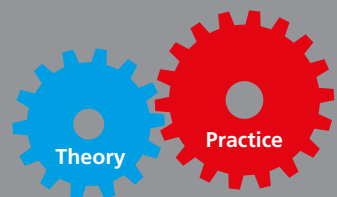


# High Quality Filter Elements

How can you recognize quality?

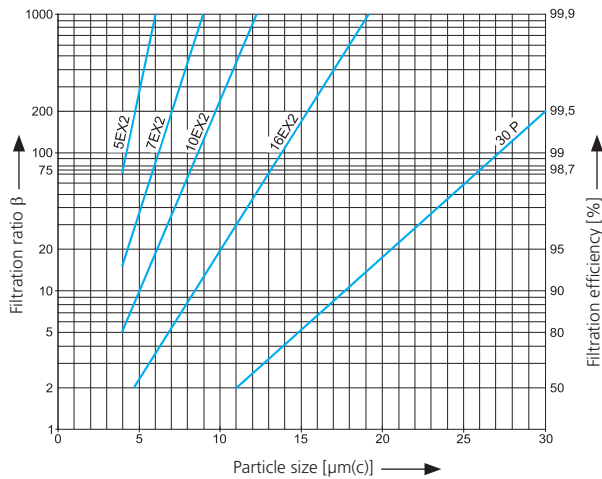


# Original Filter Elements with Constant Quality

## Five Performance Figures – Theoretical Principles

The filter elements of ARGO-HYTOS meet very high standards in terms of quality and process reliability. Only original parts guarantee a constantly high quality standard.

**We will show you what is important.** Do not make any compromises and keep your hydraulic system clean.

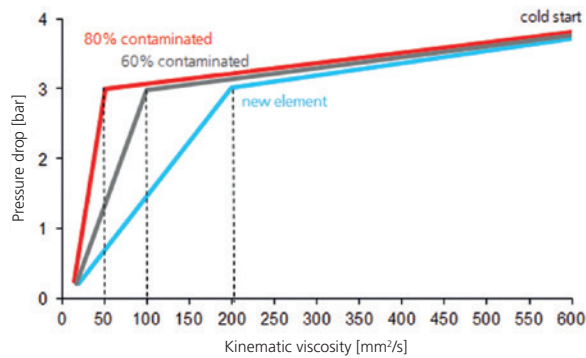


### 1. Filter fineness

**The beta value must be specified along with the filter fineness.**

Often contradictory or incomplete information is provided e.g.: 10  $\mu\text{m}$ ,  $\beta_{10}$ , 10  $\mu\text{m}$  nom. / abs.

Correct specification is:  $\beta_{10(c)} = 200$



### 2. Pressure drop

**Initial high pressure drop causes the cold start risk to increase.**

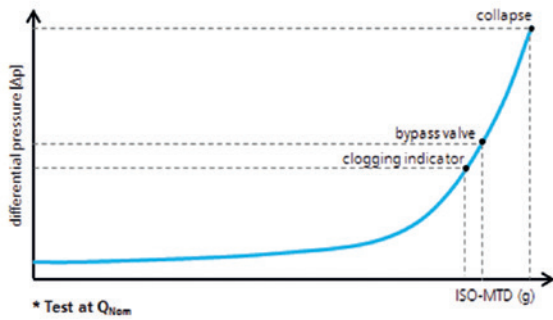
The bypass valve no longer closes or closes only at high operating temperature / low oil viscosity. During this phase, there is only a partial flow filtration, which allows dirt particles to pass without being filtered.

At which volume flow and which kinematic viscosity was the pressure drop  $\Delta p$  measured?



