



Troubleshooting Combustion Turbine Inlets

Filter House Preparation

Turbine Cartridge Filters

Proper Yoke Rotation & Yoke Bolt Inspection



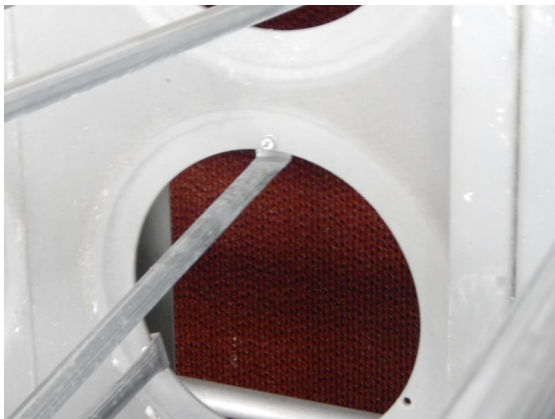
Tube sheet inspection is required for a good gasket seal.



The yoke in this picture is installed incorrectly. The sequence is wrong and therefore can cause bleed-by.



The yoke in this picture is installed correctly. See how the leg neatly covers the other two.



Filter-Doc Corporation

303 East Brooks Road
Memphis, TN 38109

Phone: 901.396.3625
Email: Robert@filter-doc.com

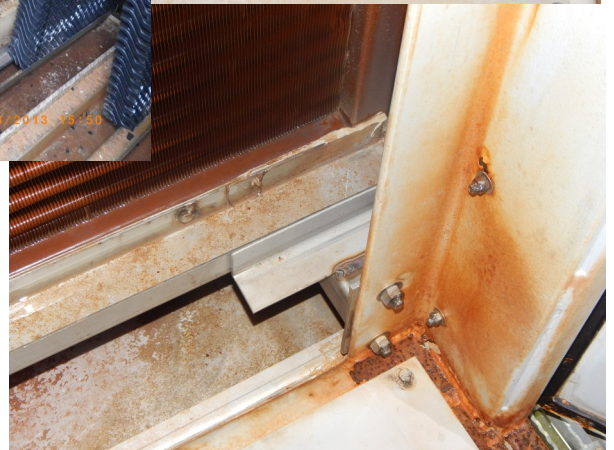
Fax: 901.396.3627
Greg@filter-doc.com

Filter House Preparation

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Inlet Clean Air Side—Rust & Corrosion

Rust and corrosion must be addressed. If it is not, manufacturer should strongly consider voiding the warranty.



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Clean Air Side—Miscellaneous Troubleshooting

Do Not introduce foreign objects to turbine after filtration!!



Oily Compressed Air.



Water caused by roof leaks.



Rust & Corrosion.



Door Seal.



Transition Trench.



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Misalignment



Problem

Misalignment of filters results in improper sealing of the gasket which causes bleed-by.



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Correcting Misalignment with Alignment Rings



Solution of Mis-Alignments

By using Filter-Doc Corp's designed Alignment Rings, the sets of filters can be correctly aligned allowing both gaskets to properly align, making an air-tight seal between filters and filter wall.

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Alignment Rings after Installation



Solution
Filters installed using Filter-Doc alignment rings.



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Greg@filter-doc.com

Filter House Preparation

Turbine Panel Filters



2-Point Hardware



Typical Braden T-Grid with 2 Point Hardware.



By Pass.



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Memphis, TN 38109

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Fax: 901.396.3627
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4-Point Hardware



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303 East Brooks Road
Memphis, TN 38109

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Email: Robert@filter-doc.com

Fax: 901.396.3627
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T-Grid



Problem

With increased air flow and multiple GE modifications that are available at this time, it can result in bowing of the existing T-grid which will allow bleed-by. Reference next page for examples.



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Memphis, TN 38109

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Fax: 901.396.3627
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Bleed-By

Problem

This is a Braden inlet with 4-point hardware and T-Grid in front of a GE 7F.05 upgrade. The framing is insufficient between the clean side stand offs. Please refer to previous page for examples T-grid.



