

**Baretti**®   
EQUIPMENT FOR OIL AND CHEMICAL INDUSTRIES

## Fractionation Trays

Innovation | Reliability | Dynamism



[www.baretti.it](http://www.baretti.it)



# 125 Years of History



## **Fabio Baretta Paleari**

CEO

Baretti was founded in 1890 by my grandfather Giovanni Baretti. Since then, Baretti has seen several transformations and gone through evolutions to meet the required market needs and the socio-economic changes. Among all, I would like to mention the most vital and successful ones.

During the fifties, inspired by Mr. Enrico Mattei, the President of ENI, we entered into the business of the equipment for the newly world-wide and growing hydrocarbon industry. Then, we added the construction and installation of Marine Loading Arms and special facilities for the berthing of oil super tankers.

In eighties, we started to design and to construct special high-precision mechanical manufacturing machines. Even, we manufactured components for nuclear plants, as per that period, the most advanced certified quality management system.

Today, our business is focused upon technologies for the hydrocarbon processing industry and separation components. But what we have learned and experienced in the course of the past 125 years still permeates the company. We learned the importance of our Customers and earned their respect. We value the importance of passionate Employees.

We still have the same enthusiastic entrepreneurial spirit, which took me

to USA, almost 50 years back, to acquire license for tray' technologies creating new opportunities. We still strive for innovative technologies, products and applications. Nowadays, our products are present in almost every country having hydrocarbon processing industries but we still follow few basic but very important principles:

- Be humble and be curious: every day we can learn something new
- Act in good faith: leave up to our conscience with honest words and actions
- Struggle for Quality: Neither mistakes nor delays are allowed
- Meet Customer Satisfaction: Give the best product at the best price
- Practice Safety: life is the most important gift that God has given us

In the course of all these years, I am very proud of the results we have achieved and I personally present my gratitude to all our Customers and Employees.

However, every day we are working for a better future where we see Baretti growing into a more profitable company and expand its reach in every corner of the world with the wish of adding value to Customers and Civil-Society while keeping in harmony with the global environment.

# TABLE OF CONTENTS

## Trays

65 years of Trays experience .....	4
Trays around the World .....	5
The new frontiers for Trays .....	6
Conventional Valves Trays .....	9
Conventional Bubble Caps & Sieve Trays .....	10
Associated Internals .....	11
Installation Hardware .....	12

## Trays Design Features

Quick Open Manway .....	13
Lip Joint Connections .....	13
Cartridge Tray .....	13
Inlet Vane Distributor .....	14

## Baretti Advantages

Design, engineering and manufacturing .....	15
A complete service .....	16
Tray Design Software .....	17

# 65 YEARS OF TRAYS EXPERIENCE

## BARETTI:

An established name in the fractionation column business.

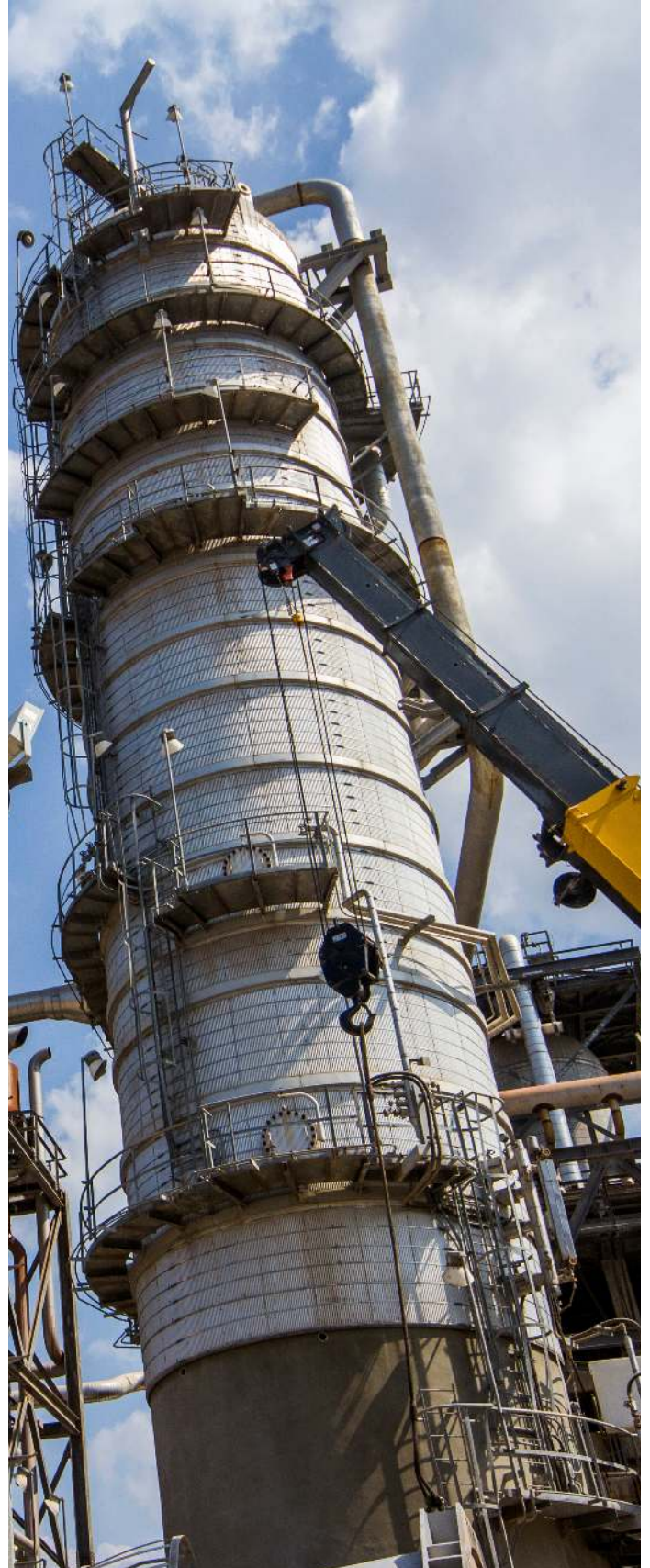
Our trays have been installed in every type of columns and applications.

