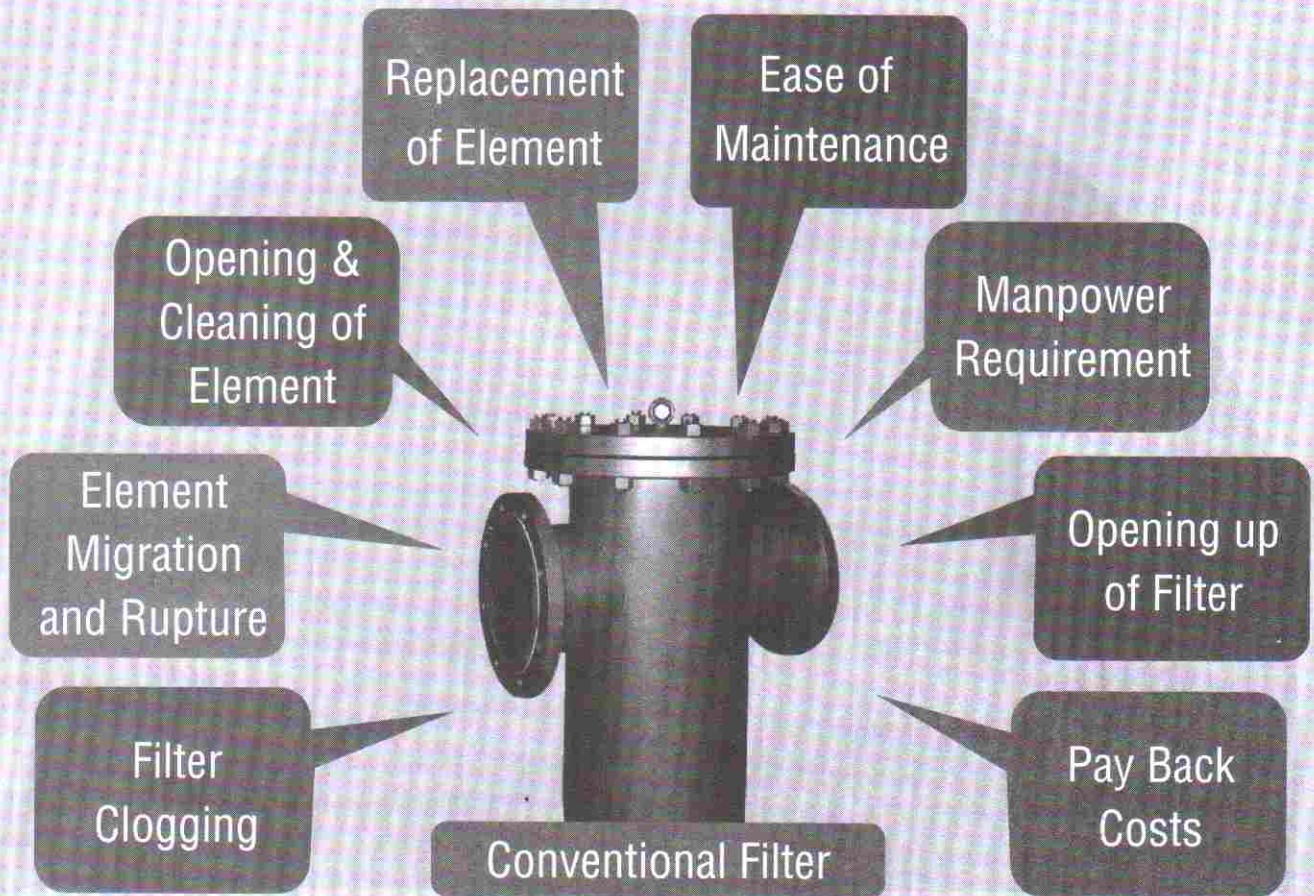




# SELECTION CRITERIA FOR NEW GENERATION BACKWASHABLE RIPBAC™ STRAINER



To avoid & eliminate the drawback shown above It's time to change Over to  
new RIPBAC™ Strainer

**ONE SOURCE – MANY SOLUTIONS  
ELL ESS ENGINEERING PVT. LTD**





Dear Readers,

Having completed 27 years successfully in the liquid solid separation field as a solution provider both for process & utility industries we have practically come across various types of problems the client encounters in a filter. It is also a fact that least importance is given in the industry for filtration application without realizing it also drains out profitability, if not solved. It is also true, when it comes to usage of Strainers & Filters, without realizing the design importance & unforeseen consequences it can create on the usage, people either install a wrong Strainer or altogether eliminates the same. Majority of the plant people do not realize the importance of Strainer and the various parameters to be considered in selection of Strainer in a pipe line.

