Baretti®

EQUIPMENT FOR OIL AND CHEMICAL INDUSTRIES

Tower Packing
Structured & Random

Innovation | Reliability | Dynamism

SINCE 1890 125 YEARS

www.baretti.it

125 Years of History

Fabio Baretti 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.

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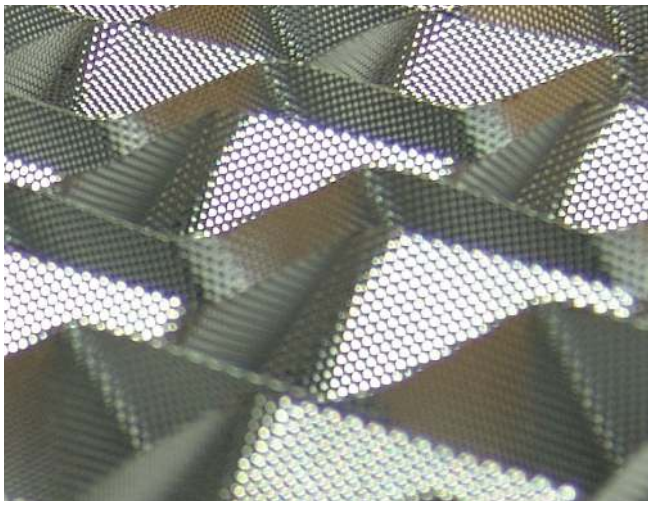
Tower Packing

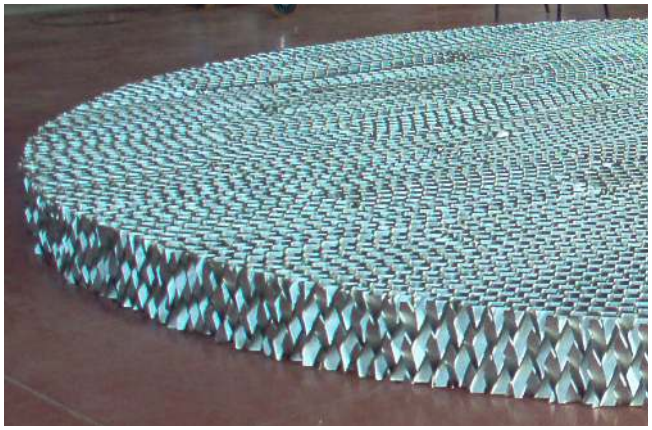
BARETTI STRUCTURED PACKING

Since mid 80' Baretti has successfully designed and installed structured packing and relevant internals in fractionation columns

The main refinery experiences have been in:

- Crude Atmospheric and Vacuum Towers:
  - Overflash / wash section
  - Pump arounds sections
  - Fractionations sections
  - Strippers
- FCC Main Fractionators
- Hydrocracking Main Fractionators
- Coker Main Fractionators
- Amine Absorbers and Regenerators
- Sour Water Strippers





Other areas of experience are:

- TEG Contactors
- Quench Towers
- LAB Alkylation
- Fibers
- Fatty Acids
- Deodorizers
- Air Cooling
- Scrubbers

Characteristics of BARETTI's structured packing is the unique treatment of the packing surface.

This treatment is the result of numerous tests performed by our engineers in the aim to obtain a surface with two main characteristics:

- Maximum surface area
- Maximum surface wettability

These two characteristics are fundamental to enhance the packing performances:

- The surface area determines the packing efficiency expressed in Theortical Stages per meter (TS/m) or Hight Equivalent to Theoretical Plate (HETP)
- Higher wettability improves the spreading of liquid on all available packing surface therefore the packing efficiency is maximized(HETP).
- Superlative mechanical resistance due to a fully welded assembly.

BARETTI STRUCTURED PACKING

Standard Types

Type	Specific Surface (m^2/m^3)	Crimp Angle	Average Efficiency (test/mix) TS/m	Crimp Angle	Average Efficiency (test/mix) TS/m
B-64	64	45°	1.0	60°	0.6
B-100	100	45°	1.2	60°	0.8
B-125	125	45°	1.5	60°	0.9
B-150	150	45°	2.0	60°	1.3
B-170	170	45°	2.2	60°	1.4
B-200	200	45°	2.5	60°	1.6
B-250	250	45°	3.0	60°	2.0
B-300	300	45°	3.5	60°	2.5
B-350	350	45°	4.0	60°	3.0
B-400	400	45°	4.5	60°	3.6
B-500	500	45°	4.8	60°	3.8
B-750	700	45°	5.8	NA	

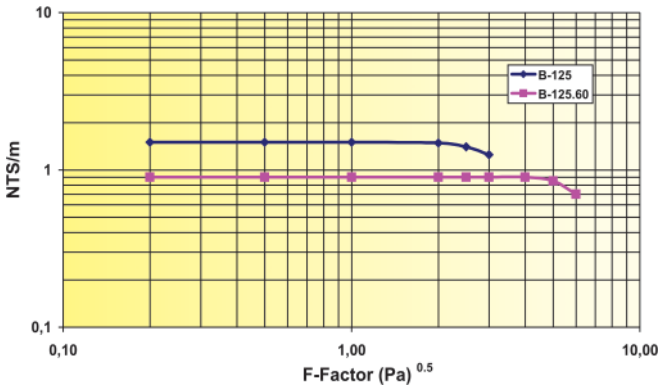
Baretti manufactures structured packing in various thicknesses and materials.

