

# TEESING

SYSTEMS & ENGINEERING



DESIGN



ENGINEERING



PROTOTYPE



PRODUCTION  
/ ASSEMBLY



TESTING



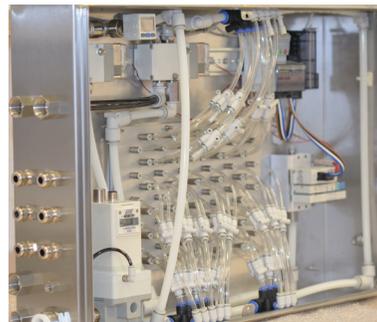
PLUG & PLAY

# TEESING INTRODUCTION

## ABOUT TEESING

TECHNICAL SUPPLIER SINCE 1952

Since 1952 Teesing is an international supplier of fittings, valves, tubing, systems and assemblies. With offices worldwide we are globally active in several specialized niche markets. We supply a complete package of products and services you require for your connection applications. Through our specialized knowledge of our products and markets we are capable in responding quickly to all your questions regarding the transport of gases and liquids to your point of use connection. Thanks to Teesing Systems & Engineering we are also capable of delivering customized products and assemblies that are developed to meet the specifications of your critical process demands.



## WHY TEESING?

- The International Supplier of high quality connectivity solutions
- Extensive knowledge in application advice
- Customer focused
- Flexibility
- Technical supplier for over 60 years
- Innovative engineering department
- In-house Cleanroom in the Netherlands
- Global Partnerships

# TEESING SYSTEMS & ENGINEERING

## INTRODUCTION

Teesing Systems & Engineering is part of the Teesing group. Teesing has its own engineering department which can develop parts and assemblies in consultation with its customers. Some customers require parts that are not available in the standard product range. In such cases, we as Teesing, design, develop and manufacture customised parts in small or large quantities on demand.



### ENGINEERING

Using the latest 3d engineering software, the Teesing Systems & Engineering team can modify an existing assembly or module or engineer a brand new solution.



### PRODUCTION

The worldwide network of suppliers and production facilities enables Teesing to have customised products manufactured in the right quantities at the right price.



### ASSEMBLY

Teesing can produce assemblies for easy installation in the customer's product. Teesing has the materials, machinery and know-how to create assemblies in any quantity.



### TESTING

Teesing has the facilities to test products following assembly. Besides technical inspections, products can be leak-tested using air or (demineralised) water. High precision manometers allow accurate testing even over longer periods of time.



### CLEANROOM SERVICES

The Teesing headquarters in the Netherlands features an in-house cleanroom where products can be cleaned, assembled, tested and double-packed according to customer requirements.

## “EFFICIENT ENGINEERING WITH MINIMAL COSTS.”

Over the years Teesing has noticed a growing demand in custom solutions. However custom products and assemblies usually come at a high price.



### Mark van Bronswijk, head of Teesing Systems & Engineering:

“As many engineering companies, we have the skills and knowledge to engineer virtually any product or assembly for connectivity solutions. However, what makes Teesing Systems & Engineering unique, is how combinations can be made between existing products as well as custom solutions to create the assembly in an efficient and cost effective manner.

We are not limited to a certain brand or product range. Apart from the large amount of products in stock, specifications and 3D files are ready for use. Our direct connections with the suppliers ensure fast production of custom components.”

# ENGINEERING PROCESS

## TEESING SYSTEMS & ENGINEERING

Teesing offers support on engineering at any stage of the development process. The Teesing Systems & Engineering team can tackle any problem and develop a product, produce in any quantity and test each product on demand. But also when products are nearly finished Teesing can offer support in the final stages of engineering and offer production or testing specific to customer requirements.



### “RELIABLE ENGINEERING SUPPORT AT ANY STAGE OF THE DEVELOPMENT PROCESS”

“Teesing Systems & Engineering can take projects from an idea from the customer to a finished product that is ready for use. But our engineers can also be a perfect additive to an existing engineering team concerning the development of specific parts in connectivity solutions. Having a large amount of products in stock, the Teesing Engineers can develop assemblies with available components simplifying the bridge between engineering and production.”

