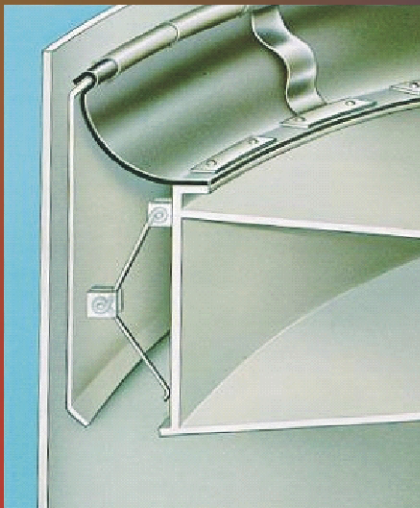
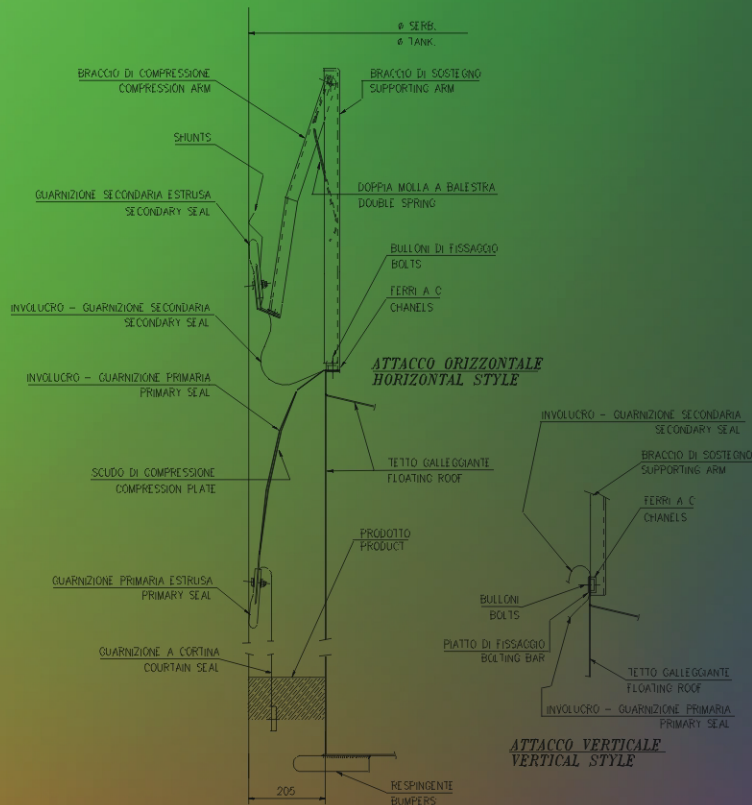
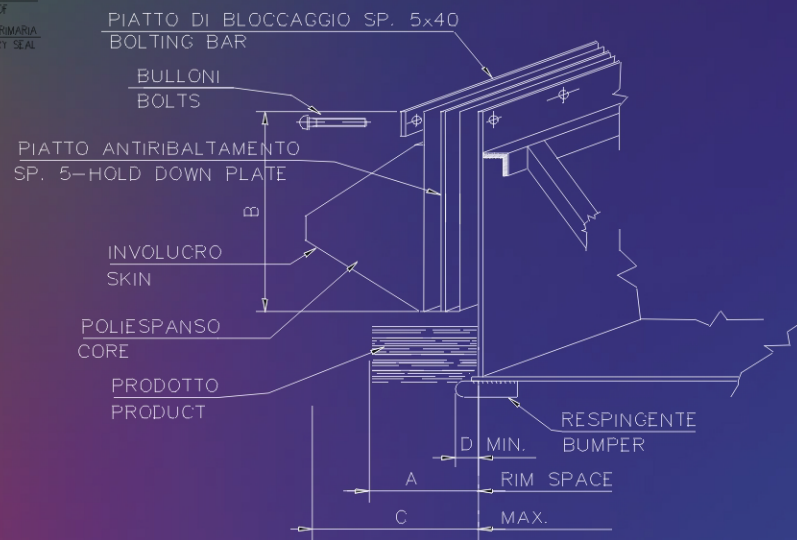


