriness of vision, dizziness, fainting, and lack of physical coordination.

LD50: 10 ml/kg (Rats)

NTP/IARC/OSHA: This product and none of its components are listed as a carcinogens, mutagens, or teratogens.

SECTION 12. ECOLOGICAL INFORMATION

No specific aquatic data is available. This product should be kept away from all bodies of water, and prevented from entering sewer streams. It may be necessary to extract soil where large spills have occurred. No specific Bioaccumulation data is available. No specific Terrain Migration data is available.



Marine Catalyst For Residual Fuel

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Rules & Regulations
 Revision: 10/19/2015 Issued: 06/01/2006 Supersedes: 08/01/2014

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: This product should be incinerated as a waste oil, at a certified and registered waste disposal site, in compliance with all federal, state and local regulations and requirements.

RCRA STATUS OF UNUSED PRODUCT: Dispose of this product in permitted hazardous wastes sites. Keep this product away lakes, streams, rivers ponds, sewer systems, and any other body of water.

SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN/NA Number	Proper Shipping Name	Classes	Packing Group	Label	Additional Information
DOT Classification	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	Placard: Poison
TDG Classification	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	
ADR/RID Class	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	
IMDG Classification	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	
IATA-DGR Class	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	
IBC Classification	UN2810	Toxic Org. Liquid, NOS	6.1	I	Poison	

All Transportation Methods:

Keep packages and containers upright and tightly sealed at all time during transportation. Do not expose packages and containers to direct sunlight, extreme heat, or any source of ignition. All product should be transported in their original packaging and containers. Rubber, plastic or other lined containers should not be used.

SECTION 15. REGULATORY INFORMATION

US Toxic Substance Control Act (TSCA): All components are listed or exempted.

SARA 302/304: No components were found.

SARA 311/312 YES - Health, Physical

SARA 313 YES - 1,2,4-Trimethylbenzene, Naphthalene

State Regulations:

- Massachusetts: None of the components are listed.
- New York: None of the components are listed.
- New Jersey: None of the components are listed.
- Pennsylvania: None of the components are listed.
- California Prop. 65: **WARNING:** This product contains ingredients known to the State of California to cause cancer: Naphthalene, Benzene

National Fire Protection Association: Health = 2 Flammability = 2 Reactivity = 2

Europe Inventory: At least one component is not listed in EINECS but all such components are listed in ELINCS.

Canada Inventory:

Iron	CAS# 12108-13-3	60% - 100%	Canadian Disclosure Regulation
1,2,4-Trimethylbenzene	CAS# 95-63-6	1% - 4.9%	Canadian Disclosure Regulation
Naphthalene	CAS# 91-20-3	1% - 4.9%	Canadian Disclosure Regulation

Australia Inventory: Not Determined.

China Inventory: Not Determined.

Japan Inventory: Not Determined.

Korea Inventory: Not Determined.

Philippines Inventory: Not Determined.



Marine Catalyst For Residual Fuel

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Rules & Regulations

Revision: 10/19/2015 Issued: 06/01/2006 Supersedes: 08/01/2014

SECTION 16.

OTHER INFORMATION

This product has not been tested in long term, chronic exposure, therefore, the handling procedures and safety precautions in the SDS should be followed to minimize employee exposure.

Label Information for the United States: CAUTION: May cause skin and eye irritation. Do not swallow. Avoid eye and skin contact. Wash thoroughly after handling. Avoid contact with clothing. Wash clothing before reuse. Keep out of reach of children. Keep containers tightly closed when not in use. Avoid breathing mists or sprays of this product or its solutions.

EMPLOYER RESPONSIBILITY

Employers must ensure that these Material Safety Data Sheets are readily accessible and available to all their employees responsible for the storage, handling, and manipulation of this product. This can be done in many ways, such as organizing all chemicals SDS in freely available binders kept in areas where the chemicals are stored, or on computers the handling employees have access to without the inconvenience of leaving the work or storage area. We strongly recommend the binder method which keeps them available in the event of a power outage or other emergency inhibiting computer use. Employers may want to consider designating two persons (primary and backup) responsible for obtaining and maintaining SDS records. If the employer does not have a particular SDS for a chemical commodity, the employer or responsible designate should contact the chemical manufacturer to obtain one prior to product use.

REFERENCES

OSHA, 29 CR 1910.1200(g) and Appendix D.

United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 3rd Revised Edition, United Nations, 2009. These references and other information related to the revised Hazard Communication Standard can be found on OSHA's Hazard Communication Safety and Health Topics web site at: <http://www.osha.gov/dsg/hazcom/index.html>.

DISCLAIMER

This brief provides a general overview of the Material Safety Data Sheet requirements as mandated by the Hazard Communication Standard 29 CFR 1910.1200(g) and Appendix D of 29 CFR 1910.1200. It does not alter or determine compliance responsibilities in the standard or the Occupational Safety and Health Act of 1970. Since interpretations and enforcement policy may change over time, the reader should consult current OSHA interpretations, decisions by the Occupational Safety and Health Review Commission, and the courts for additional guidance on OSHA compliance requirement. Please note that states with OSHA-approved state plans may have additional requirements for chemical safety data sheets, outside of those outlined above. For more information on those standards, please visit: <http://www.osha.gov/dcspp/osp/statestandards.html>.