# Original Filter Elements with Constant Quality

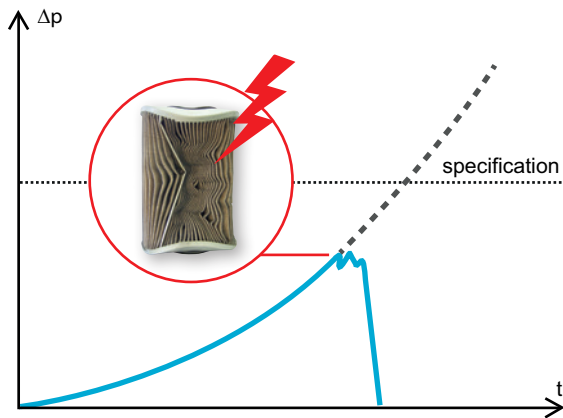
## Five Performance Figures – Theoretical Principles



### 3. Dirt holding capacity

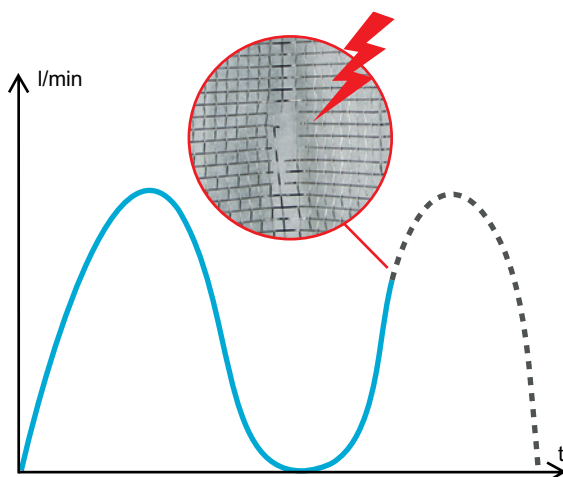
**At which final  $\Delta p$  was the dirt holding capacity measured in the multi-pass test?** At the response pressure of the clogging indicator, of the bypass valve or at collapse pressure?

**At which volume flow was the test carried out?** A significantly lower test volume flow compared to the volume flow in the application suggests high dirt holding capacity that cannot be achieved in practice.



### 4. Collapse pressure stability

**Early decline in filtration stability up to the point of burst / collapse of the filter element** due to insufficient stability of the perforated core or inadequate structure of the filter mesh pack.



### 5. Flow fatigue stability

**Inadequate protective and supporting fabric / fleece reduces the flow fatigue stability.**

Frequent flow rate fluctuations (e.g. in hydraulic systems with variable displacement pumps) may cause failure in the structure of the filter mesh pack, thus leading to uncontrolled dirt ingress in the hydraulic system.





# Selection and Processing Quality of Filter Materials and Individual Components

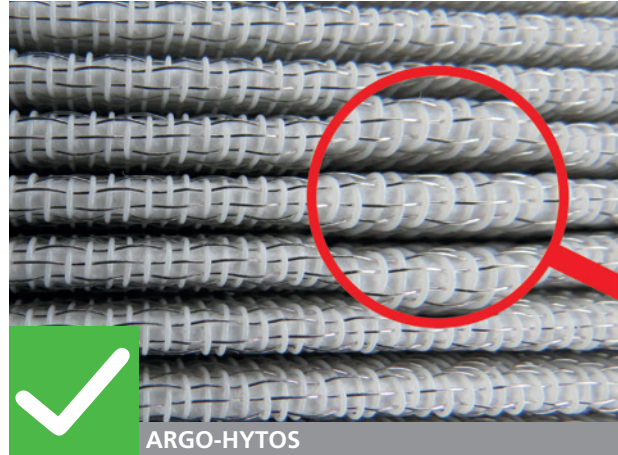
It all depends on the combination of the individual filter layers



Brand X

**Poor reversed bending properties** of screen fabrics can lead to structural damage of the mesh pack, i.e. metal pieces get into the hydraulic oil.

**Coating particles detach during the folding process** of protective and supporting fabrics, which are coated with epoxy resin to protect against corrosion.

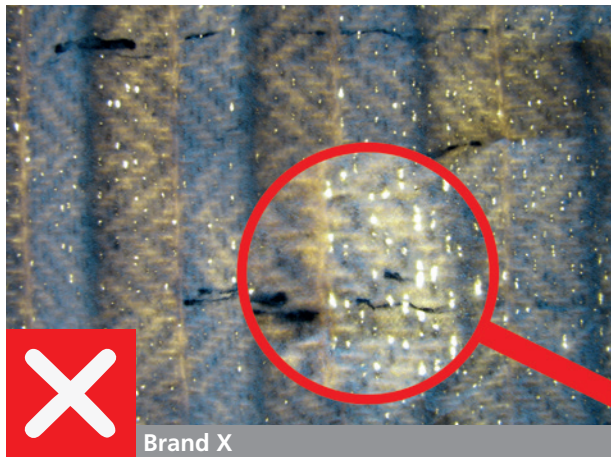


ARGO-HYTOS

ARGO-HYTOS filter elements are made of a patented **hybrid fabric**. This consists of **polyester warp wire** to improve the flow fatigue strength and **stainless steel weft wire** to support and hold the pleats open for incident-free flow.