### Tray Types

- Valve Trays
  - Rectangular Floating Valves
  - Round Floating Valves
  - Fixed Valves
- Sieve Trays
- Bubble Cap Trays
- Baffle Trays
- Cartridge Trays
- Liquid/Liquid Extraction Trays
- High Performance Trays - HPT
- Special Features
  - Lip Joint Connection
  - Quick Opening Manway
- Anti- clogging Technologies
- Hardware
  - Clamps
  - Bolting
  - Valves

### Applications

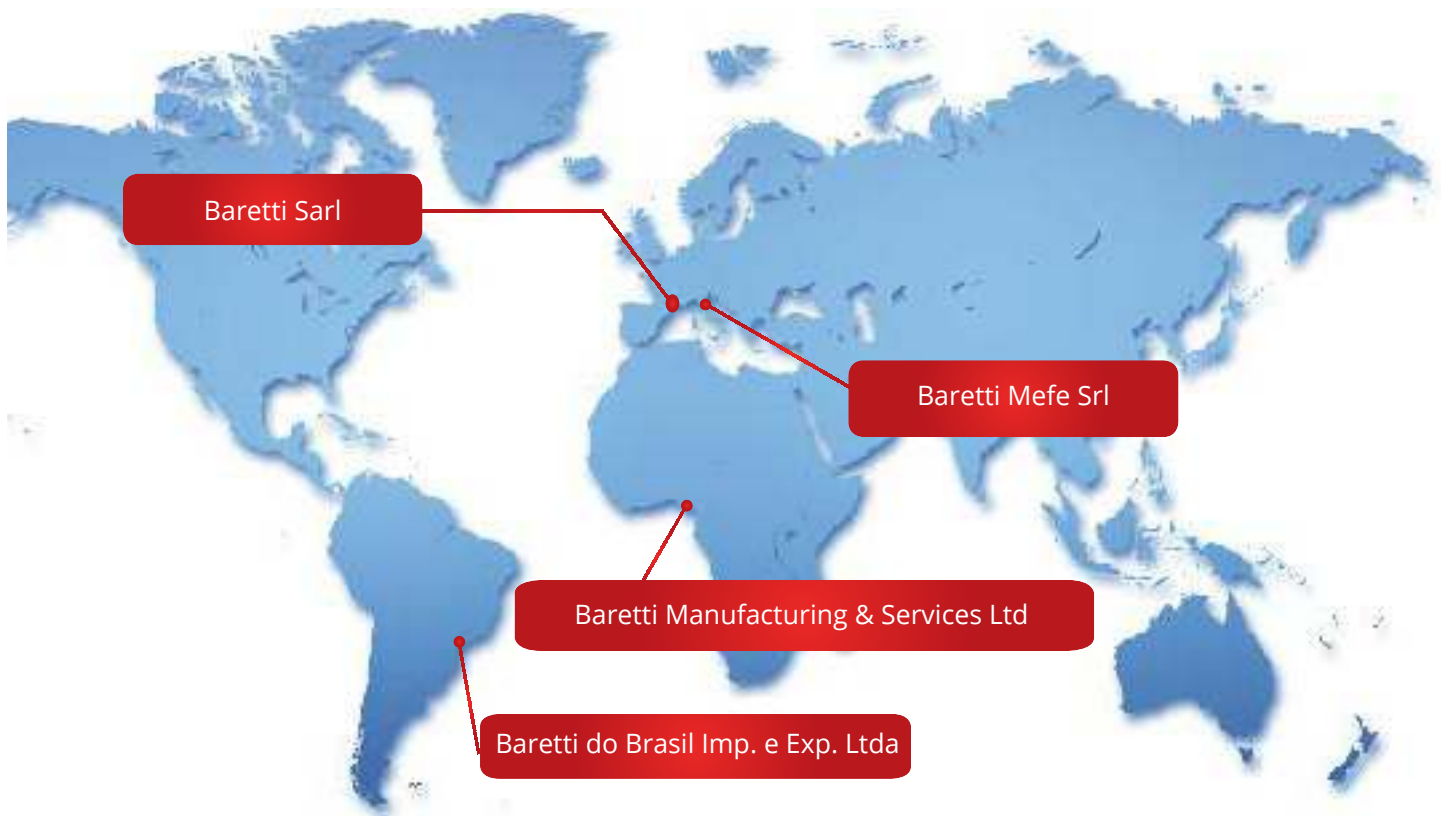
- Atmospheric Crude Towers
- Fuel Vacuum Towers
- Lube Vacuum Towers
- FCC Main Fractionators
- Coker Fractionators
- Stabilizers
- Amine Absorption Towers
- Regenerators
- Light-ends Distillation Towers
- Super Fractionators
- Quench Towers