Solution

We suggest replacing the T-Grid with vertical columns to be 2" SS 11 gauge with 1/4" flanges at floor and ceiling. The vertical tubing to be stabilized with 2" SS tubing from each floor level out to tubing. This mitigates the need for extensive hardware for 4-point mounting.



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Email: Robert@filter-doc.com

Fax: 901.396.3627
Greg@filter-doc.com

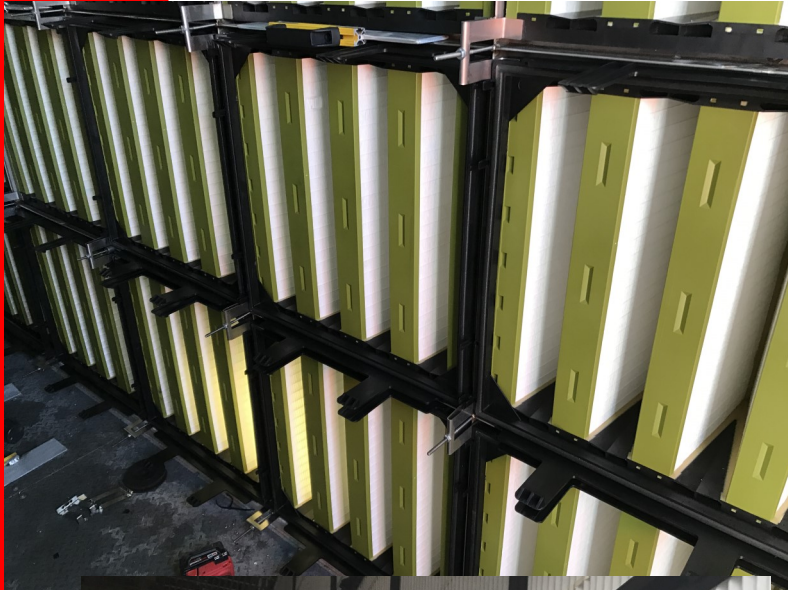
Filter House Preparation

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Filter

Replacement Filter-Doc mounting
hardware Pre-Filter Frames



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303 East Brooks Road
Memphis, TN 38109

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Email: Robert@filter-doc.com

Fax: 901.396.3627
Greg@filter-doc.com

Filter House Preparation

Turbine Panel Filters



Outside Mount Pre-Filter Frames



Solutions

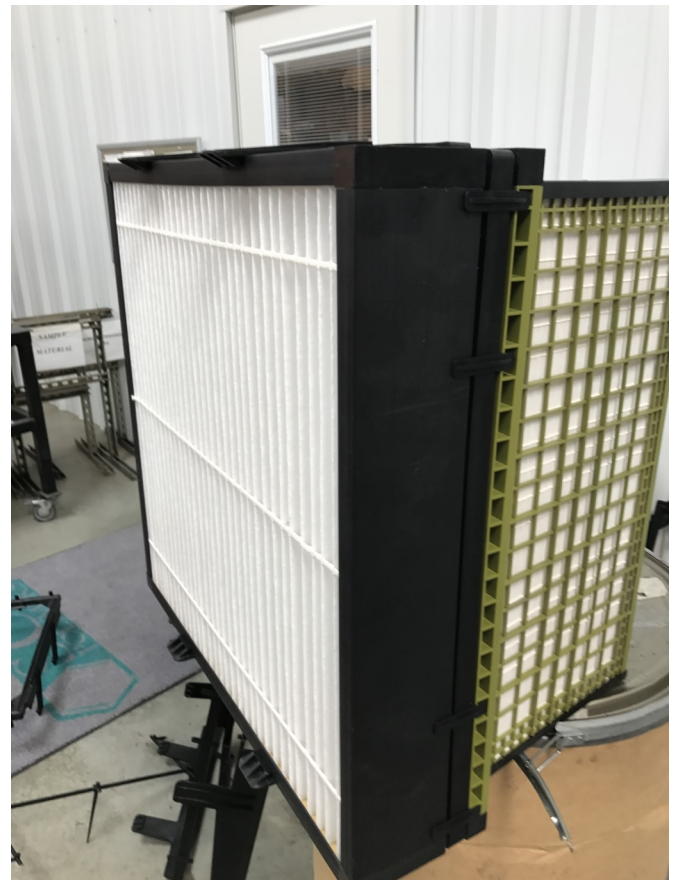
It has always been a problem to mount a good filter in front of an expensive "Final Filter".

