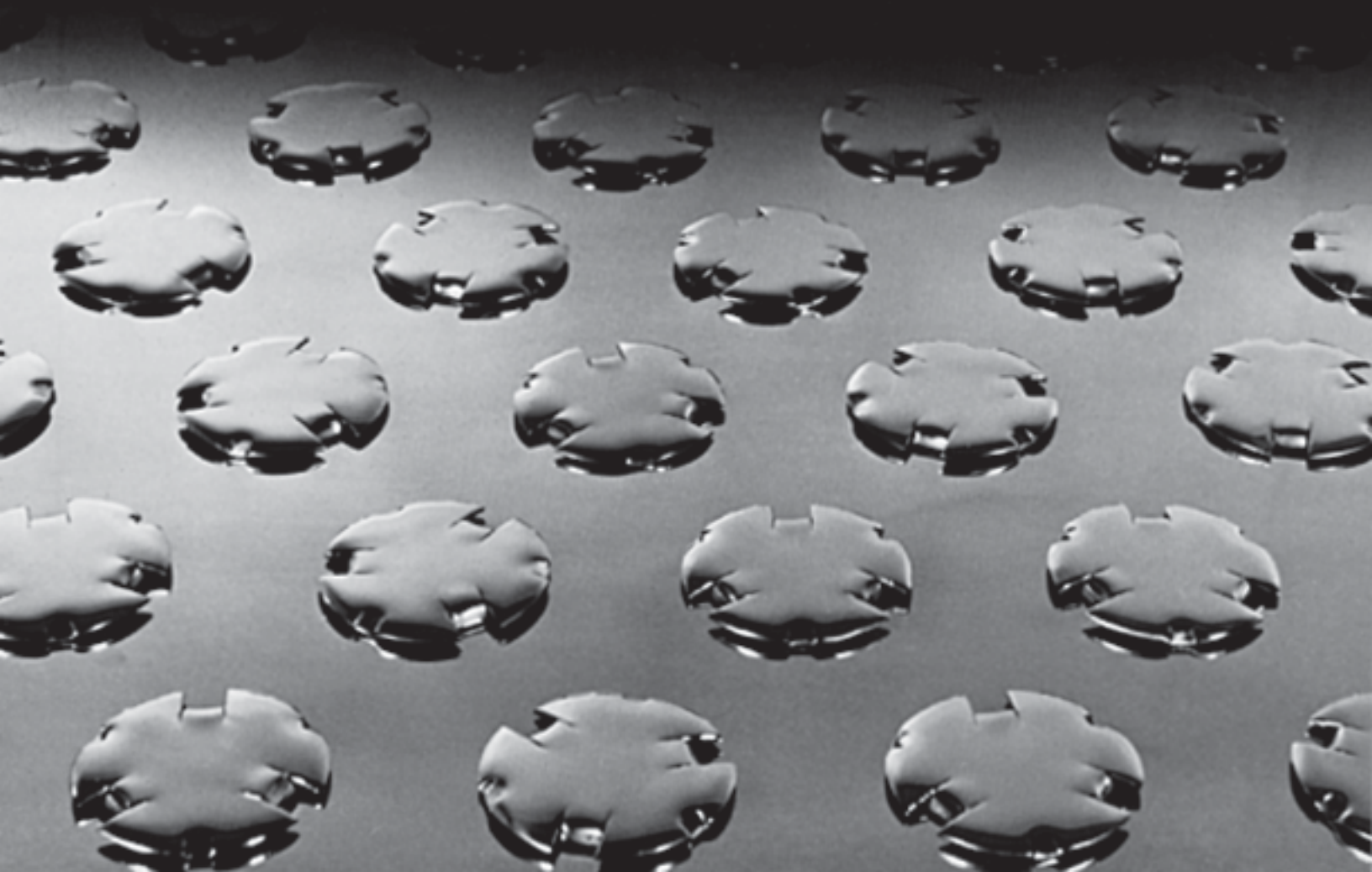
AMACS

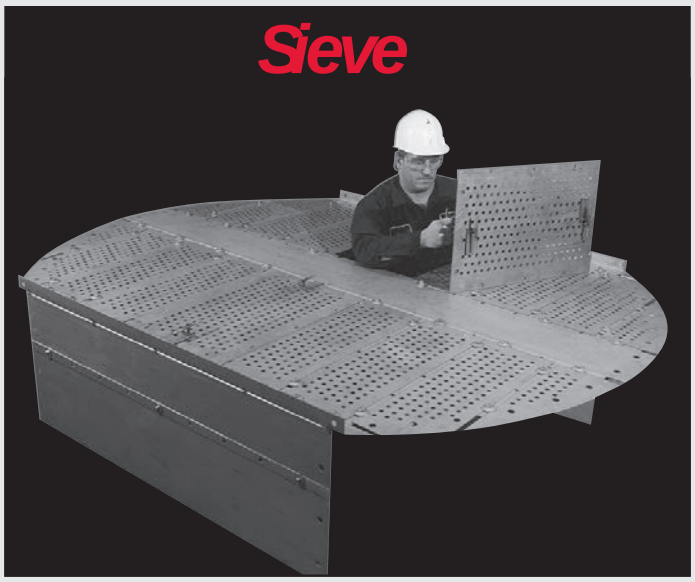
Fractionation Trays



A full line of fractionation trays

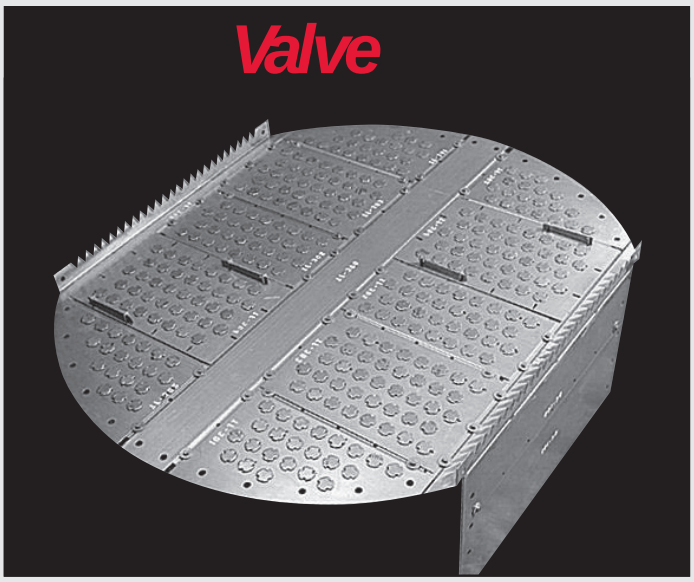
AMACS has been designing and manufacturing fractionation trays and other column internals for over 25 years. In supplying new designs and replacement trays, the AMACS engineering department combines data from FRI and our own proprietary research and development. Extensive experience in the re□ning and process industries enables AMACS to replace most existing trays, regardless of original manufacturer.

Sieve



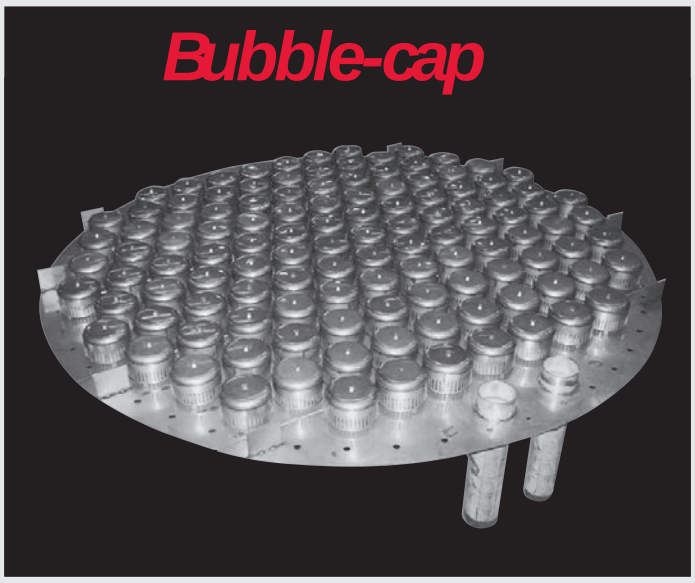