Type	Standard Thick. mm
B-64	0.25
B-100	0.15
B-125	0.15
B-150	0.15
B-170	0.10
B-200	0.10
B-250	0.10
B-300	0.10
B-350	0.10
B-400	0.10
B-500	0.10
B-750	0.10

Material Type
AISI 410S
AISI 304/304L
AISI 316/316L
AISI 317
AISI 321
Alloy20
Duplex
Hastelloy
Monel
Titanium

BARETTI STRUCTURED PACKING TECHNICAL DATA

Structured Packing B - 125



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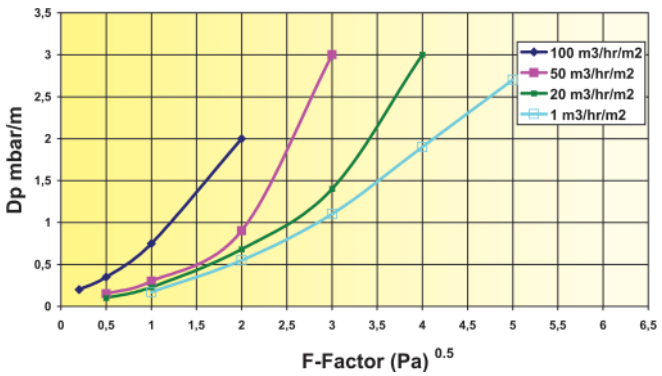

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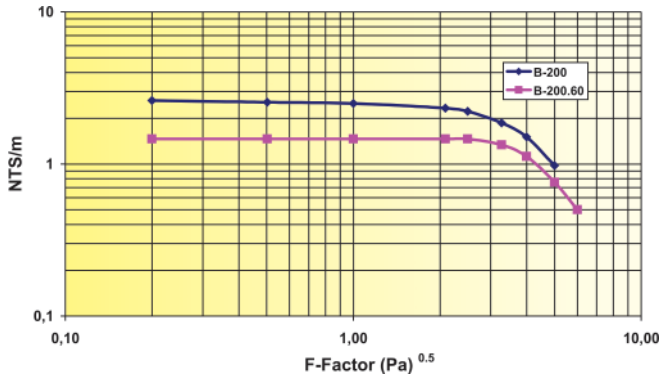

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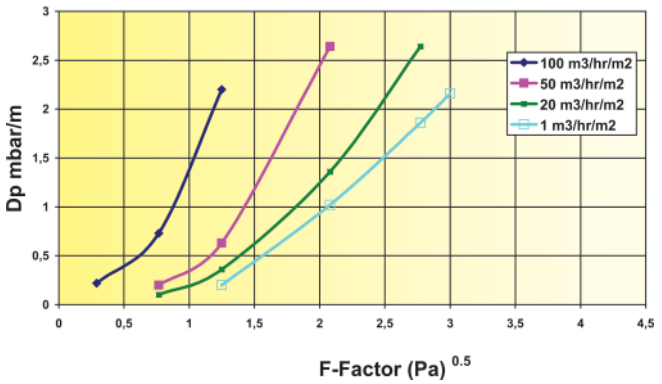
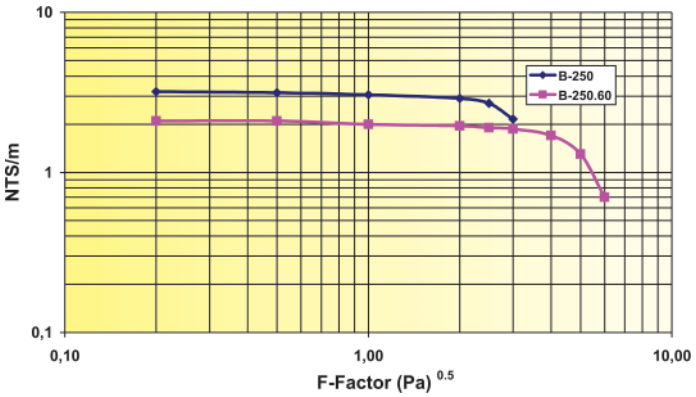


BARETTI STRUCTURED PACKING TECHNICAL DATA

Structured Packing B - 250



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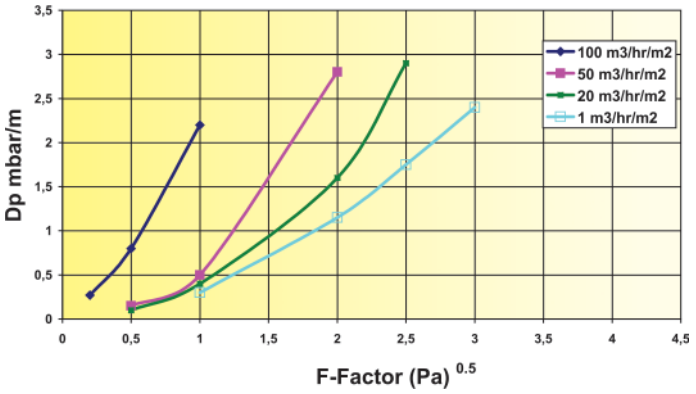