In the last 27 years we have seen in number of plants, due the various difficulties the operator & maintenance people encounters with the Strainer, they either eliminate Strainer or remove the Strainer element from the body so that it acts only as a pipe. Even the filter manufacturers have only concentrated on high value critical filters & Strainers have been the most neglected ones as they are generally supplied by companies whose core products are either pumps, valves or metering devices & Strainers are just a complimentary product supplied to protect these devices.

We are giving below the various parameters to be considered in selection, installation & design of a Strainer one has to study & consider.

#### **Should you replace the wiremesh elements of your existing strainers by RIPBAC™ Screen?**

You **should**, if

1. you find your operators all the time carrying out repair job on the wiremesh filter element.
2. The process gets disturbed every now & then due to rupture of the wire mesh filter elements & need of reprocessing of slurry is quite frequent.
3. you observe that the need for wire mesh replacement in the strainer is quite often & resultant shutdown is a common feature in the plant.
4. you regularly hear that the strainer is off line because the wire mesh element is still under cleaning.
5. you find the wiremesh strainers lead to messy surroundings.
6. you find that the operators get so bugged by the strainer elements that they remove it once for all & retain only the housing on line & live happily thereafter.

In any industry the first preliminary filter installed for protection of the equipment are called strainer or filters.

#### **Frequently Asked Questions in selecting a Strainer**

- ◆ How Strainers Can Improve a Process?
- ◆ What is a Strainer?
- ◆ The Difference Between Strainers and Filters
- ◆ Why Open Area Ratio is Important?
- ◆ How to Choose the Right Strainer ?
- ◆ Selection of a Strainer
- ◆ A Good "Rule of Thumb"
- ◆ Don't Be Misled By Pipeline Size
- ◆ Application Considerations
- ◆ When to Clean elements

#### **How Strainers Can Improve a Process**

The problem of unwanted material in pipelines is a never ending one. Whether the flowing material is seawater, oil, paint or a variety of food or chemical products, there is often something present that can cause trouble. Dirt, foreign matter, or even lumps of the product itself can clog or damage pumps, spray nozzles, condensers, and similar equipment. Sometime a finished product has to be rejected because of the presence of undesirable solid matter. Strainers remove unwanted particles. Furthermore they are relatively inexpensive compared to the equipment they protect.

#### **What is a Strainer?**

"A closed vessel with cleanable screen element designed to remove & retain foreign particles down to 0.001 inch diameter from various flowing fluids." Note the term "foreign particles". Strainers do not necessarily remove only dirt. They take out material which is not wanted in the fluid and this can sometime be a valuable product which may be saved.

#### **The Difference Between Strainers and Filters**

What is the difference between a strainer and a filter? Actually there isn't any since a strainer is, in reality, a coarse filter. Generally it is assumed that if the particle to be removed is not visible to the naked eye, the unit is filtering, and if the particle is visible, the unit is straining. Normally in majority of applications in Strainer they use a minimum of 250 micron or 60 mesh element and above.

#### **Why Open Area Ratio is Important**

The open area ratio in a strainers is the ratio of the open area through the strainer element to the cross sectional



area of the pipeline. A well designed strainer should have an open ratio of at least 3 to 1. Anything less may cause excessive pressure drop. The ratio is calculated with a clean element and as the element begins to clog the ratio will drop. This will reduce flow through the strainer and necessitate very frequent cleaning.