# TRAYS AROUND THE WORLD

## Thousands applications around the world

The map shows Baret's global presence .



We have representatives all over the World



# THE NEW FRONTIERES FOR TRAYS

## High Performance Trays

### FEATURES

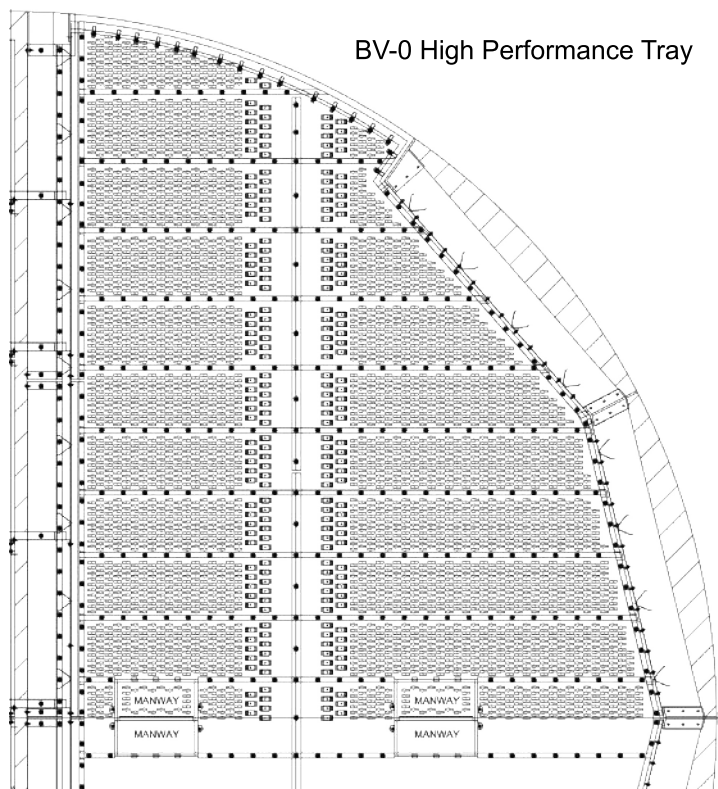
- Maximised active area
- Swept-back Downcomers
- Sloped Downcomers
- Micro Valves
- Bubble Promotors
- Push Valves
- Clear Liquid Separators

### RESULTS

- Increased Efficiency
- Increased Capacity

### ADVANTAGES

- More trays in the same space
- Lower reflux ratio
- Lower pressure drop



### BUBBLE PROMOTORS

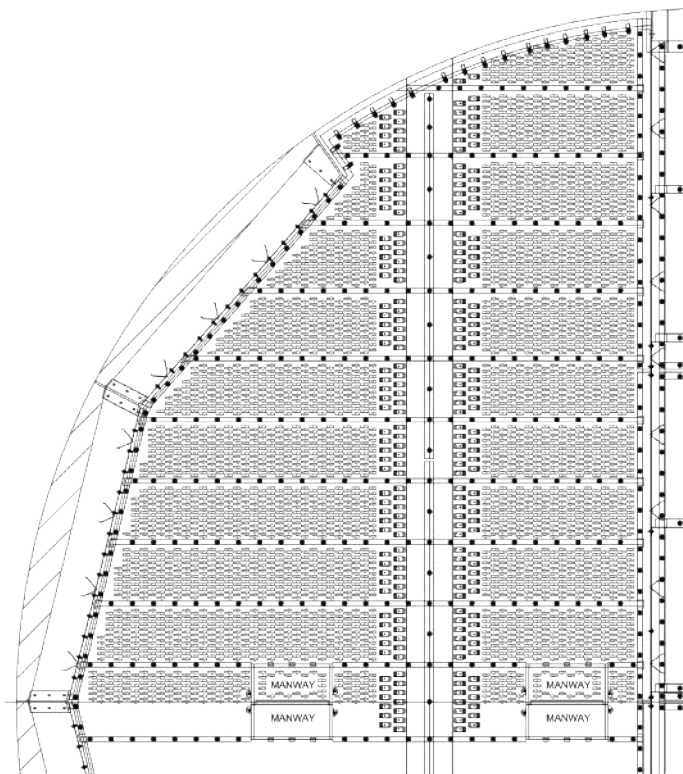
Bubble promoters installed at downcomer outlet enhance tray activity across the trays and reduce pressure drops.