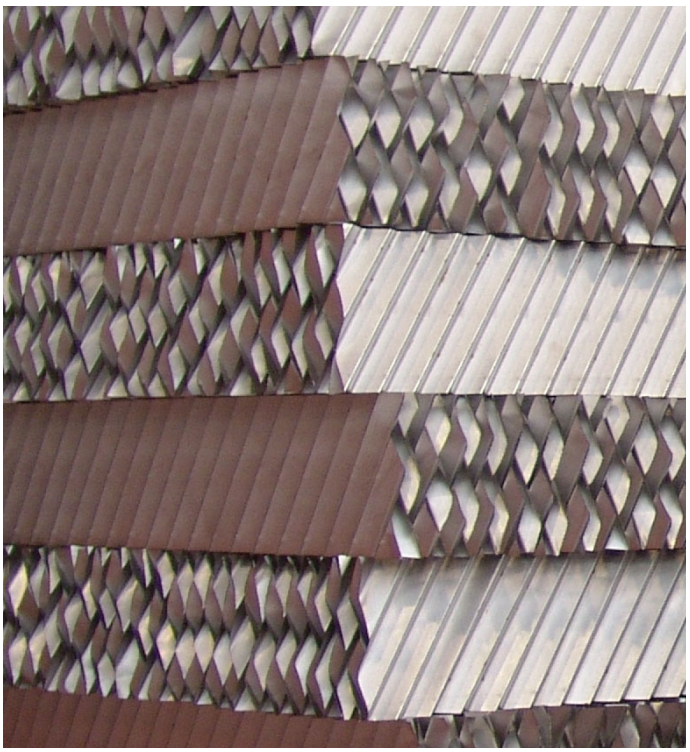

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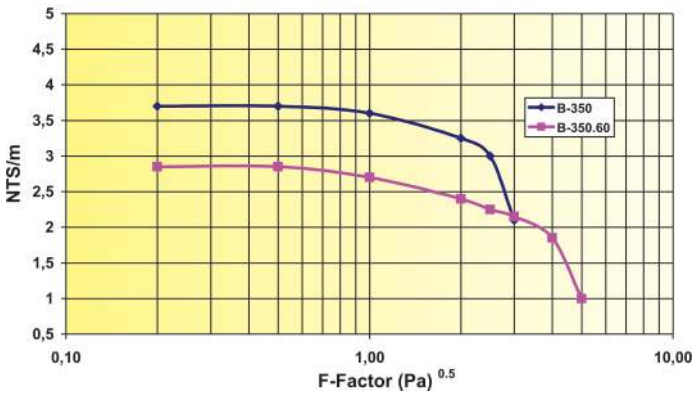

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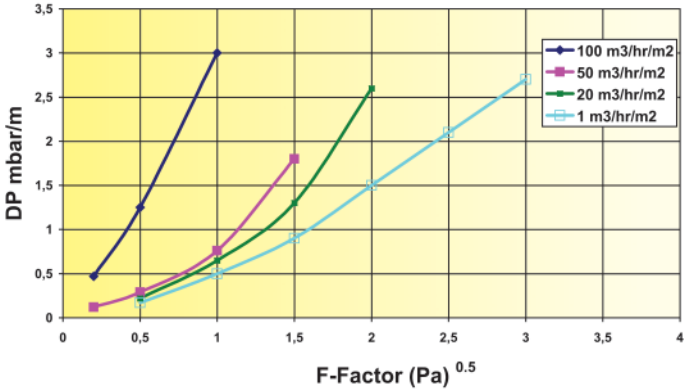
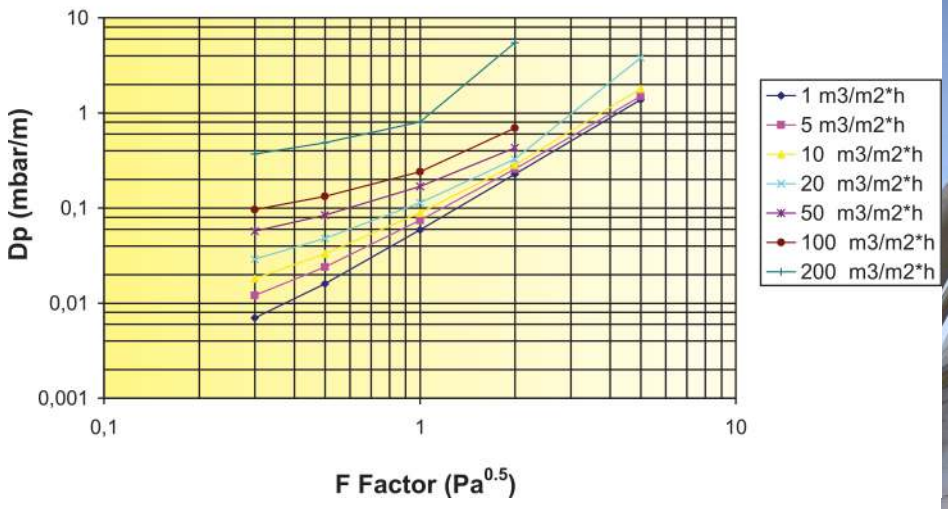