### How to Choose the Right Strainer

The element is the heart of any strainer since this is where the unwanted material is trapped. Since in the conventional strainer the flow is from in to out wherein the solids get trapped inside the basket and for cleaning & removing the solid particles the strainer has to be opened, basket to be taken out for cleaning. To avoid the opening of the Strainer and to reduce the maintenance & manpower & spare part requirement EII Ess has invented the next generation back washable RIPBAC™ Clean in Place Strainer wherein the disadvantages exist in the conventional basket strainer are eliminated. In the new EII Ess Strainer the flow is from out to in due to the use of sturdy surface filtration RIPBAC™ screen wherein the solids gets deposited on the outer surface of the element. For cleaning using the CIP process the strainer has to be stopped for few seconds & by the backwash method the filtrate inside the strainer element will flow in the reverse direction through the V-Shaped profile wire. Due to the Venturi effect the solids deposited on the screen gets dislodged completely within few seconds & drains out as slurry through the drain pipe. Since RIPBAC™ screen are in metallic construction are suitable for high pressure & temperature applications. This also gives longer life to filter screen which drastically reduces the replacement cost. Due to the various advantages the pay back achievable from the new EII Ess Strainers are very fast as against the existing conventional strainers.

### Selection of a Strainer

The following items to be considered while selecting the proper strainer for an application :

- ◆ Material of construction.
- ◆ Designing and working pressures.
- ◆ Designing and working temperatures.
- ◆ Service of liquid
- ◆ Flow rate and viscosity
- ◆ Particle size to be retained.
- ◆ Debris loading.
- ◆ Seal material (o-ring or gasket).
- ◆ Whether the line flow can be interrupted or not for screen cleaning.
- ◆ Clean start up pressure.
- ◆ Location of the strainer

### A Good “Rule of Thumb”

Selecting the proper size strainer for a particular application is most important. Most reliable manufacturers have pressure drop information for all sizes. A general rule of thumb is that pressure drop through the strainer should not be greater than 2 psi. If it is, the strainer selected is too small. Factors such as viscosity, specific gravity, line size & slot size all influence pressure drop through the unit & they must be taken into account

### Don't Be Misled By Pipeline Size

The strainer size is not automatically the same as the pipe size. It may be larger. In the case of highly viscous liquids, for instance, where pressure drop through the element can reduce flow considerably. It is sometimes necessary to use a strainer several sizes larger than the pipeline in order to insure adequate flow. However, this is often desirable because aside from the slightly larger initial investment there are no subsequent added costs. Strainers with RIPBAC™ Screen last almost indefinitely and there is almost nothing to wear out.

### Application Considerations

The nature of the product also has an influence on the strainer size. Soft, gummy materials like tars and resins are more difficult to remove and clog the element more quickly than hard crystalline materials. In these cases, a larger strainer size is recommended. The size of a Strainer, therefore, is a function of the job to be done.

There are no industry standards on face to face dimensions for flanged basket strainers, such as there are for valves. For this reason, the strainer of one manufacture may not fit in a space designed for a different brand of strainer.

### When to Clean Baskets

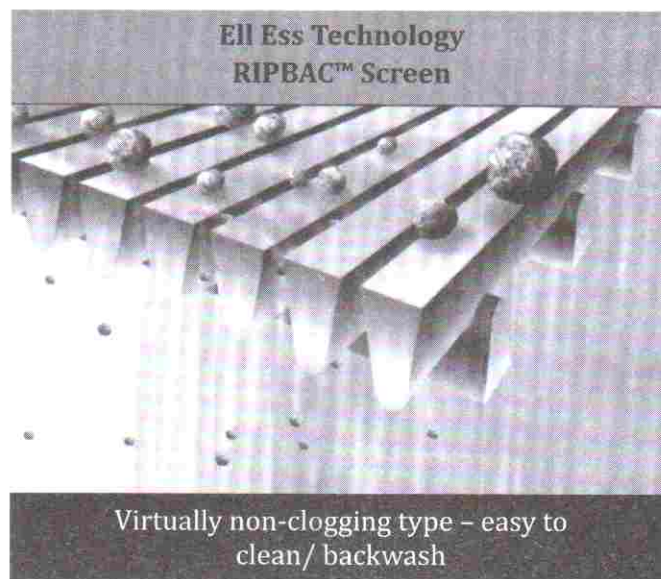
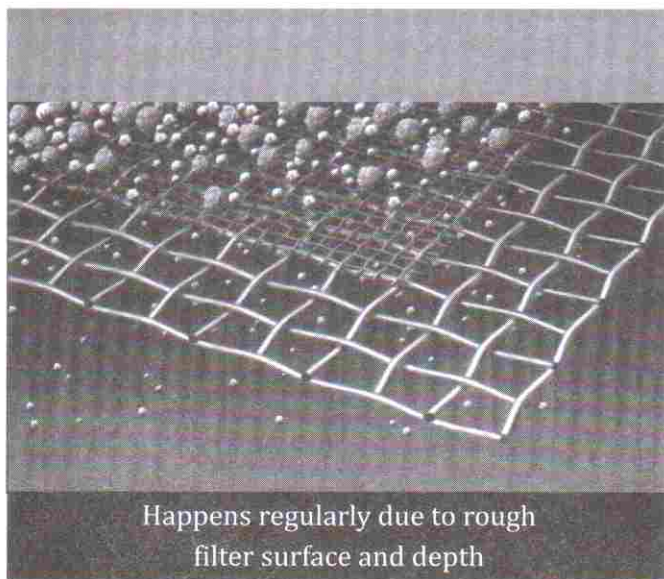
Strainer should be cleaned on a regular basis, not when they become clogged. Another reason for frequent cleaning is a phenomenon known as “runaway buildup”. As dirt in a strainer accumulates and as the element plug up, pressure drop increases. The curve of this pressure difference is not a straight line. It starts out as a low slope, but as the element clogs more and more it turns upward faster and faster. As the dirt builds up the free open area in the element gets smaller and smaller. It means that a good flow of liquid can reduce to a trickle or stop quickly. Good maintenance procedure dictates that elements be cleaned by backwash before they become clogged.