Sieve trays are the most widely used mass transfer device due to their simplicity, versatility, capacity, and cost-e□ectiveness. AMACS incorporates the latest sieve technology in accordance with industry practices and FRI tests. Our designs utilize features such as sweptback weirs, sloped downcomers, and multi-pass and dual-□ow arrangements to accommodate customer requirements.

Valve



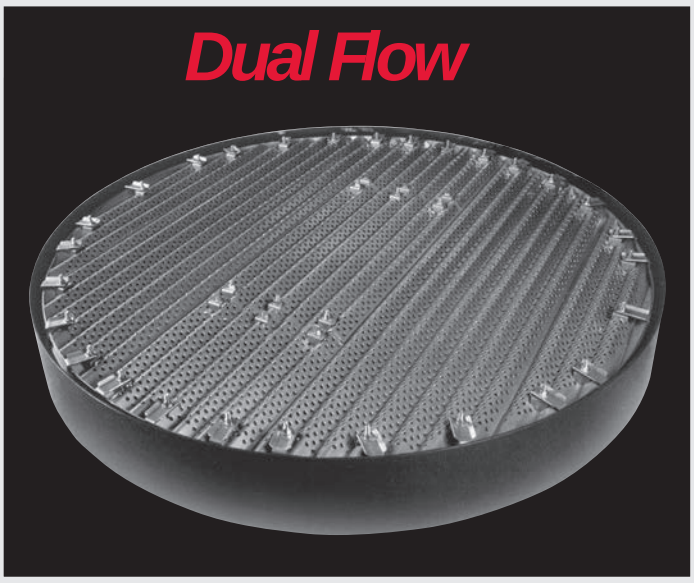
Valve trays designed and built by AMACS include anti-spin devices, twisted leg construction to resist dislodging, and crimped edges to prevent adherence to the tray deck. Options include contoured hole edges for lower pressure drop and multiple valve weights for uniform operation over wide □ow ranges. Rectangular, caged, and □xed valves can also be supplied.