The information contained in this document has been derived from analysis of published data freely available and supplied components. While the recommendations contained herein are offered in good faith and believed to be accurate and correct as of the date hereof, manufacturer makes no warranty, expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature regarding this data or the results to be obtained from use thereof. In no event will the manufacturer be liable or responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.



Marine Catalyst For Residual Fuel Application Chart

This chart indicates the availability of container sizes and specifies the ounces or gallons of product needed for the amount of fuel to be conditioned. Container quantities have been maximized in accordance with skid dimensions. Please see the **Packaging & Shipping** notation at the bottom.

Container Ozs:	8oz. = 8	Quart = 32	Gal. = 128	Pail = 640	Drum = 6,912	Tote = 35,200
Available / Skid Max:	NO →	NO →	NO →	YES 20	YES 216	YES 275
Application:	→ →	→ →	→ →	Initial Maintain	Initial Maintain	Initial Maintain
Ratio:	1: 1,500 3,000	1,500 3,000	1,500 3,000	1,500 3,000	1,500 3,000	1,500 3,000

	50	→	→	→	→	→	→	5ozs	2.2ozs	←	←	←	←
G	100	→	→	→	→	→	→	9ozs	4.3ozs	←	←	←	←
A	200	→	→	→	→	→	→	18ozs	8.6ozs	←	←	←	←
L	500	→	→	→	→	→	→	43ozs	21.4ozs	←	←	←	←
L	1,000	→	→	→	→	→	→	86ozs	42.7ozs	←	←	←	←
O	2,000	→	→	→	→	→	→	2gals	85.4ozs	←	←	←	←
N	3,000	→	→	→	→	→	→	2gals	1gals	2gals	1gals	←	←
S	4,000	→	→	→	→	→	→	3gals	2gals	3gals	2gals	←	←
	5,000	→	→	→	→	→	→	4gals	2gals	4gals	2gals	←	←
O	7,500	→	→	→	→	→	→	5gals	3gals	5gals	3gals	←	←
F	8,000	→	→	→	→	→	→	6gals	3gals	6gals	3gals	←	←
	9,000	→	→	→	→	→	→	6gals	3gals	6gals	3gals	←	←
F	10,000	→	→	→	→	→	→	7gals	4gals	7gals	4gals	7gals	4gals
U	12,000	→	→	→	→	→	→	8gals	4gals	8gals	4gals	8gals	4gals
E	14,000	→	→	→	→	→	→	10gals	5gals	10gals	5gals	10gals	5gals
L	15,000	→	→	→	→	→	→	10gals	5gals	10gals	5gals	10gals	5gals
	20,000	→	→	→	→	→	→	14gals	7gals	14gals	7gals	14gals	7gals
T	25,000	→	→	→	→	→	→	17gals	9gals	17gals	9gals	17gals	9gals
O	45,000	→	→	→	→	→	→	30gals	15gals	30gals	15gals	30gals	15gals
	50,000	→	→	→	→	→	→	34gals	17gals	34gals	17gals	34gals	17gals
B	75,000	→	→	→	→	→	→	50gals	25gals	50gals	25gals	50gals	25gals
E	80,000	→	→	→	→	→	→	54gals	27gals	54gals	27gals	54gals	27gals
	89,950	→	→	→	→	→	→	60gals	30gals	60gals	30gals	60gals	30gals
C	96,000	→	→	→	→	→	→	64gals	32gals	64gals	32gals	64gals	32gals
O	100,000	→	→	→	→	→	→	67gals	34gals	67gals	34gals	67gals	34gals
N	110,000	→	→	→	→	→	→	74gals	37gals	74gals	37gals	74gals	37gals
D	115,000	→	→	→	→	→	→	77gals	39gals	77gals	39gals	77gals	39gals
I	119,900	→	→	→	→	→	→	80gals	40gals	80gals	40gals	80gals	40gals
T	135,000	→	→	→	→	→	→	90gals	45gals	90gals	45gals	90gals	45gals
I	159,500	→	→	→	→	→	→	107gals	54gals	107gals	54gals	107gals	54gals
O	200,000	→	→	→	→	→	→	134gals	67gals	134gals	67gals	134gals	67gals
N	240,000	→	→	→	→	→	→	160gals	80gals	160gals	80gals	160gals	80gals
E	320,000	→	→	→	→	→	→	214gals	107gals	214gals	107gals	214gals	107gals
D	350,000	→	→	→	→	→	→	234gals	117gals	234gals	117gals	234gals	117gals
	400,000	→	→	→	→	→	→	267gals	134gals	267gals	134gals	267gals	134gals

Packaging & Shipping : 12 8oz bottles/case (where available) 60 cases per skid; 12 quart bottles/case (where available) 40 cases per skid, 4 gallons/case (where available) 40 cases per skid, 20 pails/skid, 4 drums/skid, one 275-gallon HDPE tote bin per skid. All small packaged items (where available) are induction-sealed. Pails and drums are steel with closed heads. All containers and skids are non-returnable. Please recycle in accordance with local statutes. When seeing an arrow, we recommend the next larger or smaller size container.