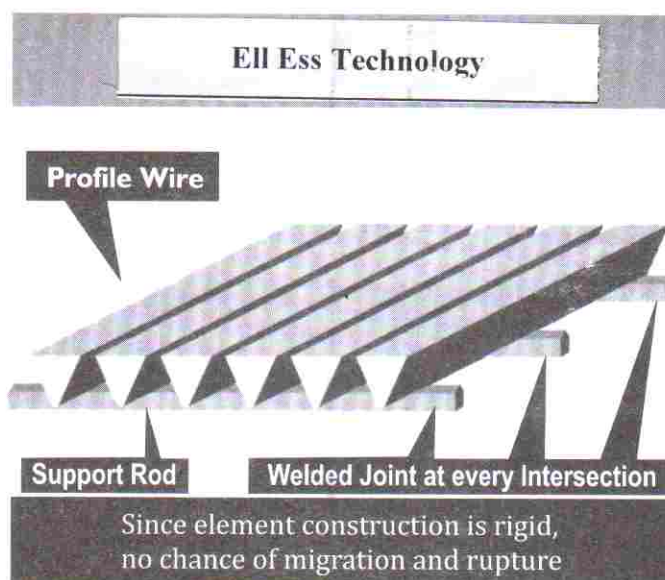
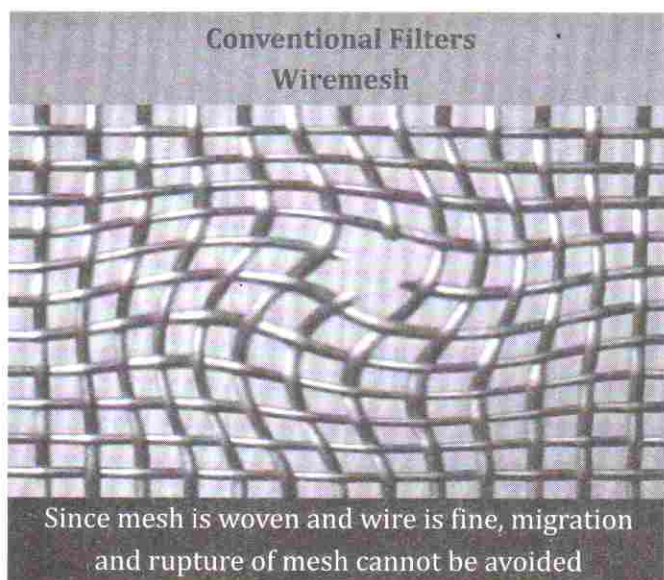
THE VARIOUS PICTURES OF WIRE MESH & RIPBAC™ SCREEN SHOWN BELOW ARE SELF EXPLANATORY ABOUT HOW A RIPBAC™ SCREEN ELEMENT ELIMINATES ALL THE DRAWBACKS EXIST IN A CONVENTIONAL STRAINER WITH WIRE MESH ELEMENT.