# CASE: VISCON HATCHERY AUTOMATION

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

Viscon is specialised in logistic solutions for all handling processes in Food and Agro businesses. One of them is the hatchery automation.

### PRODUCT INFORMATION

Two cabinets designed and manufactured by Teesing for air and fluid distribution. The pneumatics are used to move a tray with eggs into the machine and lift them towards the needle. Also a system is used to move the needle towards the egg.

The needles need to be cleaned on the outside after every egg and will be cleaned on the inside every day.

### PROCESS

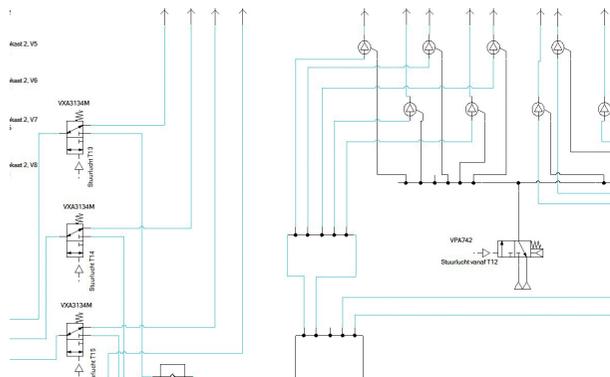
The project started with the question for tubing and ended up in a cooperation between Viscon, Teesing and manufacturer to optimise the system. The cabinets have been engineered by Teesing and produced in cooperation and a manufacturer to optimize the system. The cabinets are completely plug and play.



### PARAMETERS

Material:	Stainless Steel, PTFE, POM and Silicon
Medium:	Air, chloride, alcohol, soap and vaccine
Currently in use by:	Viscon
Pressure:	Air up to 10 bar, fluids atmospheric pressure
Temperature:	Ambient
Cabinet size:	81x63x40 cm
Components used:	Serto couplings, tubing, pneumatic valves, liquid pump, solenoid valves, air filters and reducers.

*"We can offer this solution because we are not bound by brands. We can combine the best solutions to one complete assembly which we have engineered, designed and produced."*



# CASE: TU DELFT VALVE

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

The TU-Delft valve is a special designed tool for George Krintiras, PhD. researcher at TU-Delft. As a PhD researcher he is working on the development of a novel process, called the 'Couette Cell' for the production of fibrous plant protein based meat replacers.

### PRODUCT INFORMATION

To create meat replacer samples a machine with heating chamber is build. The TU-Delft valve is an import tool to guide the material in the heating chamber.

When the chamber is full, the last material will be pushed in by turning the piston. When the piston cannot be screwed further in, the heating chamber will be closed.

### PROCESS

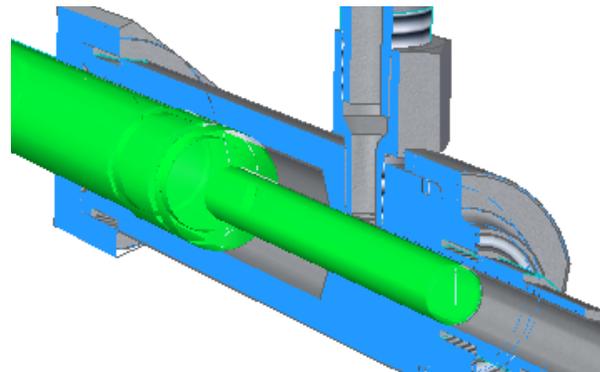
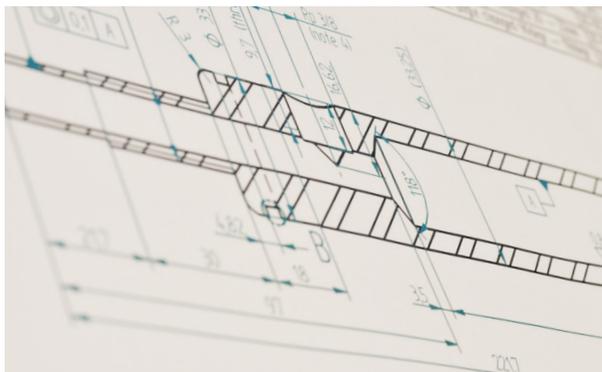
We were asked to create a valve that could guide and finally push an unknown dense material from a tube into a 200 degrees heating chamber. Combining different materials for use at high temperature, take into account the expansion of the material and avoid any gaps or making disassembly possible for cleaning. In the end the valve is easy to use, easy to clean and durable.