**No paint is needed**, since the hybrid fabric is stainless.

## Structure of the filter bellows



Brand X

**Damaged fine filter material due to poor quality and missing support.**

The filtration efficiency of dirt particles is reduced significantly and compromises the achievement of the desired oil cleanliness of the hydraulic system.

**Electrostatic discharge is more likely due to the missing property of charge equalization.** This can destroy the filter fleece - in particular when using oils of low conductivity (< 500 pS/m).



ARGO-HYTOS

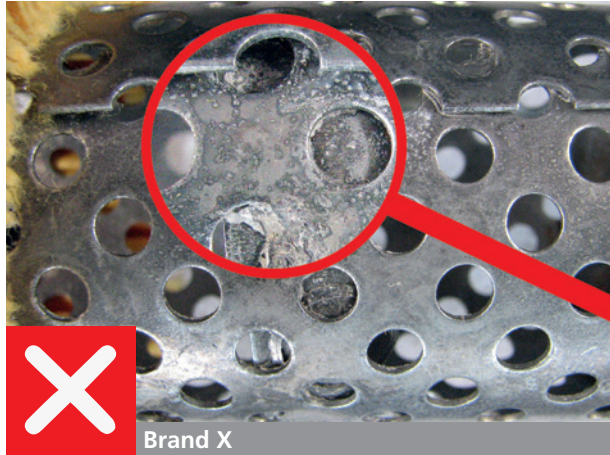
ARGO-HYTOS filter elements have a **two-layer main filter material**. The **pre-filter / fine-filter layers** serve to gradually separate dirt particles from coarse to fine. The protective fabric protects the filter fine layer and improves the differential pressure stability and flow fatigue strength.

ARGO-HYTOS „Spark Protect“ filter elements offer **protection against electrostatic discharge by means of a conductive mesh pack structure.**

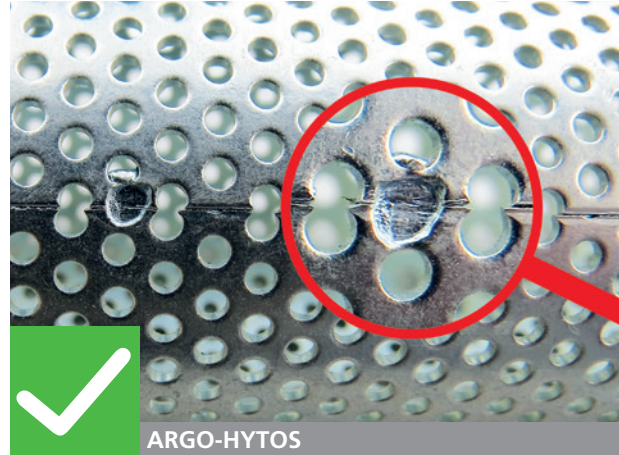


## Selection and Processing Quality of Filter Materials and Individual Components

### Processing quality of the support tube

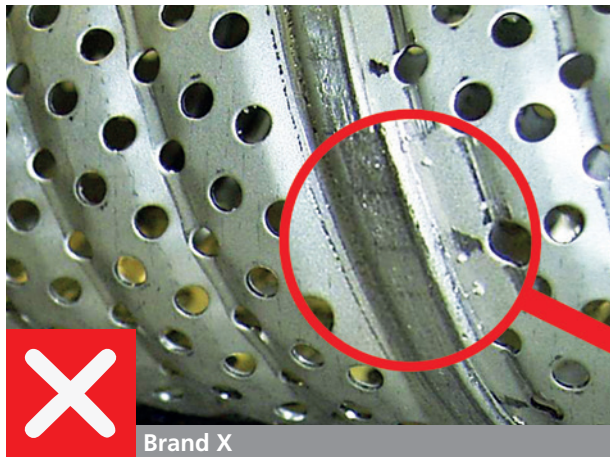


**Damage of the filter mesh pack** caused by support tubes with **sharp punch burrs, overlapping edges or welding beads**.