### FILTER CLOGGING



TWO POINT CONTACT OF SOLIDS WITH EDGES OF PROFILE WIRE OF RIPBAC™ SCREEN MAKES IT COMPLETELY NON CLOGGING FILTER MEDIA

### ELEMENT MIGRATION & RUPTURE



DUE TO RIGID CONSTRUCTION WITH WELDED JOINTS THE RIPBAC™ SCREEN DO NOT RUPTURE EVEN UNDER HIGH PRESSURE



## MAINTENANCE & MANPOWER

### Conventional Strainers/Filters



Maintenance oriented and manpower-inten

### Ell Ess Technology



Hardly any maintenance & manpower required

NO NEED TO OPEN THE FILTER FOR CLEANING, THUS NEGLIGIBLE MAINTENANCE & MANPOWER REQUIREMENT

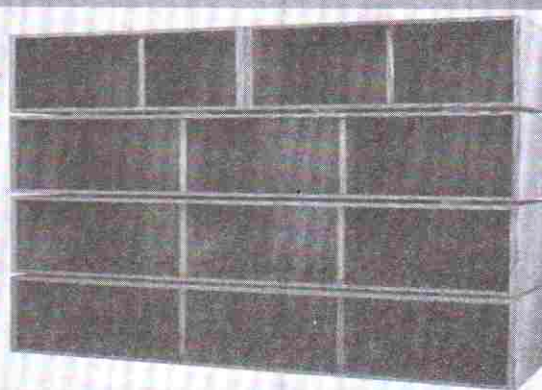
## REPLACEMENT OF ELEMENT & SPARES

### Conventional Strainers / Filters



Required very often.  
Need to keep stock of filter elements

### Ell Ess Technology



Not required for years  
No need to stock spare elements

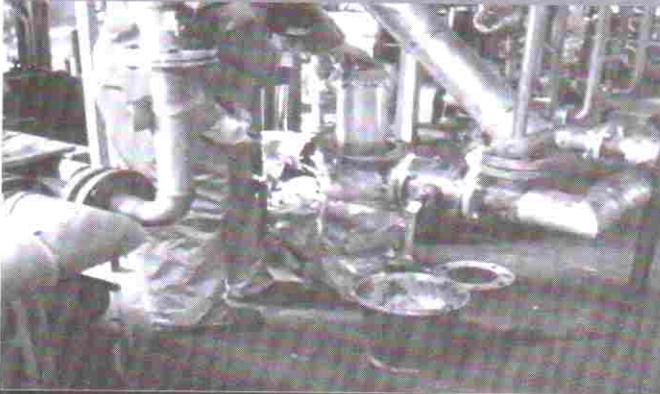
DUE TO RIGID CONSTRUCTION OF RIPBAC™ SCREEN, IT DOES NOT GET DAMAGED EASILY & AS A RESULT NO NEED FOR SPARES ELEMENT