### PUSH VALVES

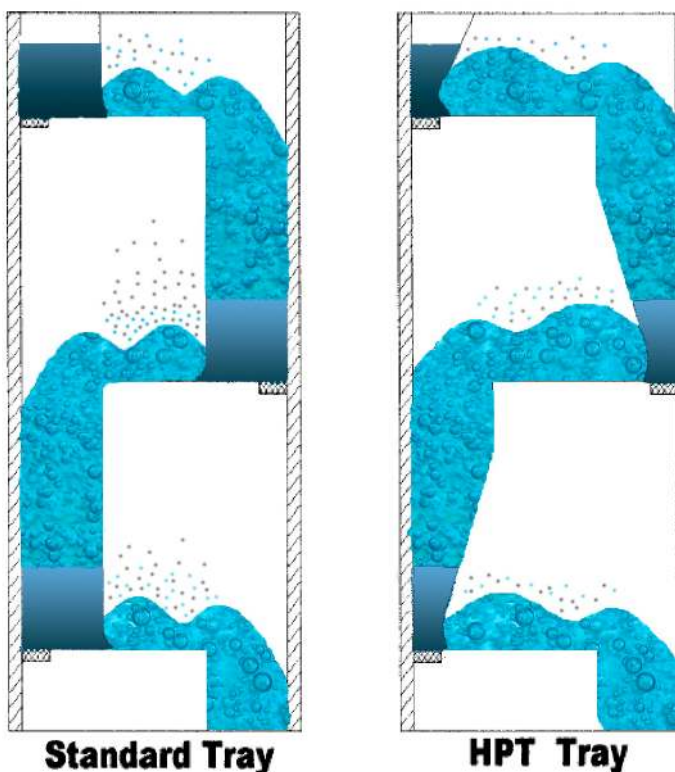
Placing push valves around the tray periphery prevents liquid stagnation zones.

# THE NEW FRONTIERES FOR TRAYS



**SWEPT-BACK** outlet weirs offers the following advantages:

- Reduction of side dead areas with relevant improvement in overall tray activity
- Longer outlet weirs provide pressure drop reduction and more uniform liquid flow across the trays
- Longer outlet clearances reduce the under downcomer velocities and back-up
- Equal side and center weir length



**BARETTI HIGH PERFORMANCE TRAYS** are designed including all the following features:

- The tray's area is uniformly active.
- There are non dead zones created by too short weir length.
- The active area and the downcomer area are well balanced to maximize the use of column area
- The downcome bottom outlet area is reduced only to a peripheral zone of the tray and no active area is blocked by the seal area of the tray above
- Clear liquid bypass helps to reduce downcome size in services with high liquid loading.

# THE NEW FRONTIERS FOR TRAY

## High Performance Baretti Micro Valve BV-0

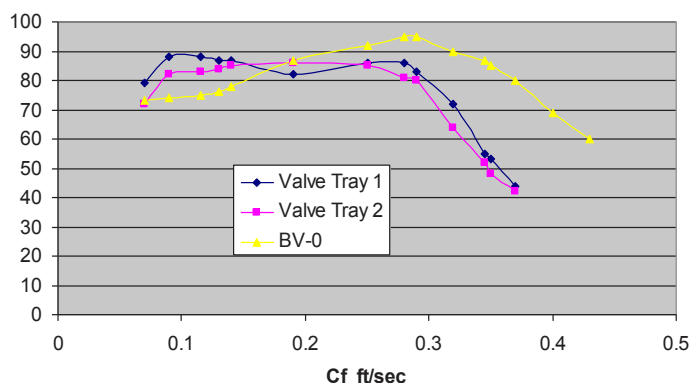


### Our BV-0 tests have demonstrated its superiority over traditional valves in four areas:

- Greater capacity by an average of 10% as compared to any other type of floating and fix valves
- Lower pressure drop.
- Lower leakage. In fact BV-0 valve has tapered shape with legs of different width. The larger one is facing the liquid flow so to deflect the liquid, preventing the liquid to flow into the valve aperture
- High mechanical strength mainly based on two large legs

**ADVANTAGES:** Directional, low leakage, higher capacity, lower entrainment, suitable for fouling services

BARETTI BV-0



### Other additional points to consider are:

- BV-0 extra capacity can be used to reduce the tray spacing in existing tray columns and allowing to increase the actual number of installed trays
- BV-0 units are available only as fix valves, since a floating unit of this size would be so light to get blocked in a random position.