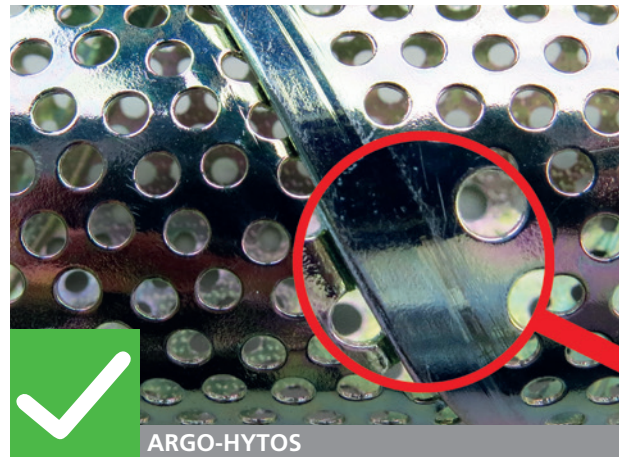


The support tubes used with ARGO-HYTOS filter elements, are **free from burrs, sharp edges or welding residues**.

### Spiral cores



**Premature failure / damage of the filter material** due to support tubes with **oversized perforation, punch burrs or gaps** in the support.



The spiral cores used at ARGO-HYTOS **do not show corrugations in the seam**. They have a **fine perforation** and the **punch burr** is on the **side facing away from the filter material**, in order to avoid damage.





# Selection and Processing Quality of Filter Materials and Individual Components

## Surface vs. embedded longitudinal seam bonding



The **missing of embedding** of the **mesh pack ends** may lead to **leakages** and **loose threads and fibers**. The **ends of the filter mesh pack** are only **laminary bonded** and not completely enclosed with glue.

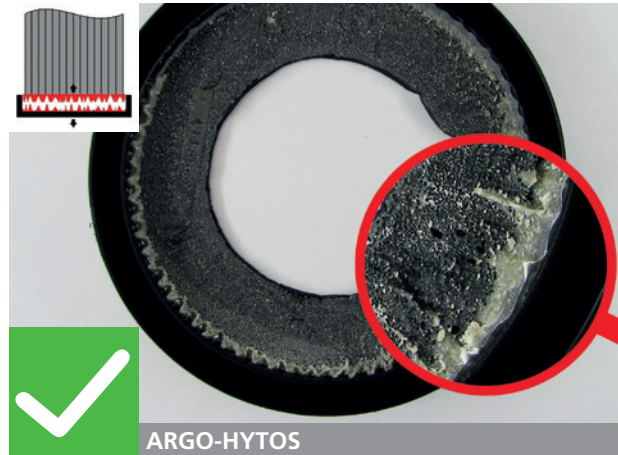


**Full embedding of the cutting edges** in the bonding of ARGO-HYTOS filter elements increase mechanical stability and the ends of the filter mesh pack are 100% tightly connected.

## Bonding of end plates



**Unintended, flat detachment of the end caps** and **growing risk of leakage** caused by **inadequate pre-treatment / degreasing** of the surface, **too low amounts of adhesive** or **inadequate adhesive properties**.



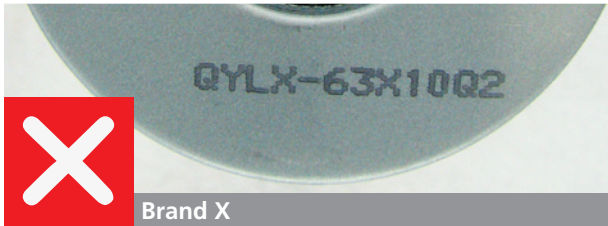
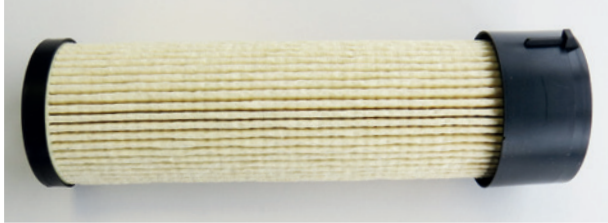
At ARGO-HYTOS, **metal end caps are degreased** and **plastic discs are plasma-treated** before being glued. Additional security is achieved by means of a **form closure** in the end cap.