BARETTI STRUCTURED PACKING TECHNICAL DATA

Structured Packing B - 64.45



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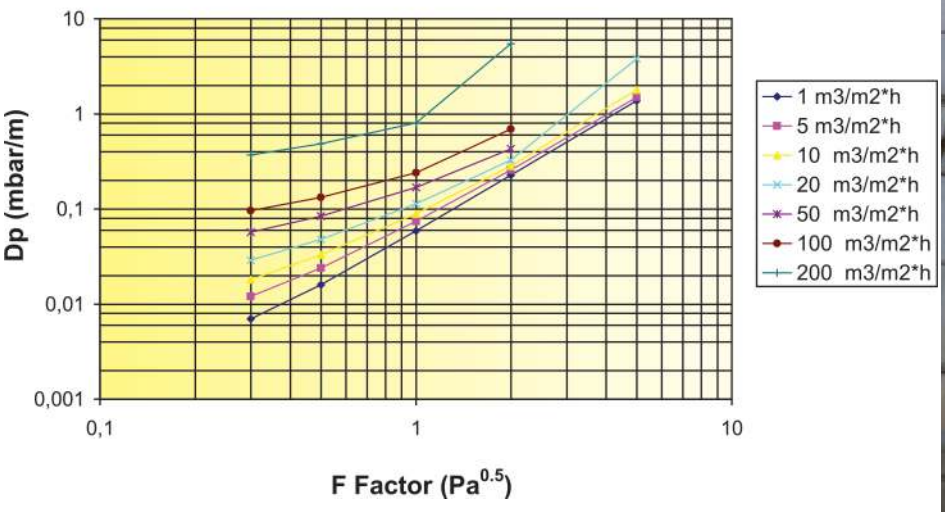
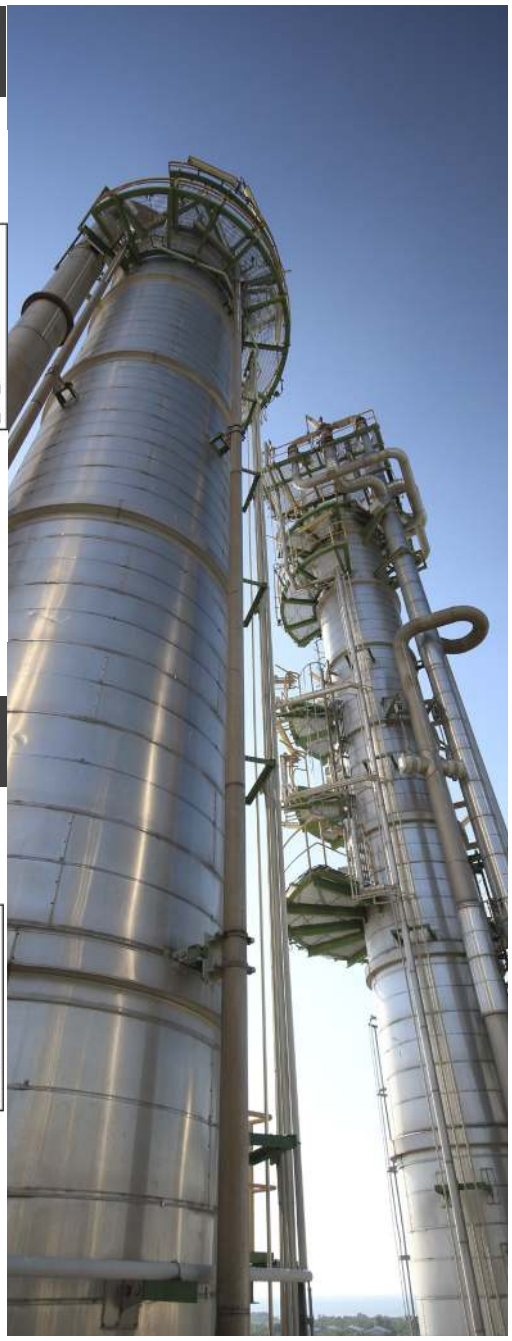


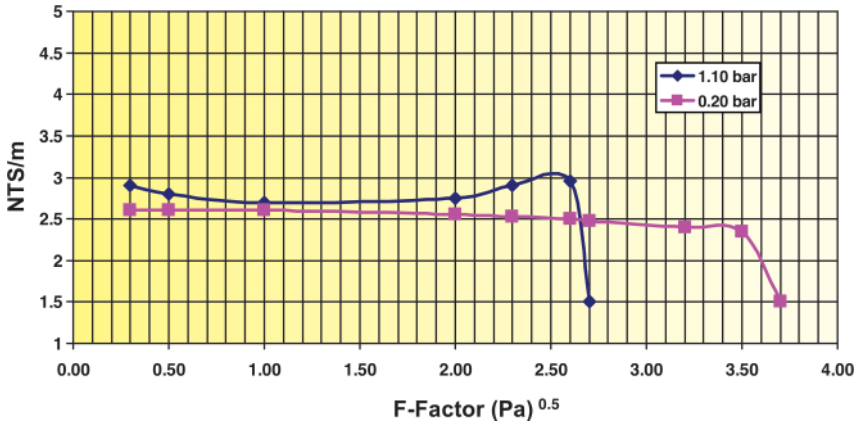


BARETTI STRUCTURED PACKING HIGH PERFORMANCE

BARETTI has developed a proprietary high performance structured packing since 2007:

- The conventional structured packing, installed with each layer rotated in respect to the previous one, suffers a premature flooding where the two layers touch each other.
- This phenomena is caused by the sudden change in direction of the flow who creates a localized pressure drop.
- The end of each diagonal channel of the BARETTI High Performance Structured Packing is formed to avoid, almost totally, the sudden change in direction of the flow.
- This result in a vey significant improvement. The Baretti High Performance Structured Packing has gained more than 30% in capacity, lower pressure drop at same efficency of conventional structured packing at similar condition.
- The BARETTI High Performance structured packing is an excellent opportunity for increasing further the capacity of towers already packed with conventional Structured Packing

Structured Packing B - 250 - HC



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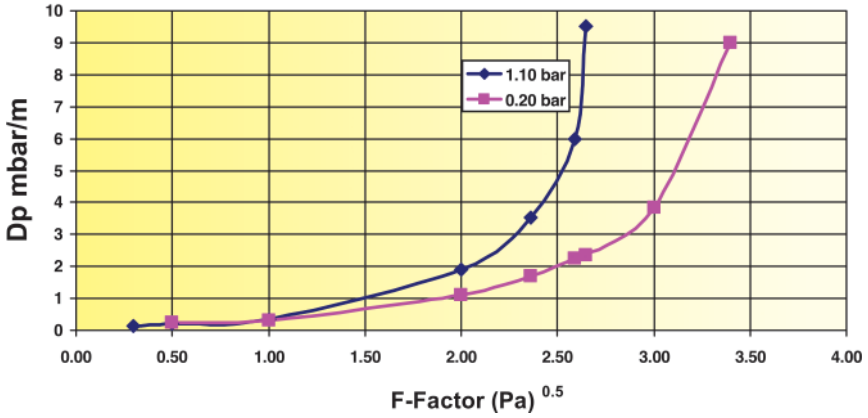
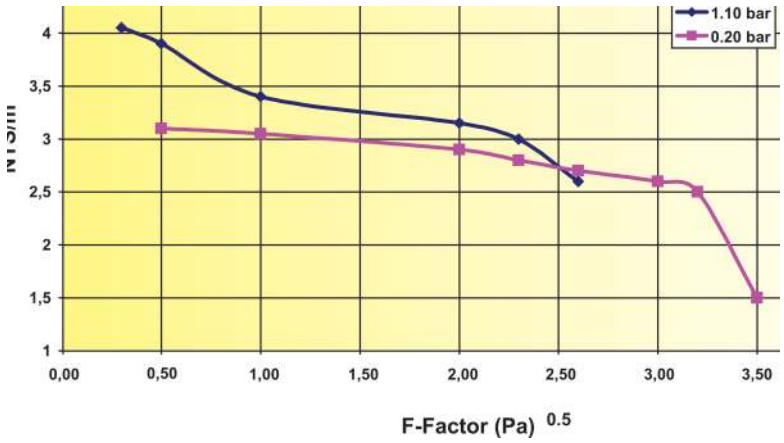