# CONVENTIONAL VALVES TRAYS

Baretti can design trays with proprietary and conventional valves for any type of service

## BARETTI FLOATING VALVES

**Baretti BDH  
Standard Valves**



**Baretti BV-1  
Round valves**



**Baretti BV-2  
Round low pressure drop**



**Baretti BA-2  
Caged**

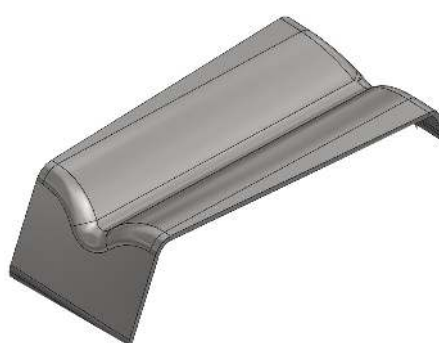


## BARETTI V-GRID FIX VALVES

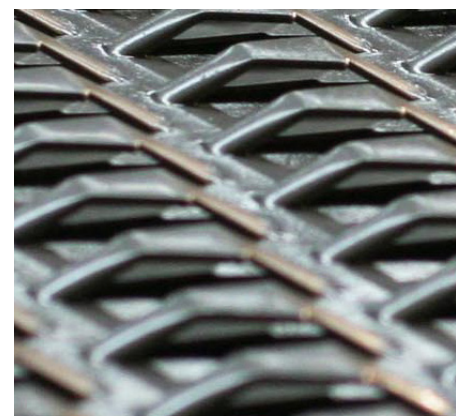
**Baretti SVG  
Fouling Services**



**Baretti ACVG  
Anti-clogging Valves**



**Baretti BV-0  
High Capacity**



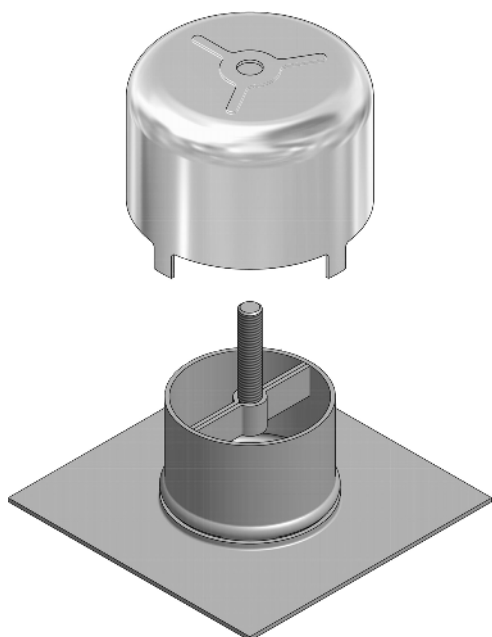
# CONVENTIONAL BUBBLE CAPS & SIEVE TRAYS

## Bubble Caps Trays

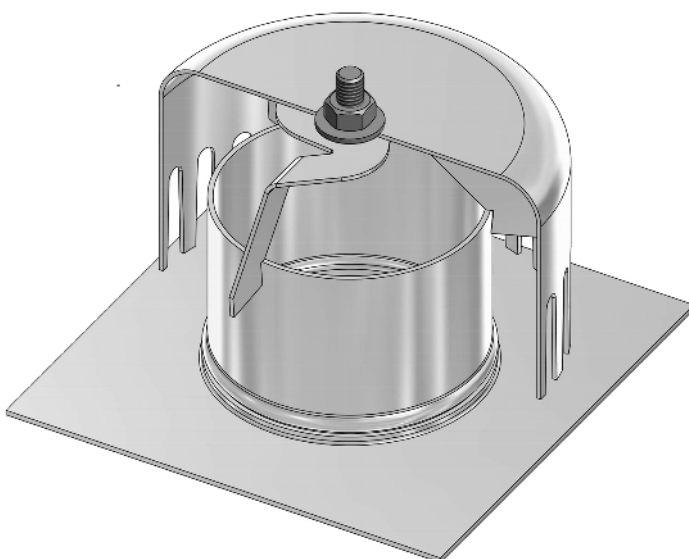
Bubble Caps are one of the oldest contacting devices used in distillation columns. For very low liquid rates services and special applications, Bubble caps are still used today.

There are basically two types:

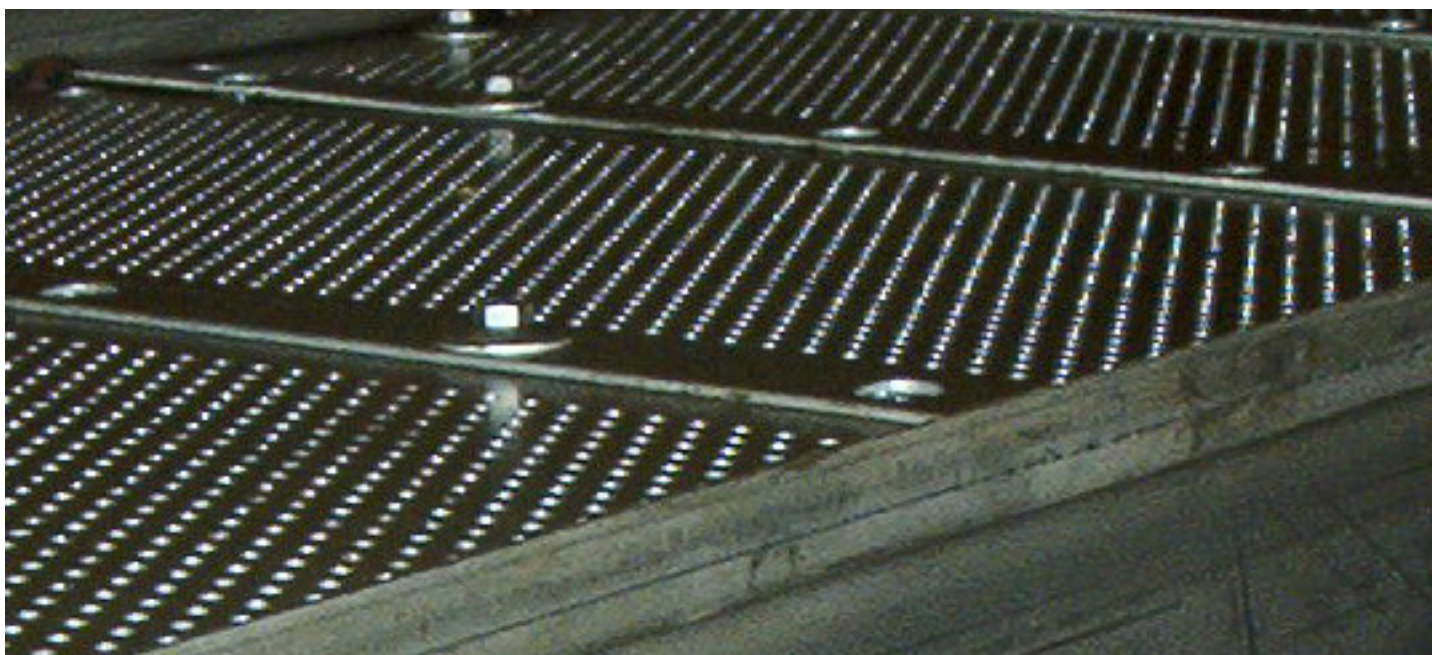
### Unslotted type Bubble Caps



### Slotted type Bubble Caps



## Sieve Trays



# ASSOCIATED INTERNALS

A number of complementary Internals are designed and manufactured by Baretti in order to provide a complete set of internals

## The most common are:

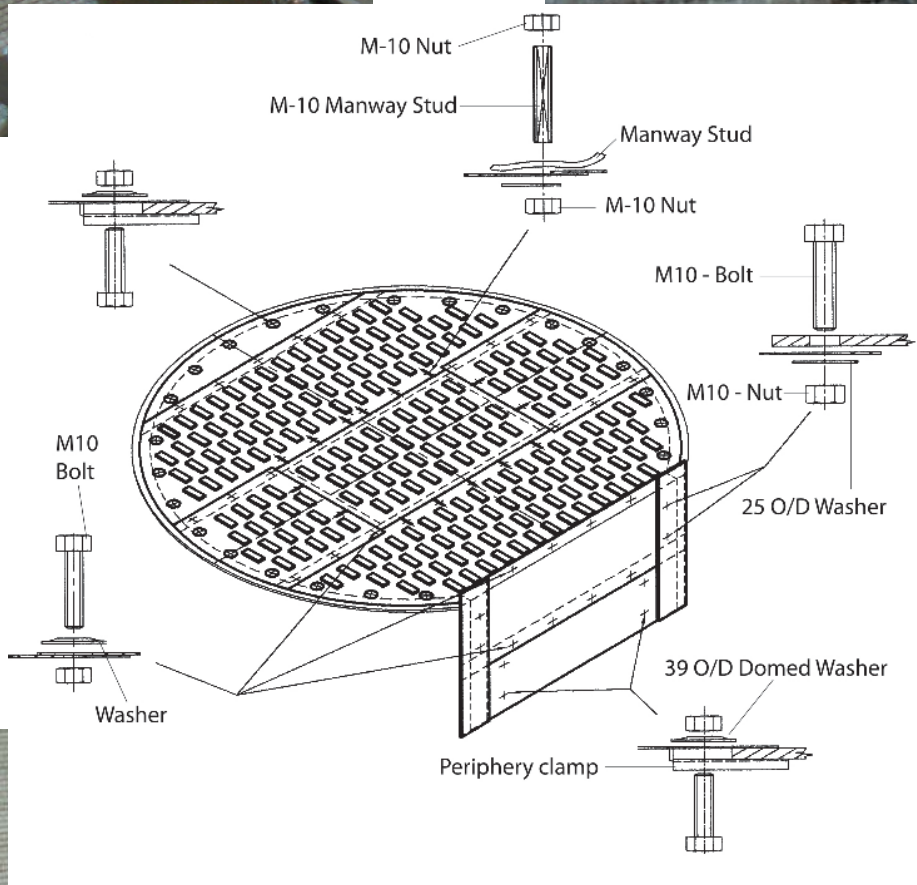
- Transition Trays
- Collector Tray
- Draw-Off Pans
- Feed Pipes
- Flashing Feed Devices
- Reinforced Trays
- Surge Relief Manways
- Quick Opening Manways
- Blanking Plates
- Liquid/Liquid Extraction Trays
- Cartridge Trays



Liquid Distributors Test Ring



# INSTALLATION HARDWARE



# BARETTI TRAY DESIGN FEATURES

Baretti trays are designed for maximum operability and reduced operating costs (OPEX). Special features are incorporated for an easy and quick installation reducing maintenance costs. Baretti standard design includes Quick Opening Manway and Lip Joints Connections. Cartridge trays with features for quick and smooth installation are designed for columns diameters below 900 mm.