### PARAMETERS

Material:	Stainless Steel 316 and Kalrez
Medium:	Protein mixture
Currently in use by:	TU Delft
Working pressure:	8 bar
Working temperature:	up to 200 °C
Maximum temperature:	260 °C

*"We created a customer-specific solution to a problem which could not be solved with standard parts. Specially designed and produced parts combined with standard parts made it possible to keep the costs low."*



# CASE: JIC BULKHEAD FITTING

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

Thales Netherlands specializes in designing and producing professional electronics for defence and security applications, such as radar and communication systems.

### PRODUCT INFORMATION

A bulkhead is a fitting designed to be inserted into a panel cut-out from the rear (component side) or front side of the panel.

Currently there are only male JIC bulkheads on the market. This bulkhead has male UNF thread on one side and female UNF thread on the other side.

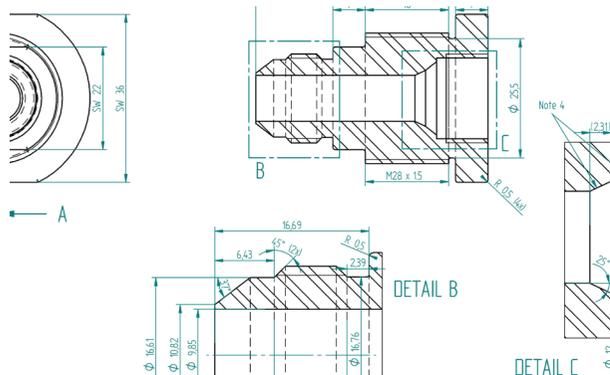
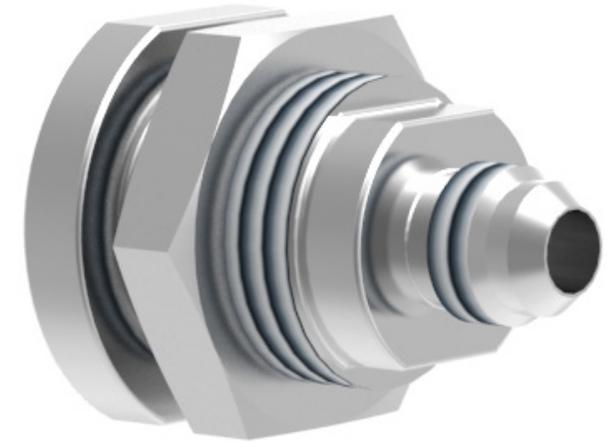
Both sides have a 37-degree flare seating surface according to military standards.

This connection type is often used in high pressure applications, around 200 bar.

### PROCESS

The customer was looking for a fitting that could transport a medium through a panel. Both connections needed to be JIC connections, male on one side, female on the other. Size of the connections were equal (both JIC-08) or different (JIC-06 and JIC-08).

We solved the problem by creating a bulkhead with on both sides a JIC connection.



# CASE: KMWE MODULAR CLEANROOM SOLUTIONS

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

KMWE is specialized in the machining of functional critical components and the assembly and engineering of fully tested mechatronic systems. KMWE came up with a solution to build a modular cleanroom which if necessary can be taken apart to move to a different location or to adjust the cleanroom when needed.

### PRODUCT INFORMATION

The chosen products are suitable for use with clean gasses and can be placed in the cleanroom. The Teesing Diaphragm valves are as leak tight as needed for the application ( $10^{-9}$  mbar\*l/s) with customised connections for the application and color marking for the different gasses. The needle valves for the ultra pure water have the right materials and seals.

### PROCESS

The project started with a request for advise for materials for the gas supply in their new ISO 6 cleanroom. By discussing with KMWE we decided to use stainless steel precision tube with Serto couplings which are suitable for cleanroom application. To keep the ultra clean gasses as clean as possible and to get to the leak tightness that is needed for the leaktests that need to be done on assemblies, the lines are shut off with diaphragm valves. These are customised to fit the application and desired connections.