BARETTI STRUCTURED PACKING HIGH PERFORMANCE

Structured Packing B - 350 - HC



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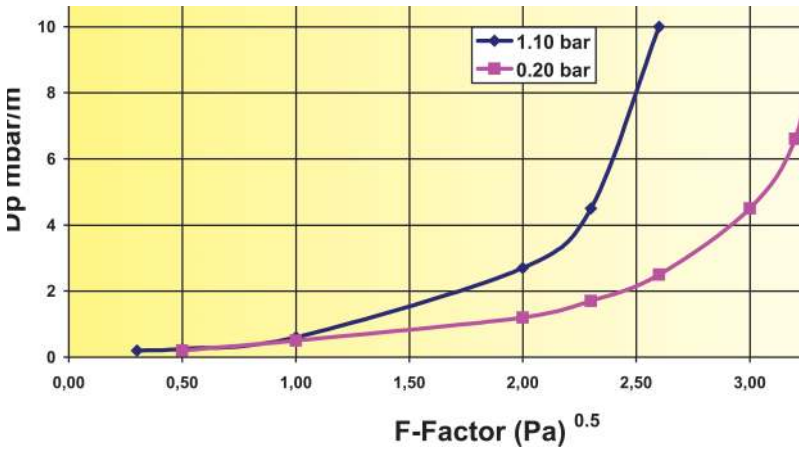
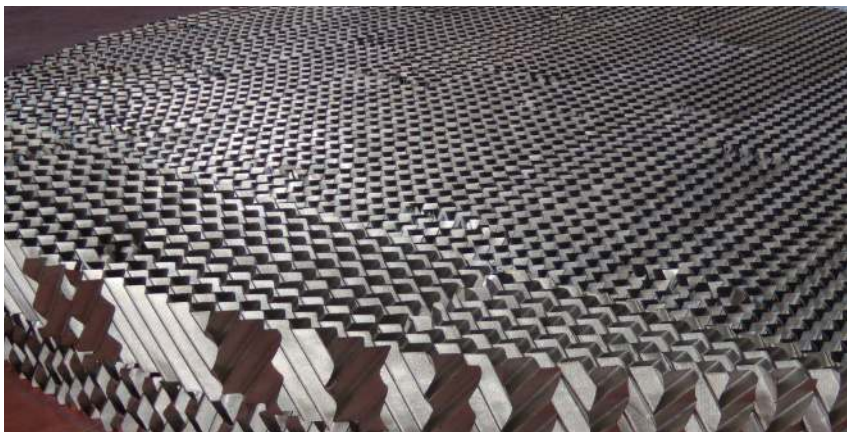
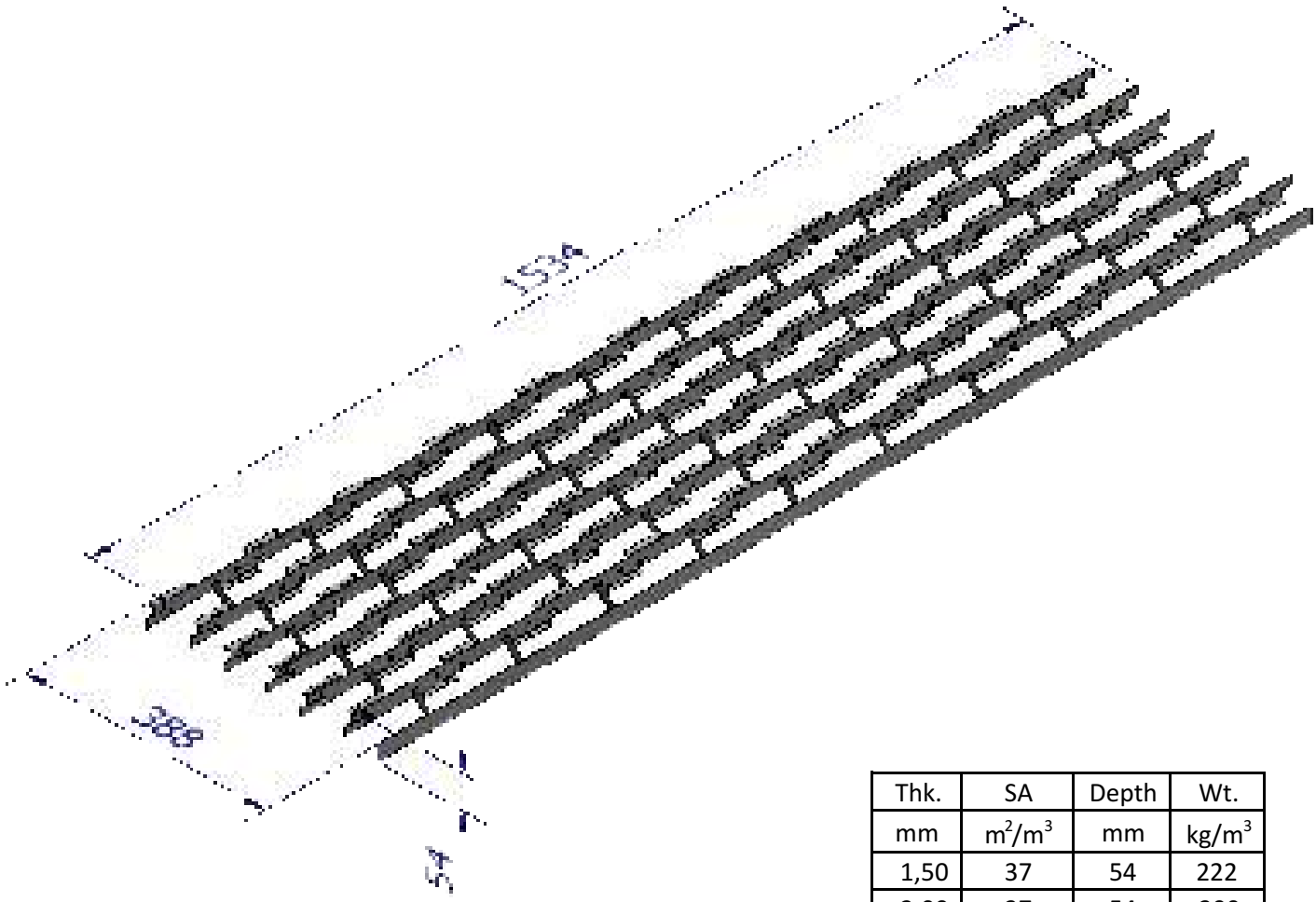




BARETTI GRID B-37

Baretti B-37 Grid is a fixed geometry packing with high open area, low pressure drop and low susceptibility to fouling, cooking and erosion.
The primary use is in the wash zone of heavy hydrocarbon fractionators with very severe operating conditions.



Thk.	SA	Depth	Wt.
mm	m^2/m^3	mm	kg/m^3
1,50	37	54	222
2,00	37	54	300

The panels are available in several stainless steel grades with thickness of 1.50 and 2.00 mm.
A bed of Grids consist of several layers of self-supporting panels. The shape and layout of the panels result in a flow pattern of the vapor upward enhancing the removal of heavy liquid and solid entrainment. The lower layer of the bed is clamped to the supporting ring and beams.
The other layer rest on top one another, each one rotated of 45 degrees to the one below.
Split beds of B-37 on the bottom and structured packing on the top are used where both high entrainment removal and some fractionation are required.
An extra resistence to upset is obtained with J bolts fastening together to the top three layers of grids.
No other hold-down device is needed.