## MAINTENANCE & MANPOWER

### Conventional Strainers/Filters



Messes up floor every time the element is cleaned – raises effluent loa

### Ell Ess Technology



No need to open up filter for months together

IN-SITU CLEANING ENSURES CLEANER SURROUNDINGS & OPERATOR SAFETY IN CASE OF RIPBAC™ STRAINER

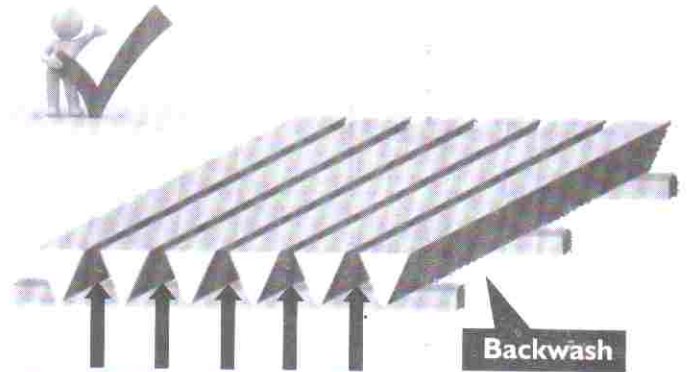
## CLEANING OF ELEMENT

### Conventional Filters



Needed at regular intervals – sometimes in less than a shift

### Ell Ess Technology



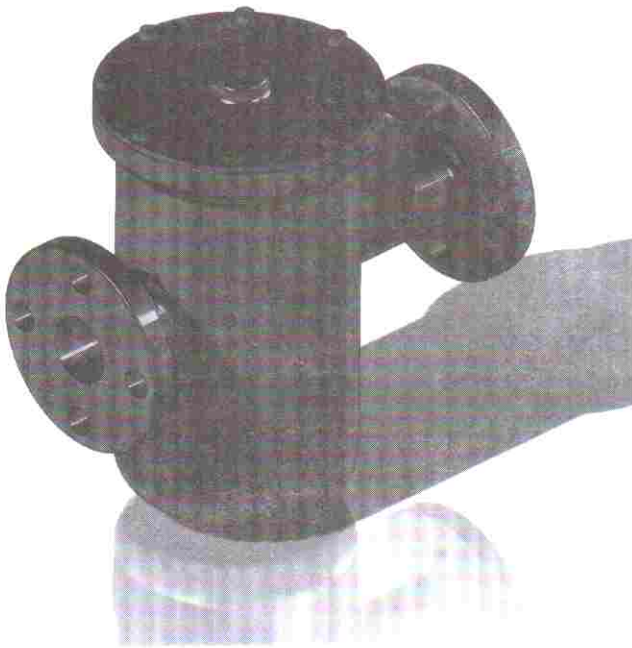
No need at all since backwash feature built in

CLEAN-IN-PLACE & BACK WASHABLE DESIGN OF RIPBAC™ SCREEN HELPS IN EFFICIENT CLEANING



### **Back Washable RIPBAC™ -C Strainer**

ELL ESS has introduced for the first time to the industry back washable RIPBAC™ -C Strainer to protect pipe line equipments like pumps, nozzles, flow meters and process equipments. The new generation ELL ESS Strainers can be used in liquid handling installations where the flow can be shut off for short periods (few seconds) for cleaning the Strainer by back wash without opening and removing the filter elements.



#### **Size and End Connection:**

Flanged & Screwed : 20 NB to 65 NB

Flanged : 80 NB to 250 NB

**MOC:** Cast Iron, Cast Steel, Stainless Steel, Alloy Steel

**Pressure Rating:** 150# and 300#

**Element Slot:** 250 micron & above

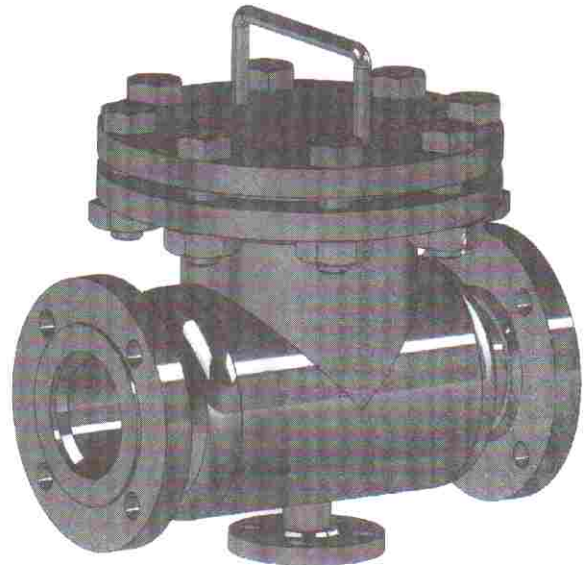
#### **Pressure Drop:**

- 0.02 bar in 100% clean condition

- 0.05 bar in 50% clogged condition

### **Back Washable RIPBAC™ -P Strainer**

When it comes to developing efficient, reliable, maintenance free large size Strainers no other company has more experience & as much to offer as ELL ESS Engineering. The back washable RIPBAC™ -P Strainer is semi sealed unit with compact design due to the fact the unit need not be opened for cleaning regularly & can be back washed efficiently using the filtrate liquid to regain the 100% filtration area.