Sealing systems

FOR FLOATING ROOF TANKS



ATTACCO VERTICALE
VERTICAL STYLE



A=RIM SPACE	B	C	D
115	290	180	50
152	350	242	62
203	350	305	100

PMS
Produzione Misuratori Volumetrici

PETROL
Metering Systems

Via delle Valli, 25 - 04011 Aprilia (LT)
Tel/Phone: ++39.06.92727658 - Fax: ++39.06.92860025
e-mail: petrolms@petrolms.it - Web: www.petroilms.it

SEALING SYSTEMS FOR FLOATING ROOF TANKS

In accordance to our Customer needs, we offer:

- ❑ Primary and Secondary Sealing Systems With different design, in accordance to Standards API 2517 and 2519
 - ❑ Fire protection in accordance to NFPA 11 standards
 - ❑ Vapor containment (Environmental Protection) in accordance to API and EU Directive n.94/63 – Italian Law 413 dated 04 november 1997 and 21 January 2000
 - ❑ High quality construction Materials
 - ❑ High compatibility to products Stored
 - ❑ Supervising activity to erection and Star-Up Support
 - ❑ After-Sales Service
-

General Index

- **DOUBLE SEALING SYSTEMS FOR FLOATING ROOF TANKS**
- **PRIMARY SEALING SYSTEMS FOR FLOATING ROOF TANKS**
- **SEALING SYSTEMS PDM FOR FLOATING ROOF TANKS**
- **SECONDARY SEALS FOR FLOATING ROOF TANKS**

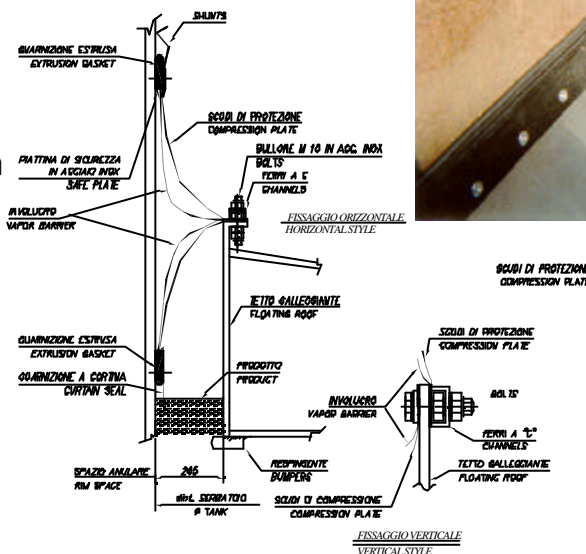
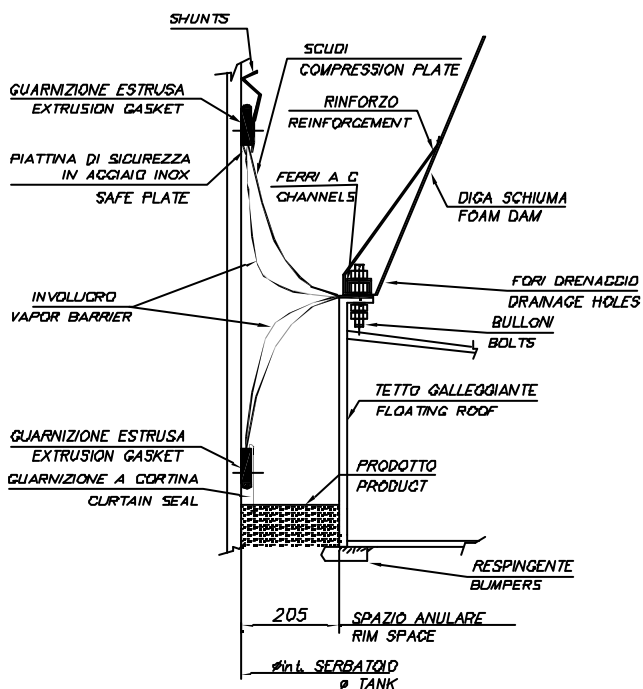
DOUBLE SEALING SYSTEMS FOR FLOATING ROOF TANKS

- ❑ DOUBLE SEALING SYSTEM D.C.S.2
- ❑ DOUBLE SEALING SYSTEM D.C.S.- D.F.S.3

DOUBLE SEALING SYSTEM D.C.S.2

Special Features:

- High Resistance
- Excellent flexibility to adapt to non vertical shells
- Constant centering action during the Loading and Unloading of Tank
- Installation from the top of Floating Roof
- Quick installation
- If overflow occurs, special stainless steel plate allow the system to recover the normal position

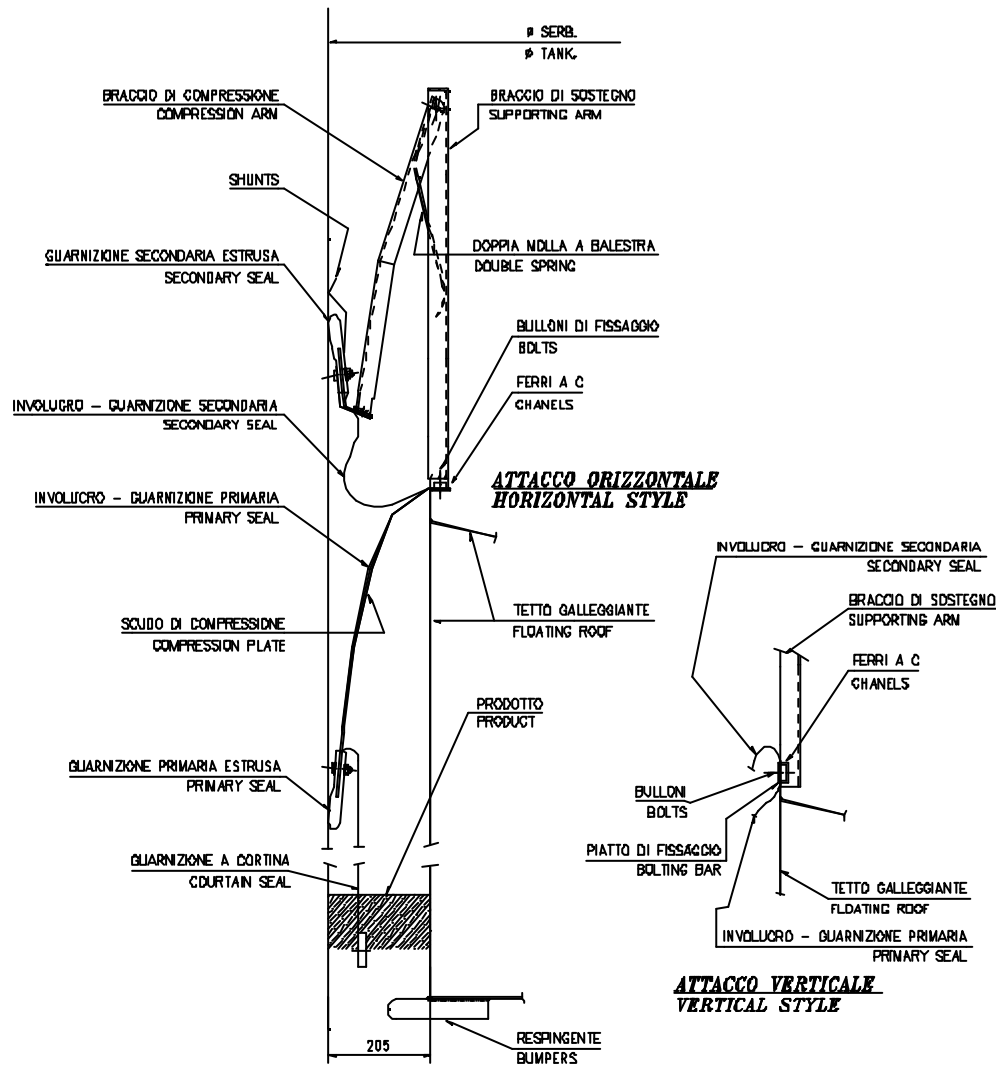


- Foam Dam
- The Double Sealing System can be completed with a galvanized steel foam dam to accomplish EPA requirements for fire protection.
- The foam dam installation doesn't requires any hot work

DOUBLE SEALING SYSTEM D.C.S.- D.F.S.3

Special Features:

- High Resistance.
- Excellent flexibility to adapt to the shells
- Constant centering action during the Loading and Unloading of the Tank
- Installation from the top of Floating Roof
- Quick installation
- Minimal loss of Tank Capacity