## Quick Opening Manway



## Lip Joint Connection



## Cartridge Trays



# INLET VANE DISTRIBUTOR



Vacuum Tower - Feed Inlet Vane Distributor  
Column diameter 16.000 mm - Nozzles diameter 3.600 mm

# BARETTI ADVANTAGES

## Design, Engineering and Manufacturing



Baretti is committed to providing our customers with the latest technical services.

Baretti design procedures, based on the performance of thousands of successful installations, are the heart of our design philosophy.

Baretti computerized hydraulic and drafting procedures are maintained at the highest standards in order to keep improving our services quality



Baretti's technical office and fabrication facilities are located in northern Italy, close to the heart of Europe.

We can deliver vital materials and spare parts in matter of hours to most of our clients.

We are close to the major ports of Europe allowing us to easily deliver materials that allow us to serve our client's emergency parts and hardware of any kind.

**Our technical team is available 24 hours a day to assist our clients**

# BARETTI ADVANTAGES

## A Complete Services

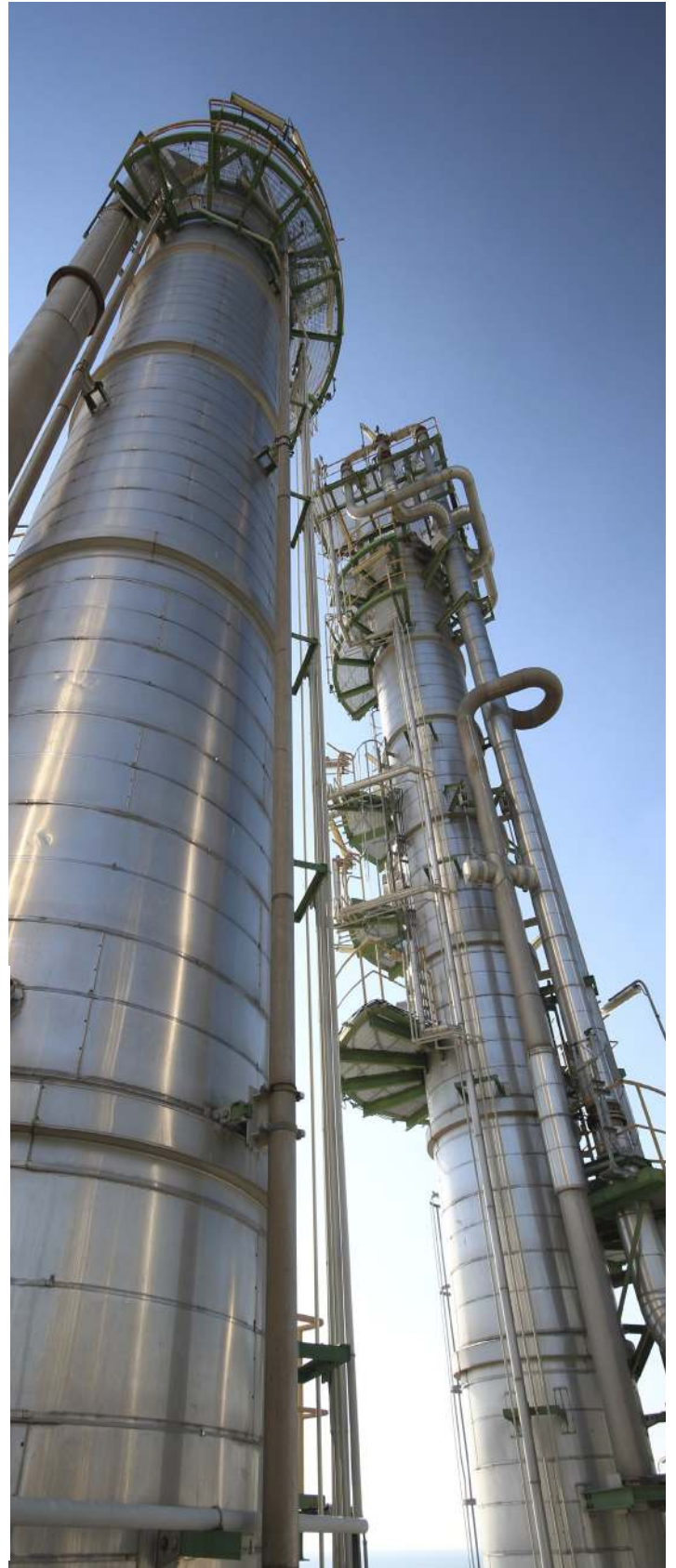
Baretti in addition to supplying trays and internals, provides a full range of services including:

- Process simulation design and optimization
- Mechanical design
- Installation supervision
- Column inspection
- Turn-around assistance
- Spare parts
- Turn-key Jobs



Baretti provides mechanical and functional inspection to analyze your systems for:

- Erosion
- Corrosion
- Polymerization
- Coking
- Pressure Profile
- Temperature Profile



# BARETTI ADVANTAGES

## Tray Design Software

Baretti has developed a new version of its Software working on the web. This software is at disposal of all our clients and it is accessible at our server.