## Filter Elements

# Selection and Processing Quality of Filter Materials and Individual Components

### Labeling of filter elements



Brand X

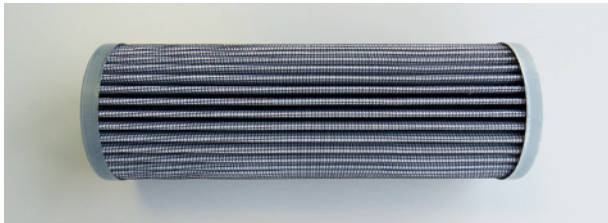
**Insufficient product labeling** makes product identification impossible, even after a short period of use. The **ink** used for labeling the end caps is often **not oil resistant** and is **washed off** within a short period of time. In many cases the **labeling is entirely missing**.



ARGO-HYTOS

All ARGO-HYTOS filter elements are labeled by laser inscription. **Customized printable shrink sleeve and packaging** provide a high recognition value and offer protection against mechanical damage during element change.

### Packaging, transport and storage protection thanks to folding boxes with safety lock



Brand X

**Improper packaging** leads to **dirt ingress and damage of the element**. The **missing film tube** often leads to dirt ingress, especially with fiberglass elements. **Cardboard boxes** with an **insufficient wall thickness** are unstable. Thus the packaging or even the element may be damaged during transport or storage. Without **safety labels** the new / unopened product condition cannot be ensured.



ARGO-HYTOS

**ARGO-HYTOS fiberglass filter elements are delivered in a film tube** to avoid dirt ingress during shipment and storage. **High quality cardboard boxes** guarantee safe transport and storage / handling. The **label used** bears a **QR code**, serves as a **closure seal** and thus ensures the new / unopened product condition.



## Know-how, Quality and Service - Your Benefits at a Glance



### Did you know that ...

- › fresh oil can often contain 10 times more dirt particles than are acceptable for hydraulic systems of high technical quality?
- › if the operating pressure is increased by only 50 %, the number of dirt particles in the oil must be reduced by a factor of 3 to avoid a deterioration in the lifetime of the components?
- › even a filtration quotient of  $\beta = 200$  corresponds to filtration efficiency of 99.5 % for all dirt particles that are larger than the specified size, and a  $\beta$ -value of only 10 still corresponds to 90 % efficiency?
- › even oil sample bottles declared as “clean” can contain considerably more dirt particles than the examined oil, if it comes from hydraulic systems with good filtration?
- › a lifetime of 1,000 service hours for a hydraulic filter corresponds to a mileage of about 60,000 km of a passenger car?
- › only an online count can determine the actual values for cleanliness classes  $< 10$  (ISO 4406)?



### Quality, safety and experience

ARGO-HYTOS operates testing rigs that are equipped with ultra-modern technology, enabling fast test sequences, extended testing procedures and accurate documentation of all the parameters:

- › Multi-Pass test rig
- › Collapse / burst pressure test rig
- › Test rig to determine the pressure drop
- › Test rig to prove the flow-fatigue resistance characteristics
- › Pressure pulse test rig to confirm fatigue strength

ARGO-HYTOS therefore offers tested quality and safety from A-Z.



### Global presence - Our services for you

The focus of the company philosophy of ARGO-HYTOS is a holistic support of our customers – beginning with the design of practically-oriented solutions over product development and manufacturing to comprehensive after-sales service.

ARGO-HYTOS is internationally represented with numerous own sales companies. In addition, we co-operate in all important key core markets with a large network of competent sales and service partners and thus ensure customer proximity and local presence. Through our specialists all around the world you always have a reliable contact person at your side.

[www.argo-hytos.com](http://www.argo-hytos.com)