Solution: Outside Mount Pre-Filter Frames.

This frame holds the 4" thick pre-filter securely to the final with gaskets poured on both sides of the frame to make an air-tight fit between the pre and final filters.

Solutions

With the Filter-Doc Corp. designed Outside Mount Pre-Filter Frames, the customer can easily change pre-filters.

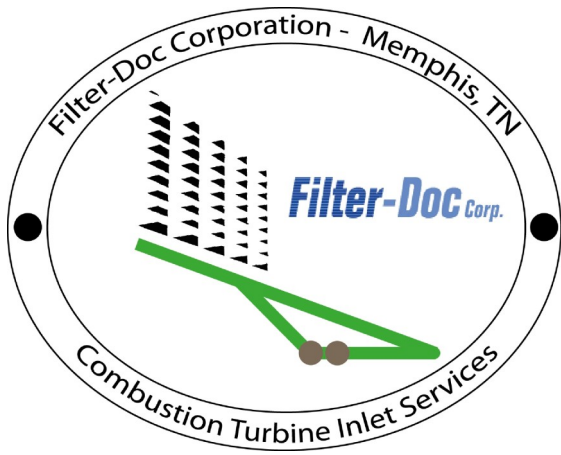


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Memphis, TN 38109

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Email: Robert@filter-doc.com

Fax: 901.396.3627
Greg@filter-doc.com



Air Inlet Installation & Inspection Report

Site Name: FP & L Plant Sanford
950 S. Highway 17-92
DeBary, FL 32713

Prepared by: Greg Murphree, Filter-Doc Corporation
Date of Inspection: December 2015
Designation: 5B CT Inlet Duct & Filtration Inspection
4D & 4C Inlet Inspection and Cleaning
Filter House Manufacturer: Braden
Filter Quantity: 320 New Hydrophobic Static Filters (Gore)



Executive Summary:

The air inlet filter house inspections show the filter inlets are in poor condition. The filter walls are in fair condition and inlet floor in poor condition. The filter T-Grid and hardware appears in good condition.

Unless noted, this report covers 5B, 4C and 4D. Filter house noteworthy observations are:



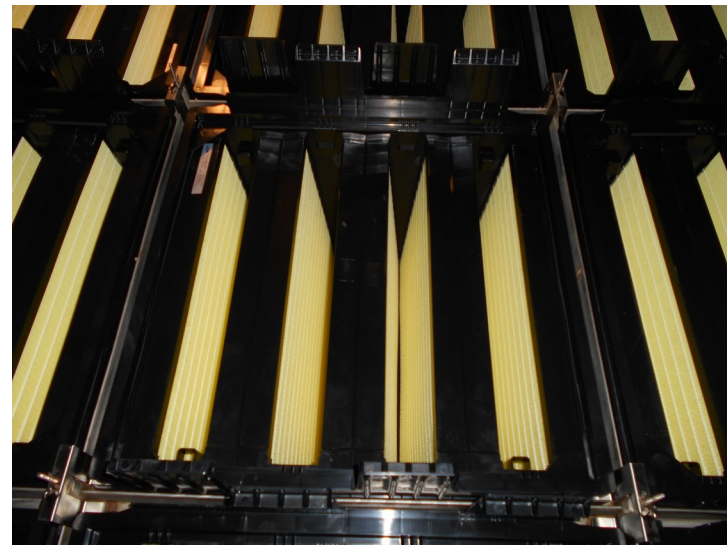
5B: Bleed by caused by bent T-Grid. Repaired by Filter-Doc before installation of new filters.