### PARAMETERS

Productsgroups:	Stainless steel & PTFE tubing, diaphragm valves, couplings, fittings.
Currently in use by:	KMWE
Medium:	N <sub>2</sub> , XCDA, He, R14, demineralized water
Pressure:	Max. 10 bar.
Temperature:	Ambient
Classification:	ISO 6 clean room.

*"Combining the Serto panelmount with the tubing and valves suitable for cleanroom applications made it possible to only have the valves with connectors in the cleanroom and all the lines at the outside of the cleanroom."*



# CASE: CUSTOM HOSE FITTING

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

The world's leading provider of lithography systems for the semiconductor industry is located in the south of The Netherlands.

### PRODUCT INFORMATION

For the 17,6x13mm hose there is a push on coupling on the market. Teesing designed the same kind of coupling for the new 22x16mm hose.

The design is based on the current push on coupling used for the 17,6x13 hose.

For the samples and testing these couplings are fitted with a JIC 06 male connection (there are of course other connections possible).

To make sure the coupling clamps the hose correctly and can withstand a high enough pressure we performed a burst pressure test. This is done with water and that made clear that the coupling combined with the hose can withstand a pressure of over 40 bar. After that the hose strengthening breaks and the hose deforms.

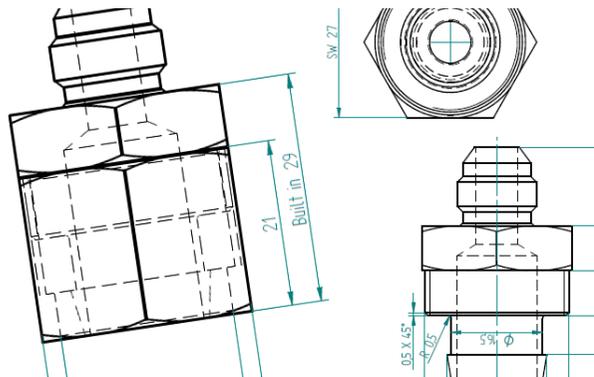
### PROCESS

A proper coupling is not always available for larger sizes and hose nipples in some occasions cause leakage. We came up with a secure connection especially for these hoses.



### PARAMETERS

Materials:	Stainless steel 316L in combination with PUR
Medium:	Demineralized water
Pressure:	Max 15 bar
Burst pressure test:	40 bar
Safety factor:	> 2.5
Temperature:	23 °C



# CASE: THALES LIQUID COOLING SYSTEM

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

Thales Netherlands specializes in designing and producing professional electronics for defence and security applications, such as radar and communication systems.

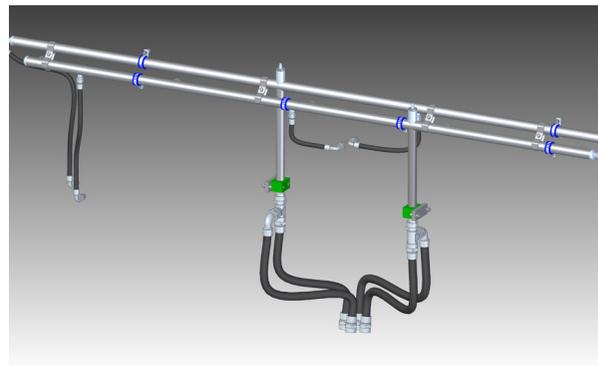
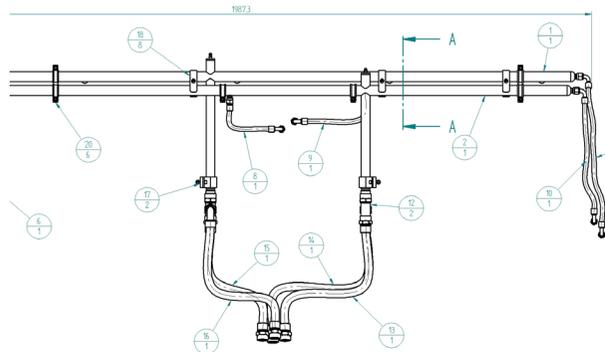
### PRODUCT INFORMATION

This is a plug-and-play liquid cooling system for the distribution of coolant to the heat exchangers. It is delivered to Thales as an assembled, pressure tested product, ready to fit into the radar seamlessly.