In order to have the possibility to use it, the following few inputs need to be given

- Contact our sales secretary at baretti@baretti.it
- Ask for a personal USERNAME and PASSWORD

You'll be furnished via e-mail with these data and an instruction file will guide you through the peculiarities of this software.

Our sales office will be always at your disposal to help you in special or complex cases.

The screenshot displays the Baretti Tray Design Software interface. It features a top navigation bar with 'COMPANIES', '+ ADD COMPANY', 'OFFERS', 'TRAYS', and 'STATISTICS'. Below this is a 'General Data' section with fields for 'Item:' (T-30301), 'Service:' (Absorber), and 'Plant:'. A 'Geometry' dialog box is open, showing parameters for 'D\_3100' such as Diameter (3100 mm), Tray Spacing (610 mm), and various weir and outlet dimensions. A 'Fluid definition' table is visible, listing parameters like VAPOR Density, System factor, LIQUID Rate, LIQUID Multiplier, and LIQUID Density. A 'Results Id Case 1' table shows calculated values for Area DC Top, Area DC Btm, Ratio Btm/Top, Top Weir Length, Btm DC Length, Inlet Velocity, Outlet Velocity, Weir Loading, Oper. Regime, Flow Path, Act. Area, and Weep Point. At the bottom, a 'Case' table provides a summary of the design parameters for the selected case.

Item:	Service:	Plant:	Description:
T-30301	Absorber		Results Id Case 1

Fluid definition				
VAPOR Density kg/m <sup>3</sup> (0 - 200)	System factor (+/- 1)	LIQUID Rate kg/hr	LIQUID Multiplier (0.2 - 5)	LIQUID Density kg/m <sup>3</sup> (200 - 1200)
72.33	0.75	262270	1	1068
72.33	0.75	262270	0.5	1068
72.33	0.75	262270	1.1	1068
77.8	0.75	231515	1	1068
77.8	0.75	231515	0.5	1068
77.8	0.75	231515	1.1	1068
75.28	0.75	348433	1	1068

Results Id Case 1	
3% CO2	U.M.
Area DC Top	mq
Area DC Btm	mq
Ratio Btm/Top	
Top Weir Length	mm
Btm DC Length	mm
Inlet Velocity	m/sec
Outlet Velocity	m/sec
Weir Loading	m <sup>3</sup> /m/min
Oper. Regime	Froth
Flow Path	mm
Act. Area	m <sup>2</sup>
Weep Point	0

Id	Fluid name	Geometry	description	Jet Flood %	Weir Loading m <sup>3</sup> /m/min	DC Flood %	Loss Under DC mm of Lq	Liq Crest mm	DC Back-up mm	Dry P-Drop mm of Lq	Tray P-Drop mm of Lq	Tray P-Drop mbar	Weep Lead %	% Valve Open	% Open Area	Valve Density #/m <sup>2</sup>
1	Tray #17 Case-A 100%	D_3100	3% CO2	45.96	1.01	31.22	16.05	36.4	210.4	26.49	84.74	8.84	36.4	0	7.94	240

LATEST

*Fully welded for heavy  
duty services*



*Indestructible*

# NOTES

## Your Worldwide Partner

### **Baretti Mefe Srl**

**SALES OFFICE & WORKSHOP**  
SS415 Ponte Adda  
26016 Spino d'Adda (CR) Italy  
Ph + 39 0373 96701  
Fax + 39 0373 967031

[baretti@baretti.it](mailto:baretti@baretti.it) - [www.baretti.it](http://www.baretti.it)

### **Baretti Sarl**

Ph: + 33 442 346097  
[robert.catrano@baretti.fr](mailto:robert.catrano@baretti.fr) - [www.baretti.fr](http://www.baretti.fr)

### **Baretti Do Brasil Imp. e Exp. Ltda**

Ph.: +55 (11) 3213-8568  
[baretti@baretti.com.br](mailto:baretti@baretti.com.br) - [www.baretti.com.br](http://www.baretti.com.br)

### **Baretti Manufacturing & Services Ltd**

Ph. + 33 442 346097  
[robert.catrano@baretti.fr](mailto:robert.catrano@baretti.fr) - [www.baretti.it](http://www.baretti.it)

[baretti@baretti.it](mailto:baretti@baretti.it)  
[www.baretti.it](http://www.baretti.it)

**ISO 9001:2015**  
**FRI Member**

© 2015 Baretti

20150930 Fractionation Trays