5B: Fogger system inspected and in fair condition.



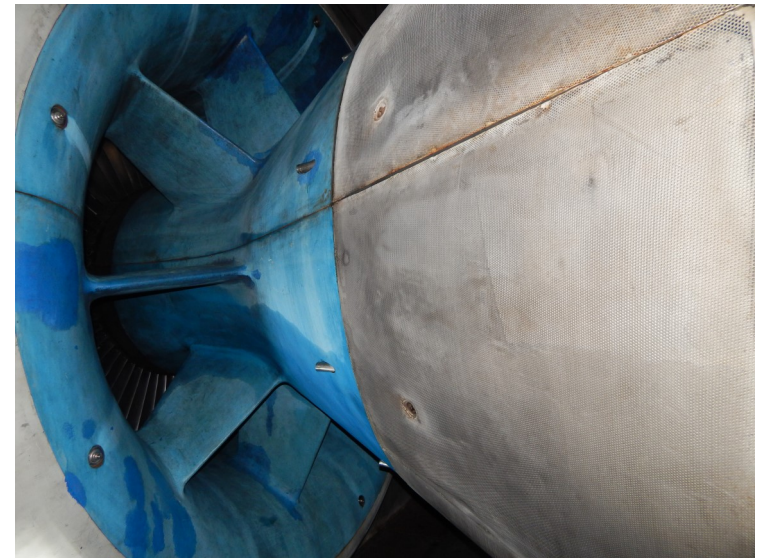
5B: All anchors inspected and repaired prior to installation of new Gore filters.



5B: New filter installation.



5B: Downstream leaks at front and back side of silencer section flanges. Cleaned and repaired by Filter-Doc.



5B: Bellmouth inspection.

Bellmouth in fair condition with light flaking. Cleaned and wiped down by Filter-Doc.