### PROCESS

Teesing received a claimed space for the LCS and several functions we should foresee in, like equal distribution, bleeding of trapped air and space critical areas in the radar system.

In a co-engineering trajectory we came to a plug-and-play solution. This results in a small scale production of quality products against competitive pricing.



### PARAMETERS

Material:	Stainless Steel, Aluminium and Braided hoses
Medium:	Glycol and/or demineralized water
Currently in use by:	Thales
Working pressure:	Max. 12 barg
Working temperature:	-10 ~ +60 °C
Components used:	Hoses, assembly
Burst pressure test:	16 barg
Safety factor:	> 3

"Purchasing Manager Thales: 'We are very satisfied with the path that we have travelled with Teesing.'"



# CASE: THALES HAND FILL PUMP

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

Thales Netherlands specializes in designing and producing professional electronics for defence and security applications, such as radar and communication systems.

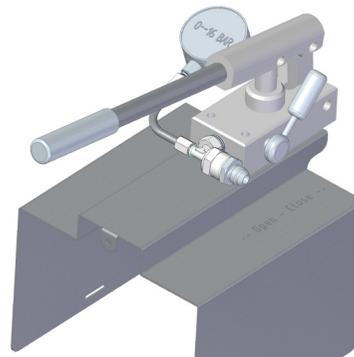
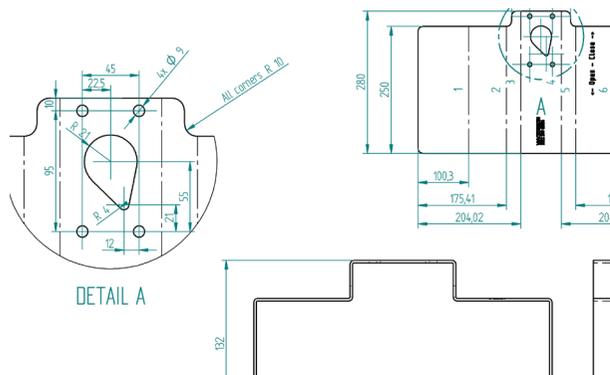
### PRODUCT INFORMATION

Teesing designed a Hand Fill Pump that can be combined with a jerry-can to avoid spillage of potential harmful fluids in the environment. This product can be ordered as one article number and comes in a case.

### PROCESS

The company was looking for a competent partner in connection technology to outsource future developments. We provide a ready-to-use solution: one case with a complete Hand Fill Pump. We choose a combination of off-the-shelf available products and combined those into a reliable system against a competitive price level.

Teesing anticipates the development of companies that want to focus again on their core business and turn to the specialists for advice on, for example, connection technology.



### PARAMETERS

Material:	Stainless Steel
Medium:	Glycol and/or demineralized water
Currently in use by:	Thales
Working pressure:	Max. 12 barg
Working temperature:	-10 ~ +40 °C
Components used:	Pumps, Serto, gauge, PE tubing, assembly
Burst pressure test:	16 barg
Safety factor:	> 3

*“Meanwhile, Thales is so satisfied with the services provided that Teesing is now involved early in the design process”*



# CASE: THALES LIQUID FILTER UNIT

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

Thales Netherlands specializes in designing and producing professional electronics for defence and security applications, such as radar and communication systems.

### PRODUCT INFORMATION

We designed a Liquid Filter Unit that filters coolant before it enters the heat exchangers in radar equipment. We used an industrial commercially available filter and built a frame work around it with required valves and connections to make it suitable for the demanding environment on navy vessels. The coolant liquid is filtered down to 1 µm contamination.

### PROCESS

Commercially available industrial components are not necessarily suitable for use in demanding marine applications, while the price and specification are interesting. By creating a frame around it, the filter can be used in this environment, protecting it from shocks and by even facilitating a redundancy function for some double filter versions.