Bubble-cap



Bubble-cap trays have numerous applications in re□neries and gas plants due to e□ectiveness over a broad range of □ow conditions and low susceptibility to fouling by particulates and residues. AMACS provides standard and custom designs in numerous materials, gauges, and styles to meet the most stringent process and turndown requirements.

Dual Flow



Specialty Dual Flow Trays, with over 200 applications worldwide in distillation, absorption, stripping, and heat transfer, dual □ow trays are a proven mass transfer device capable of debottlenecking existing operations or downsizing new tower designs.

AMACS Tray Design Standards

Process Standards

1. Vapor and liquid design loads ≤ 80% of flood
2. Foam derating factor for capacity and area:
   - No foaming expected 1.0
   - Moderate foaming expected 0.85
   - Severe foaming expected 0.70
3. Valves fully open at 100% of design load

Mechanical Standards

1. Valve edge crimped to prevent adherence to deck
2. Perforations or valves on triangular (staggered) pitch
3. All structures sectionalized to pass easily through tower access ports 36" in diameter
4. Deflection of tray deck ≤ 1/4" under design load
5. Maximum allowable uplift pressure: 20 to 140 psf
6. Manways on installed trays are vertically aligned.
7. Manways are removable by one person above or below.
8. Width of tray support rings:

Diameters up to	2' 6"	ring width 1.5"
Larger diameters up to	5' 6"	ring width 2.0"
Larger diameters up to	12' 6"	ring width 2.5"
Larger diameters up to	19' 6"	ring width 3.0"
Larger diameters up to	24' 6"	ring width 3.5"
Diameters larger than	24' 6"	ring width 4.5"

9. Minimum 3/4" overlap of tray and support ring
10. Spacing between bolt holes around tray edge: 4" to 7"
11. Minimum 2" calming zone at outlet weir
12. Trays can be installed and removed from above or below.
13. Available metal thicknesses: 14 gauge up to 3/8" plate
14. Available metals: all types of carbon steel and stainless steel; high-alloy; exotics
15. Trays are designed to support total dead load plus 300 pounds concentrated load.

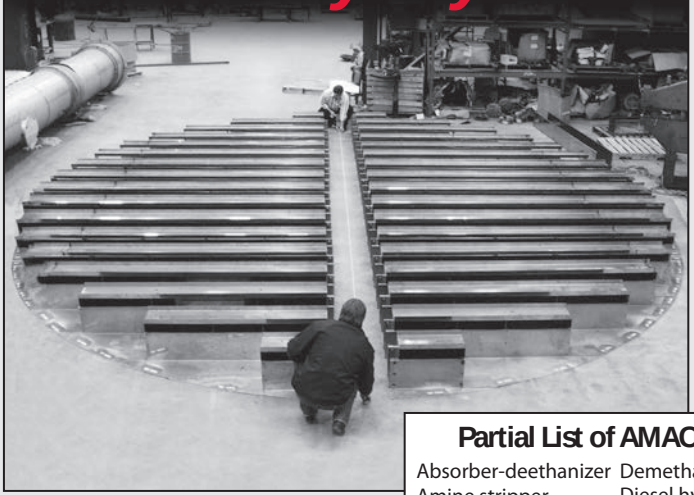
Fabrication Standards

1. Holes punched from top side of deck
2. Gasketing (listing tape on bubble-cap and chimney trays and between dissimilar metals): fiberglass, 1/16" thick.
3. Fasteners provided include 5% spares.
4. Edges of deck sections are free of burrs.
5. All parts die-stamped with part numbers to aid assembly.
6. Dimensional tolerances:
   - Outside diameter of tray:
     - Diameters 8' or less ..... ±1/4"
     - Diameters over 8' ..... ±1/2"
   - Height of inlet and outlet weirs ..... ±1/16"
   - Departure from level of outlet weirs ..... ±1/16"
   - Perforation diameter ..... ±1/64"
   - Distance between perforations ..... ±1/16"
   - Departure from mean of any tray supporting member ..... Camber ±1/16"
   - Clearance, downcomer to tray floor ..... ±1/8"
   - Tray floor total departure from level in any direction:
     - Diameters 2' 6" to 4' ..... ±1/8"
     - Larger diameters up to 7' ..... ±3/16"
     - Diameters larger than 7' ..... ±1/4"