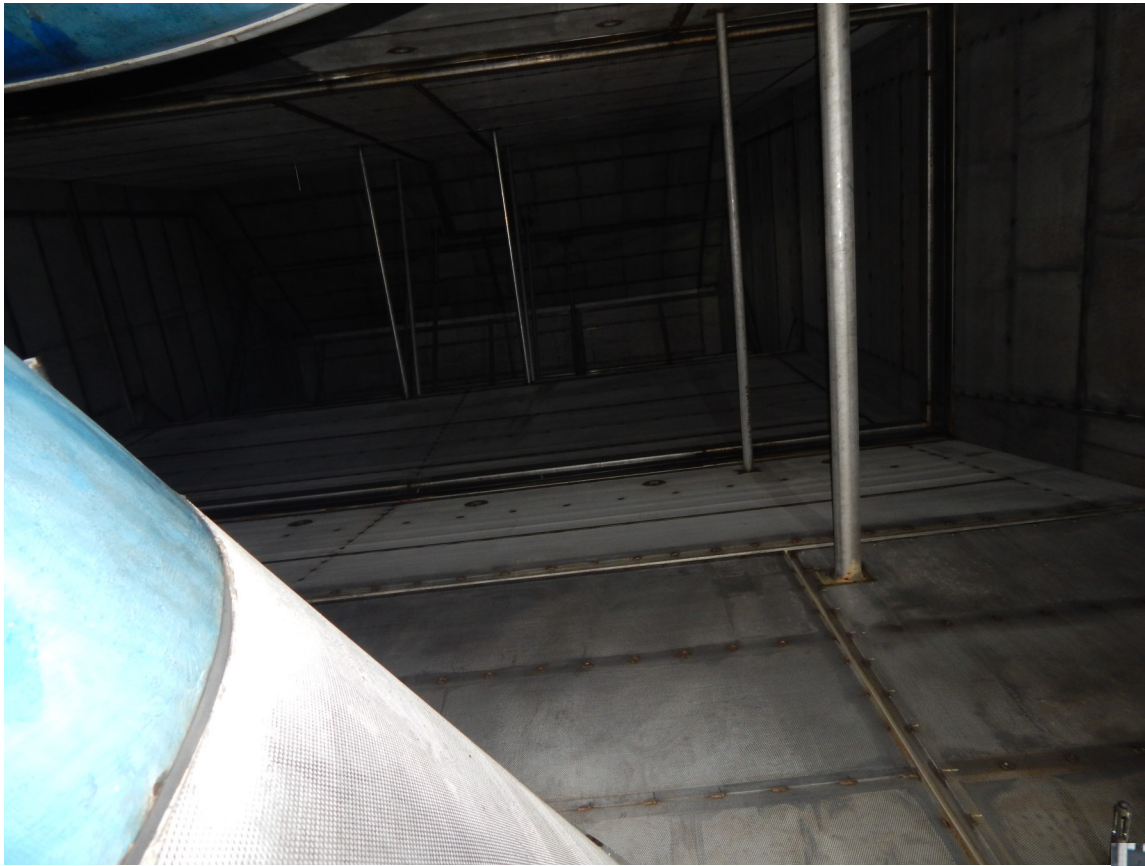


5B: Bleed heat/black side of silencer inspection.

Flaking paint and rust. Scraped and vacuumed per FP & L's instructions.



5B: Duct screens inspected. Little to no debris, small flakes of paint.



5B: Inlet duct inspection. Duct in very good condition. No light bleed through or debris.

5B: Inlet door to fogger area. Bad gasket replaced by Filter-Doc.



Units 4D and C Inlet Inspection and Cleaning

Executive Summary:

The air inlet filter house inspections show that the 4C and 4D filter inlets are in poor condition with corrosion, rust and flaking paint. From visual inspection, each T-Grid is stressed and bowed, but appear to be in good condition.

Filter house noteworthy observations are:



4D: Inlet pre-filters in fair condition. Return hardware inspected and in good condition. Dirty side inlet floor dirty and rusting.



4C & 4D: Dirty air side after inspection. Cleaned and scraped by Filter-Doc.



4C & 4D: Fogger system visually inspected. Looks to be in good condition.



4C & 4D: Back side of silencer had flaking paint. Filter-Doc scraped and cleaned per FP & L.



4C & 4D: Bellmouth typical in each inlet. Dirty with minor flaking.