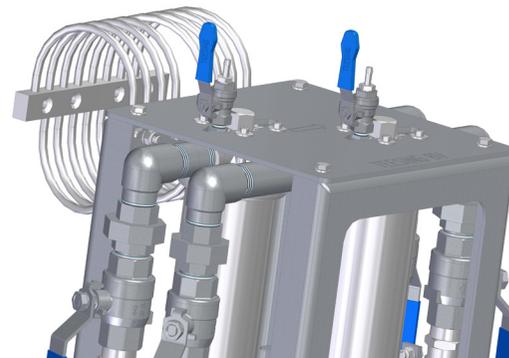
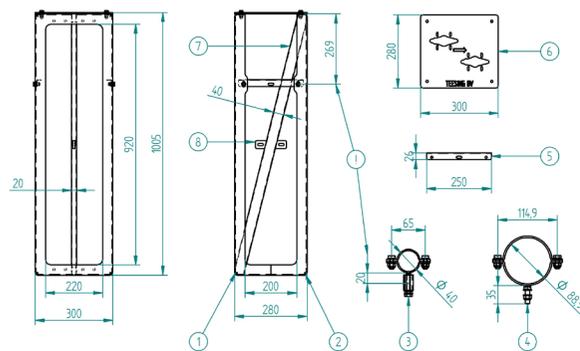
The end result is a plug-and-play product, assembled and pressure tested. By combining the industrial filter with a frame and connectors, a competitively priced product is created, suitable for the job.



### PARAMETERS

Material:	Stainless Steel
Medium:	Glycol and/or demineralized water
Currently in use by:	Thales
Working pressure:	Max. 6 barg
Working temperature:	-10 ~ +60 °C
Components used:	Adapters, fittings, filters, assembly
Pressure test:	Max. 10 barg
Safety factor:	1,5

*"Because the first design was well retrieved, we expanded the LFU family with another four versions, from single to double filters, with different capacities."*



# CASE: MUCUS LAYERS MEASUREMENT IN WATER INSTALLATIONS

## TEESING SYSTEMS & ENGINEERING

### INTRODUCTION

The KWR generates knowledge about water quality. It conducts research and translates scientific knowledge into applicable practical solutions. One result of this is an instrument that can measure the formation of a slime layer (biofilm) in water pipes. The instrument has proven its practical applicability in the concept phase and is now making the step to the market. Our engineering department understands what is needed for this and has taken on the further development of this test instrument.

### CHEMICALLY INERT AND PLUG-AND-PLAY: THE PRECONDITIONS

The CBM Continuous Biofilm monitor - as the device is called - is innovative. It can quickly detect problems such as blockages in pipes and deterioration in microbiological water quality. This improves the purification, storage and distribution of water. The intended customers for this system are water companies, which still take water samples from consumers' taps. The device to be designed had to be plug-and-play, chemically inert and samples had to be easy to collect.

That is why, when developing this product, we looked closely at:

- Applicability
- Design
- Cost of components
- Cost of assembly
- Deliverability

Our engineering department did this in continuous consultation with the scientists from KWR and Milispec (the company that markets this instrument).

### THE DESIGN WITH PVDF COUPLINGS

The CBM consists of glass sample ampoules with glass beads through which water flows continuously. Micro-organisms from the water adhere to the glass surface and grow, creating a layer of mucus (biofilm). The glass tubes must be easy to remove in order to be tested in the laboratory for the deposition of microorganisms (by weighing them). The precision of the measurement depends on the quality of the glass tubes, which are made by hand.

In this design we have used PTFE hose, PVDF couplings and VA flowmeters with integrated needle valve. As a system it is integrated in a compact aluminium and PVDF frame.

Our engineers designed the new instrument. The first prototypes were produced in our assembly department. A controlled environment is needed to measure the formation of biofilm. Preferably with the possibility to measure the deposition (semi) continuously. That is why design is important. The glass tubes must be easy to change and not introduce any contamination. In addition, a smart placement of connectors makes the device easy to apply in an existing situation.



### COOPERATION BETWEEN ALL PARTIES

KWR and Milispec have already shown the prototype instrument at the Waterbeurs and Horticontract fair and there is already a lot of interest from water companies and agriculture and horticulture.

We are not scientists in the field of water quality, but we do have very good engineers who know everything about the transport and treatment of liquids. The strength of a project like this lies in the cooperation between all parties involved. Our passion for technology goes hand in hand with the innovative nature of this type of engineering project.