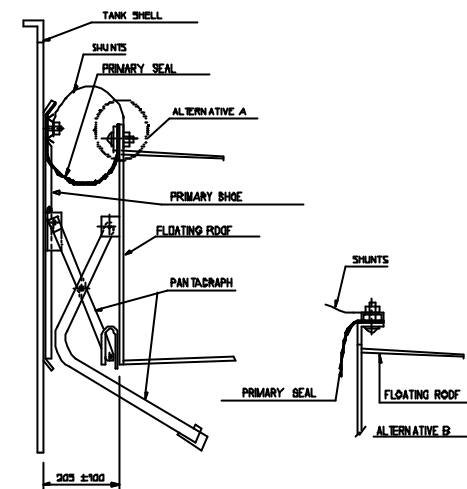
PRIMARY SEALING SYSTEMS FOR FLOATING ROOF TANKS

- ❑ PANTOGRAPH METTALLIC PRIMARY SEALING SYSTEM
- ❑ METALLIC PRIMARY SEAL WITH SCRAPER SHOES AND PANTOGRAPHS
- ❑ PRIMARY SEALING SYSTEM LIQUIDSEAL MK 1
- ❑ PRIMARY SEALING SYSTEM LIQUIDSEAL MK 2
- ❑ PRIMARY SEALING SYSTEM LIQUIDSEAL
- ❑ M.P.S.1 METALLIC PRIMARY SEAL
- ❑ M.P.S.2 PRIMARY SEAL
- ❑ FOAM-SEAL TYPE G PRIMARY SEAL

PANTOGRAPH METTALLIC PRIMARY SEALING SYSTEM

Special Features:

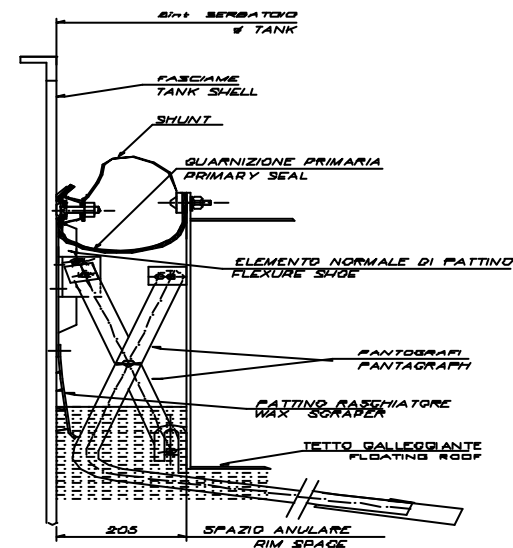
- ❑ The most utilized sealing system.
- ❑ High resistance
- ❑ Long working life
- ❑ Constant centering action during the loading and unloading of tank assured from pantograph elements.
- ❑ Good adherence to tank shell.
- ❑ Extra sized working area
- ❑ Good vapor containment
- ❑ Allowed Shoe Mounted Secondary Seals



METALLIC PRIMARY SEAL WITH SCRAPER SHOES AND PANTOGRAPHS

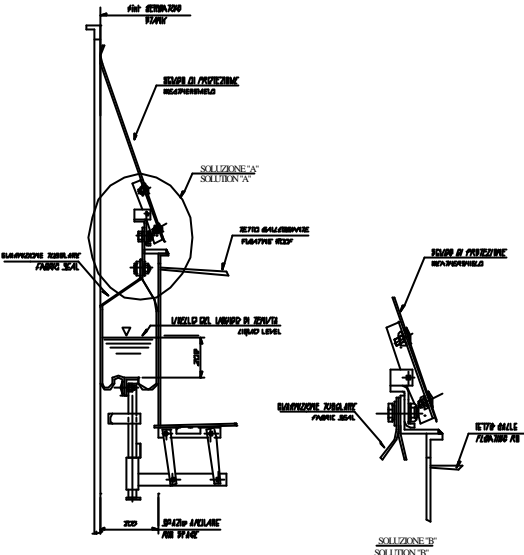
Main Features:

- ❑ Sealing system designed and modified for tanks containing dense products
- ❑ Shoe elements properly modified for joining of wax scrapers on lower edge
- ❑ Good adaptability to tank shell
- ❑ Easy installation and maintenance
- ❑ Good reduction of evaporative loss
- ❑ Excellent cost effective ratio