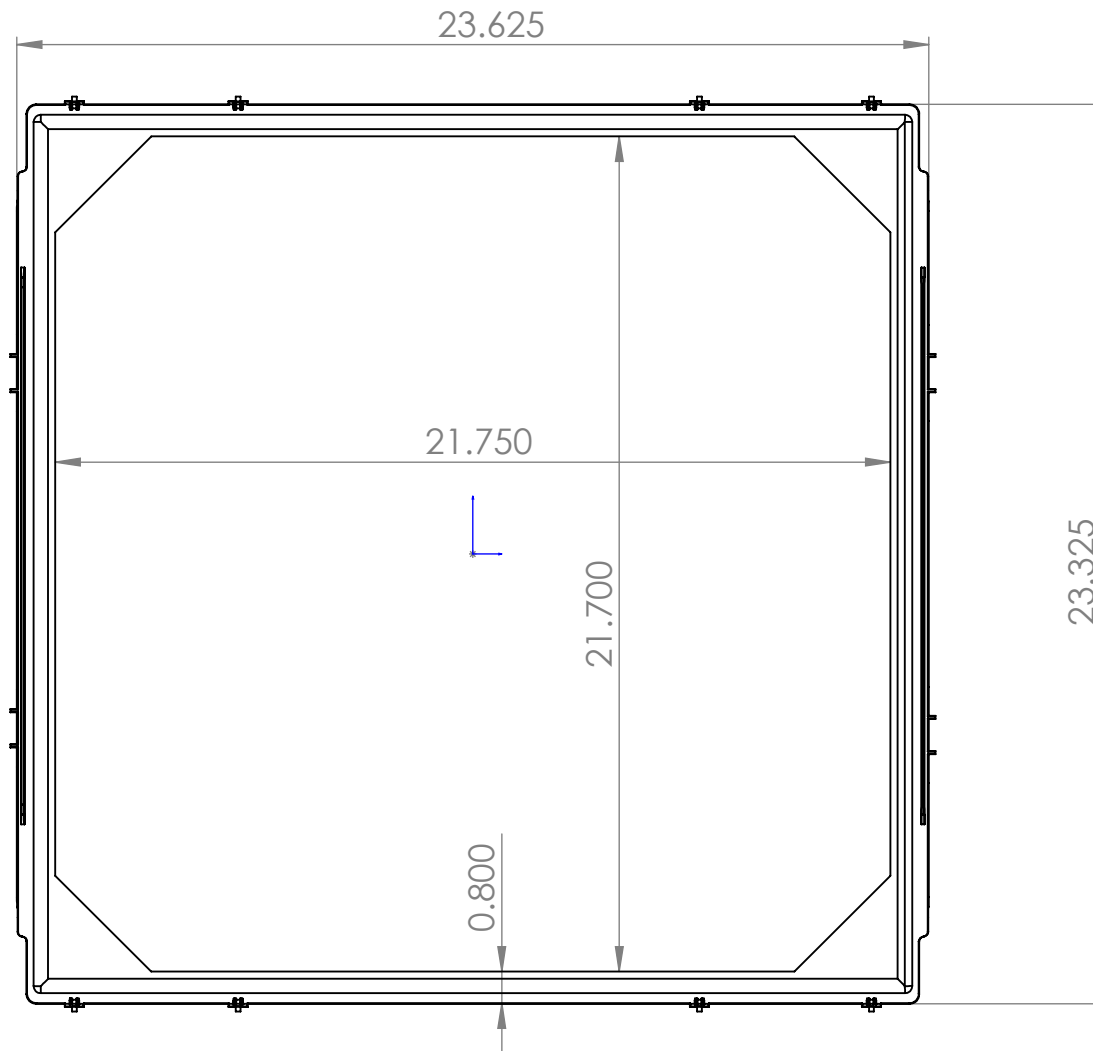
4C & 4D: Bellmouth flaking.



4C & 4D: Each bellmouth was cleaned and scraped by Filter-Doc per FP & L.

In summary, both 4D and 4C were in poor condition. At a later date, Filter-Doc recommends complete blasting and coating of each inlet. There is a lot of rusting and corrosion in each inlet from the hoods to the back side of the filter T-Grid. Filter-Doc also recommends replacing the ME panel in each of the inlet hoods. At the time of inspection, the T-Grid appeared to have a slight bow that needs to be repaired when new filters are installed.

Units 4C and 4D were consistent with each for the most part in regards to corrosion and overall condition.



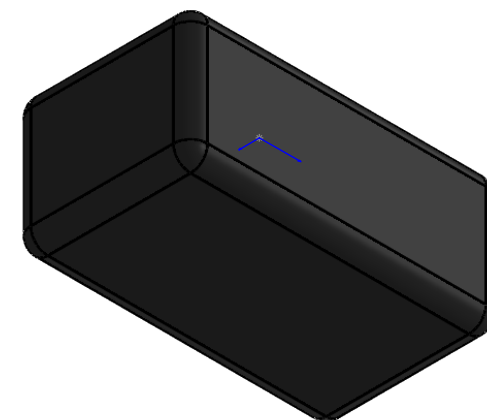
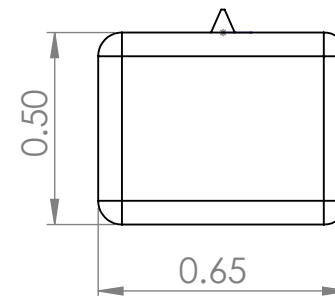
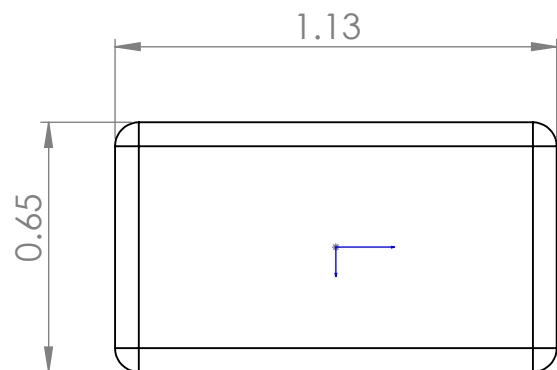
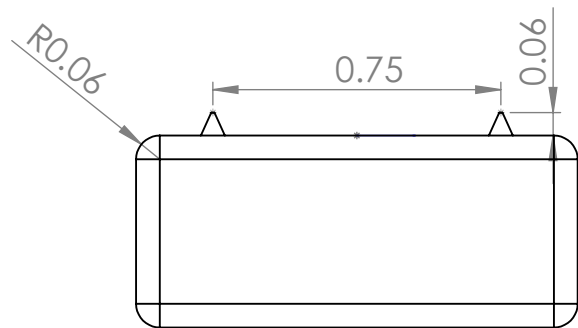
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Filter Frame-20170117new