BARETTI RANDOM PACKING

Baretti design and manufactures the most advanced random packing types:

Pall type rings

Pall Rings have replaced the Raschig Rings since long time due to their excellent results in many applications like:
Absorbers, Regenerators, Strippers and Scrubbers.

Baretti Metal Random Packing (BMRP)

BRMP replaced both Pall and Rashig Ring due to enhanced performances in terms of capacity, pressure drop and efficency.

Random packing has been used since early 40's as an alternative to tower trays. The main improvements achieved with modern packing are:

- Contrary to trays there is no need to split the column area in active area (bubbling zone) and the downcomer one. The vapour and liquid occupy the required section determined by the volumes and pressure drop.
- The capacity of the traditional packing is close to the one of the trays at atmospheric and high pressures. In vacuum systems the random packing is preferred for its lower pressure drop.
- As mentioned above the main characteristic of the random packing is a much lower pressure drop as compared to trays.
- The efficiency is quite constant across the full operating range.

Some possible problems that can be encountered with packings are:

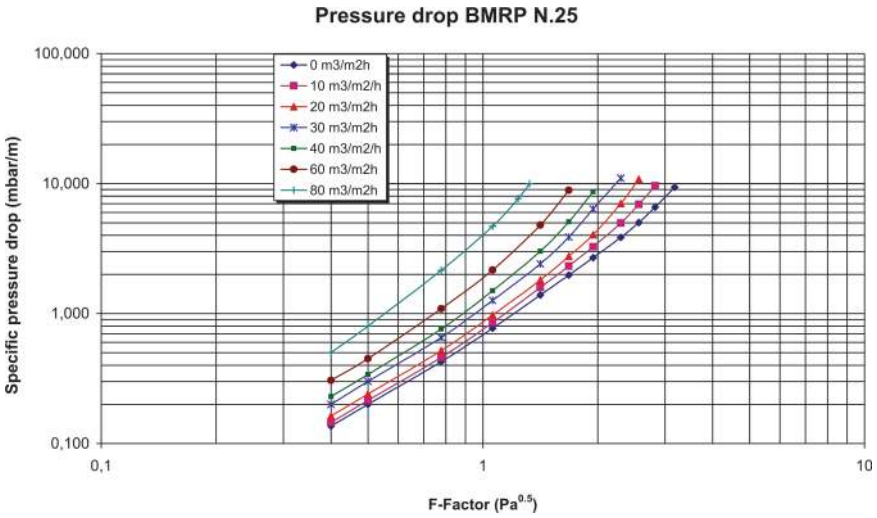
- A packed bed requires always an optimum liquid and gas distribution, the trays are much less sensitive at this point
- In fouling services the packing could plug and could be difficult to clear. If packing needs to be replaced it implies a substantial cost
- In case the tower shell needs inspection, the only possibility for inspection is to remove the packing
- In case of corrosive service the minor thickness of ring with respect to trays can be a problem

BARETTI RANDOM PACKING

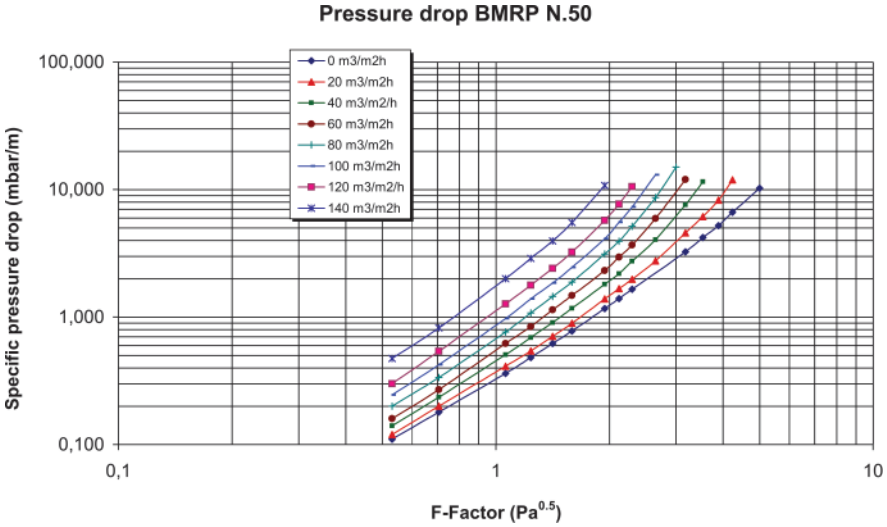
BMRP data chart

Dimensions	# 25	#40	#50	#60	#70
Specific Surface m²/m³	230	150	110	82	60
Number Pieces/ m³	130000	46000	14600	10500	4900
Packing Factor	440	250	195	170	130