Available Tray Features

- Vapor capacity enhancements for valve and sieve trays: anti-blowing baffles, anti-jump baffles, vapor tunnels
- Alternative weirs: picket-fence, sawtooth
- Dual valve weights to minimize weepage at turndown
- Low-pressure-drop holes for valve and sieve trays: Contoured top (downstream) Contoured bottom (upstream) as well as top

Chimney trays



Other internals provided by AMACS for trayed and packed columns include chimney trays of several types for feed blending and side draws, often with provisions for flashing feed and other design challenges.

Tray hardware

AMACS fabricates hardware suitable for most trays. We stock various metals and sizes for 24-hour shipment. Our consignment contracts are especially convenient: use what you need out of a shipment and return the rest.

Partial List of AMACS Tray Applications

Absorber-deethanizer	Demethanizer	Hydrocracker plant
Amine stripper	Diesel hydrotreater	Hydrogen absorber
Ammonia scrubber	Diesel stripper	Methanol extractor
C3 Splitter	Ethanol plant	Methanol fractionator
C4 Splitter	Ether column	Naphtha splitter
Caustic quench tower	FCC main fractionator	Naphtha/water wash
Caustic tower	Furfural plant	Raffinate stripper
Coker fractionator	Gas scrubber	Resin plant towers
Crude tower	HVGO tower	Vacuum flash
Debutanizer	Hydrodesulfurization absorber	Washing drum
Deethanizer		Water wash tower

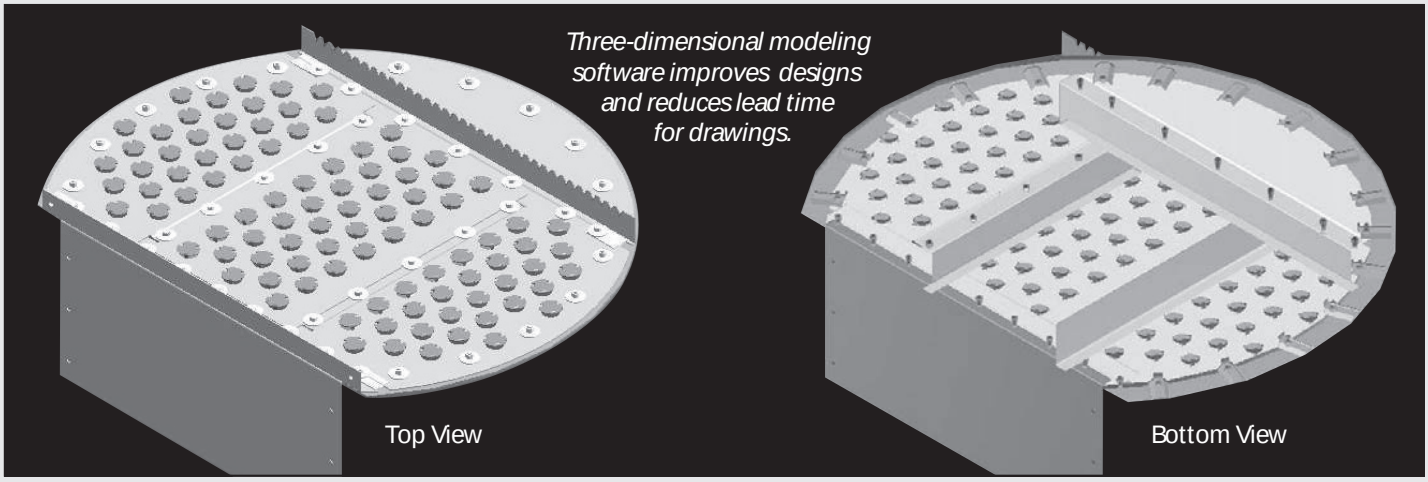
Advanced methods for better quality, service and value

Process Engineering

AMACS Process Tower Internals Engineering department utilizes its extensive experience in the oil, gas, refining, and chemical industries to provide a complete line of fractionation trays and tower internals. Our longstanding commitment to research and development has kept AMACS in a leading position in the field of mass transfer and separations technology.

Design and Manufacturing

Designers and manufacturing engineers at AMACS meet the challenges of demanding process applications by using the latest computer-aided engineering and drafting tools. These systems are integrated with computer-controlled manufacturing equipment to produce the highest quality products. High levels of automation reduce set-up time and streamline production, allowing quick response and short delivery times. AMACS quality assurance engineers ensure that work is completed in strict accordance with customers' specifications.



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