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NEXT ASSY

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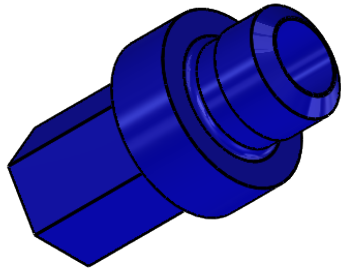
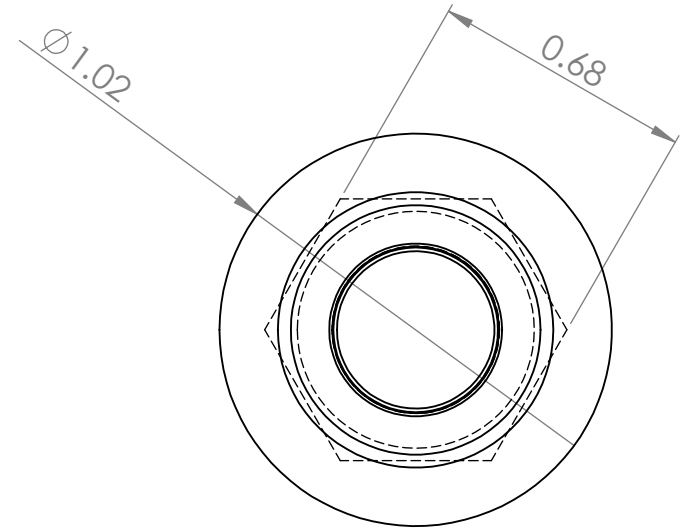
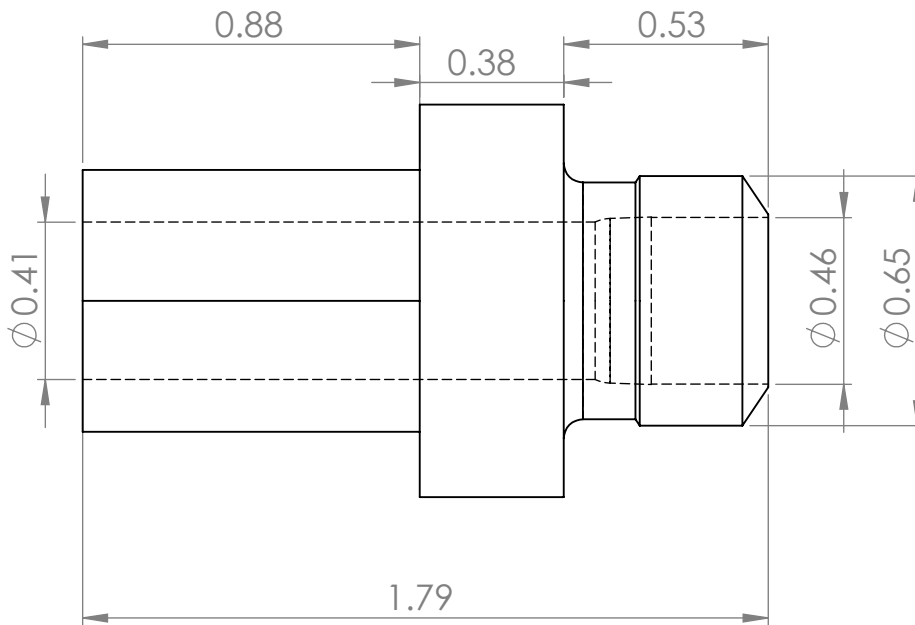