The Strainer is suitable for filtration from 1000 micron & above particles. For higher flow rates, ELL ESS Strainer helps the end user, with compact size & instant cleaning. Due to the design and the positioning of the RIPBAC™ Screen, majority of suspended particles collects near the bottom drain point during operation & during back wash solid will be dislodged and drained as slurry within few seconds.

**Size and End Connections :** 200 NB to 800 NB with Flanged connection

**MOC :** Cast Iron, Cast Steel, Stainless Steel, Alloy Steel

**Pressure Rating :** 150# and 300#

**Element Slot :** 1000 micron and above

**Pressure Drop :** - 0.02 bar in 100% clean condition  
- 0.05 bar in 50% clogged condition





## **Back Washable RIPBAC™-Y Strainer**

Ell Ess has introduced for the first time to the industry back washable RIPBAC™-Y Strainer to protect pipe line equipments like pumps, nozzles, flow meters and process equipments. The Strainer is semi sealed unit with compact design and due to this, the unit need not be opened regularly & can be back washed efficiently using filtrate liquid itself to regain 100% filtration area which takes only few seconds. The elements are structurally strong & they do not collapse & get damaged during operation and the life is quite high.

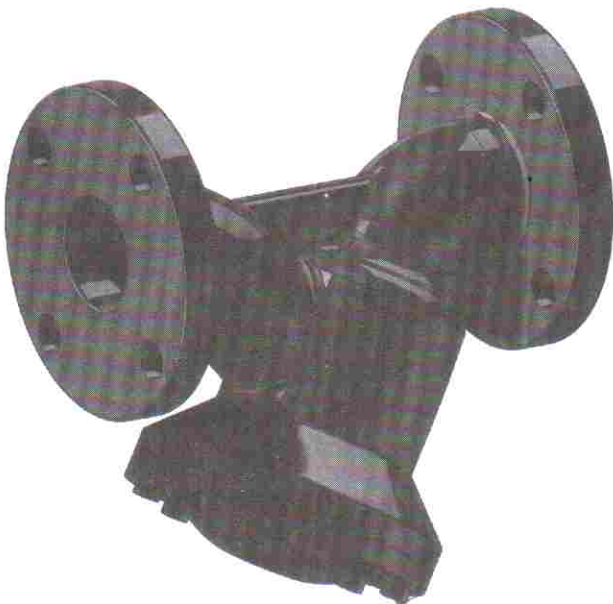
**Size and End Connections :** 20 NB to 80 NB with Screwed and Flanged connection

**MOC :** Cast Iron, Cast Steel, Stainless Steel, Alloy Steel

**Pressure Rating :** 150# and 300#

**Element slot :** 250 micron and above

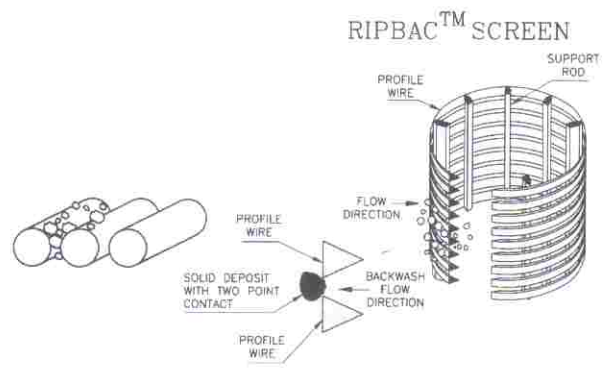
**Pressure Drop** - 0.02 bar in 100% clean condition  
- 0.05 bar in 50% clogged condition



For  
**PRIVATE CIRCULATION ONLY**

## **RIPBAC™ SCREEN FILTER MEDIA**

The figures shown below explain clearly the effect of two point contact of RIPBAC™ Screen :



### **SALIENT FEATURES OF RIPBAC™ SCREEN**

- ✓ Accurately defined slot openings to give – Precise Straining / filtration
- ✓ Venturi effect due to V-shape – Highly effective backwashing
- ✓ Fully Welded joints – no deformation under critical operating condition
- ✓ Rigid Construction – no extra backing support required
- ✓ Two point contact of solids during filtration – Surface filtration
- ✓ CIP back wash cleaning – to regain 100% filtration area

### **ELL ESS ENGINEERING PVT. LTD.**

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