Pressure Drop BRMP # 25



Pressure Drop BRMP # 50

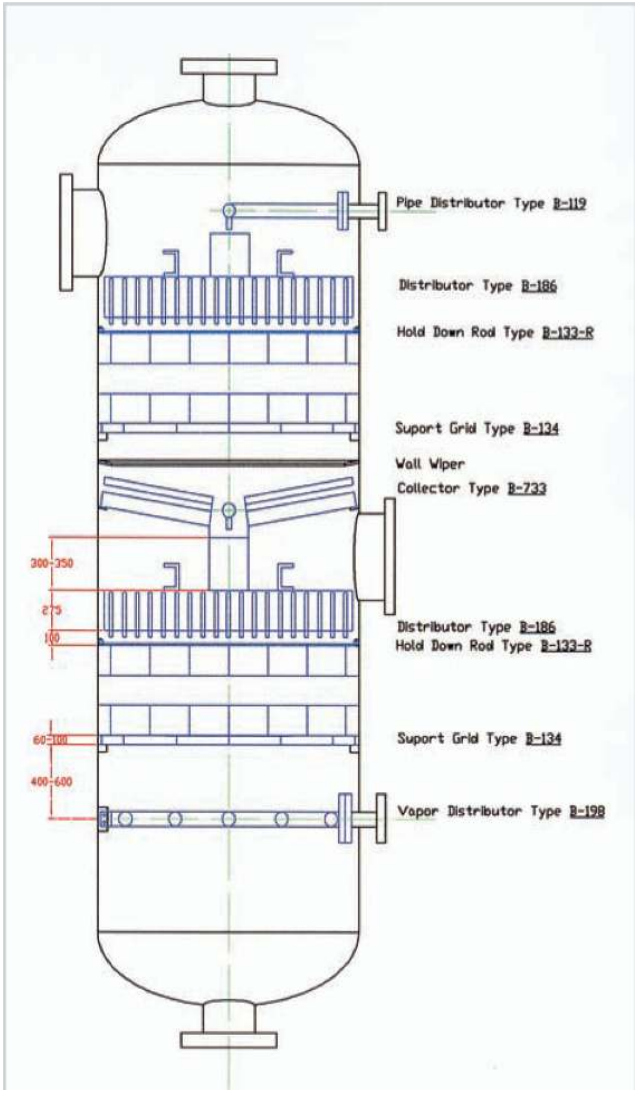


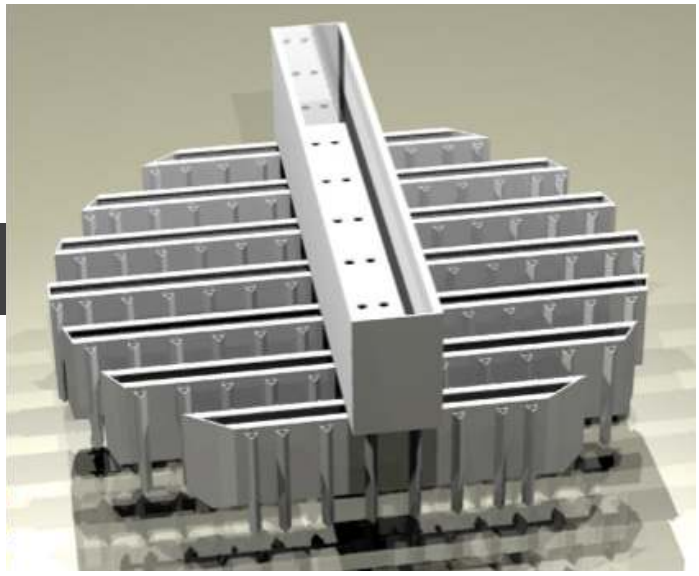
Baretti can supply **metal, plastic, ceramic and carbon rings** as requested by the project.
Other types of rings are available on request

TOWER INTERNALS FOR COLUMNS WITH PACKING

The performances of the packed beds strongly depends on:

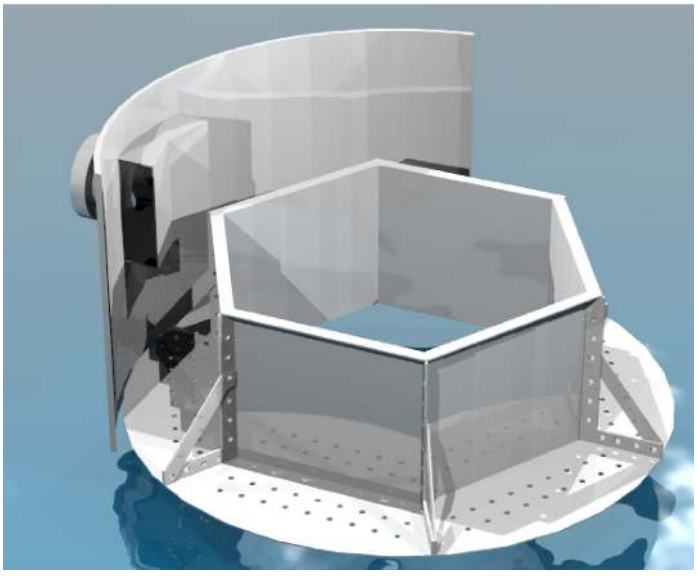
Typical Packed Column Arrangement





Liquid distribution

- Baretti B - 186 liquid distributor can be used For low liquid rates (< 30 - 50 $m^3/hr/m^2$)
- The maldistributoion (measured drip point to drip point)is less than 3% up to 8 meters column diameter



Gas distribution

- Baretti manufactored and design many type of Gas/Vapor distibutors
- The selection of appropriate distribution depends on capacity and services (full gas, mix, ore flashing

LARGE DIAMETER VACUUM TOWERS

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FRI Member

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