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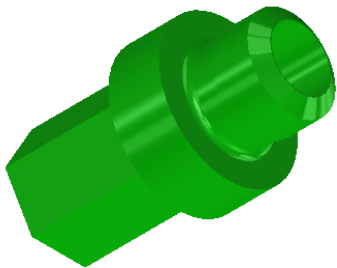
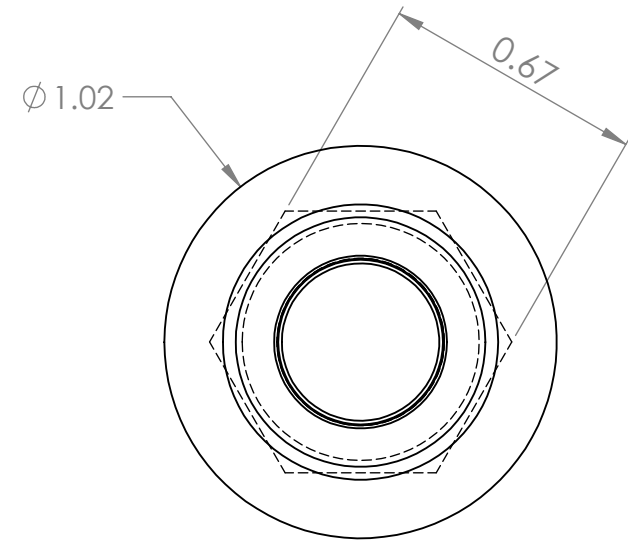
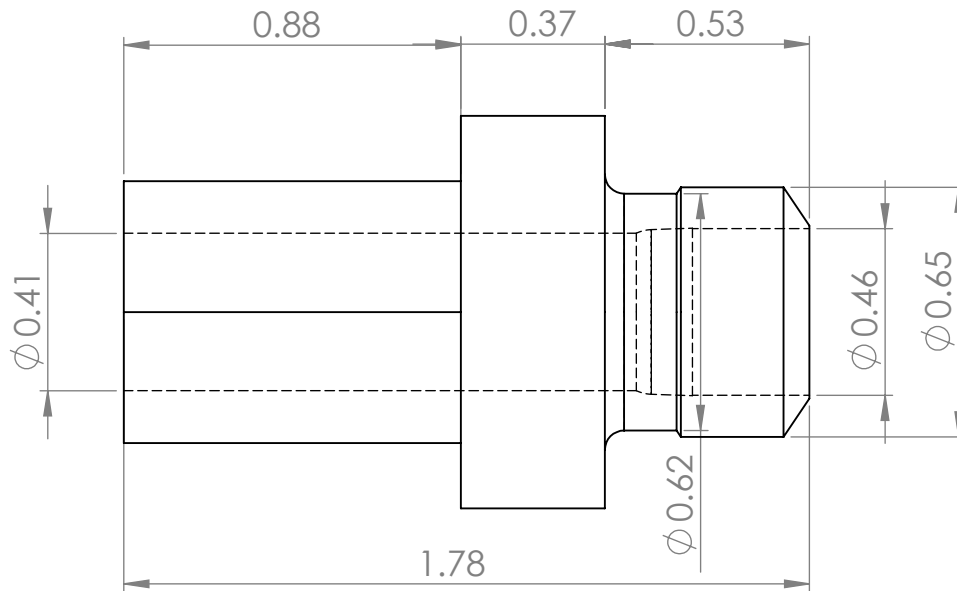
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