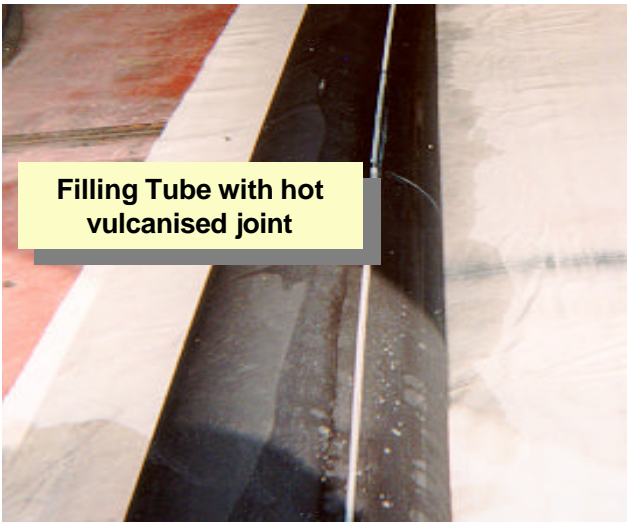
Special Features:

- Excellent adapting performance in non regular shells
- Good performance also with bolted tanks
- Constant centering action during the loading and unloading of tank
- The most efficient vapor containment in accordance with API 2517/2519
- Absence of vapor chamber between product and seal



Special Features:

- ❑ Evolution of MK1 System
- ❑ Primary seal in Nitrile Elastomers with nylon insert
- ❑ Antistatic, self extinguish, high abrasion resistance, 100% aromatics resistance
- ❑ Supply closed-ring, hot vulcanized.
- ❑ Internal filling tube realized with the same characteristic of external envelop
- ❑ Easy repair on field



PRIMARY SEALING SYSTEM LIQUIDSEAL

TANKS WITH LIQUIDSEAL

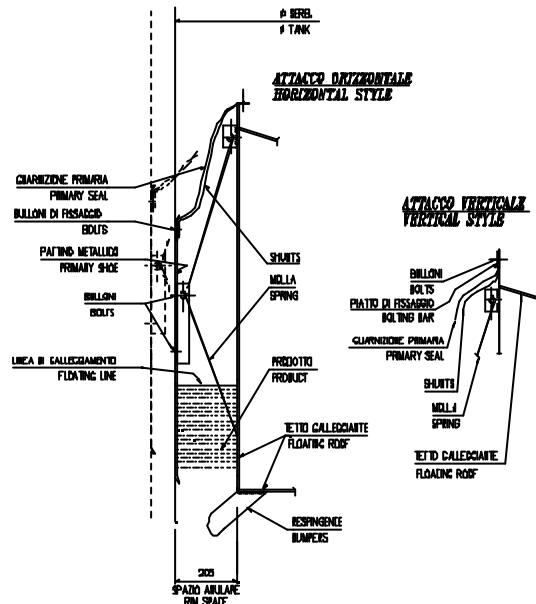


TANKS WITH OTHER SEALING SYSTEM



On 1964 a violent heartquake struck Niigata city in Japan. Tanks provided with primary liquidseal and containing gasoline, maintained the contents and the relevant floating roofs kept on working, notwithstanding deformed as consequence of heartquake shocks.

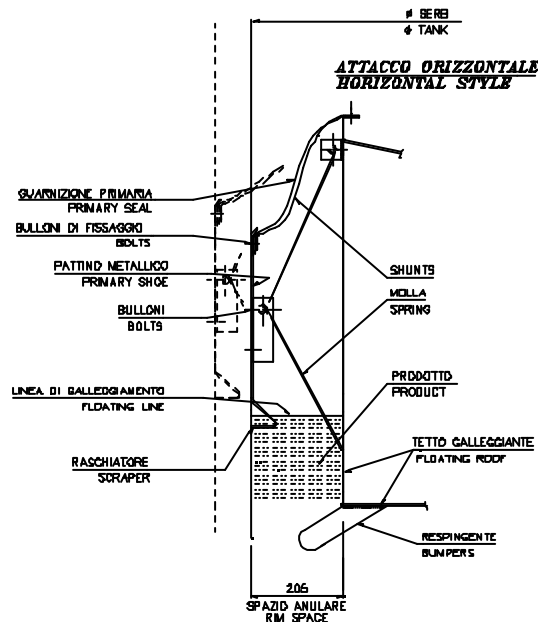
M.P.S.1 METALLIC PRIMARY SEAL



Special Features:

- High resistance
- Constant centering action during loading and unloading of the tank assured by special springs
- Good adherence to tank shell
- Metallic particulars can be either stainless steel AISI 304 or galvanized.
- Below the primary seal reduced vapour chamber
- Erection from the top of floating roof in working tanks
- Quick installation
- Shunt stainless steel AISI 304
- Range 205 mm tolerance ± 100 mm
- The sealing system it's Patented.

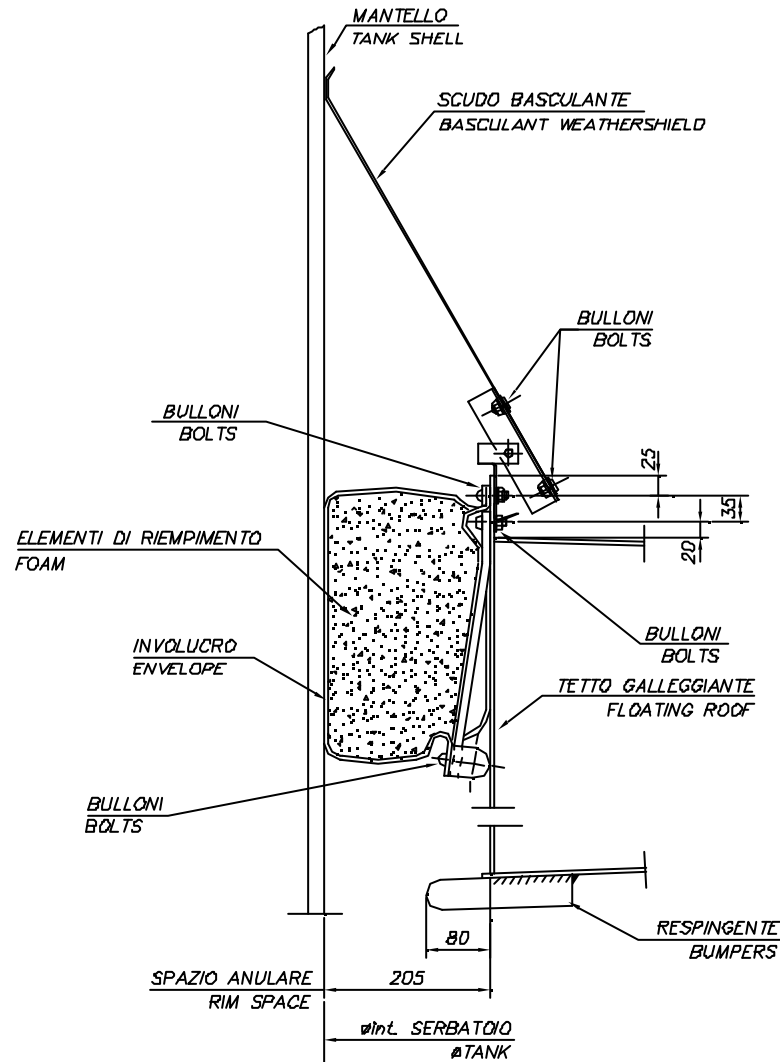
M.P.S.2 PRIMARY SEAL



Special Features:

- Primary seal designed for tanks containing dense products
- Shoes and integrated wax scrapers
- Excellent adaption to tank shells
- Easy erection and maintenance
- Excellent vapour containment
- Excellent cost effective ratio
- The Sealing System it's Patented.

FOAM-SEAL TYPE G PRIMARY SEAL



Special Features:

- External envelope, polyester insert polyurethane coating, has the purpose to contain the pushing element; it is designed for a very good resistance to abrasion, to atmospheric agents and to hydrocarbon aromatic vapours
- Good adaptability to tank shell
- Possibility of erection from top of the tank
- Quick installation
- Range 205 mm tolerance ± 100 mm
- Constant centering push of floating roof during loading and unloading, assured by soft and resilient expanded polyurethane cushions
- Constant centering action of tank during loading and unloading of the tank
- Low cost

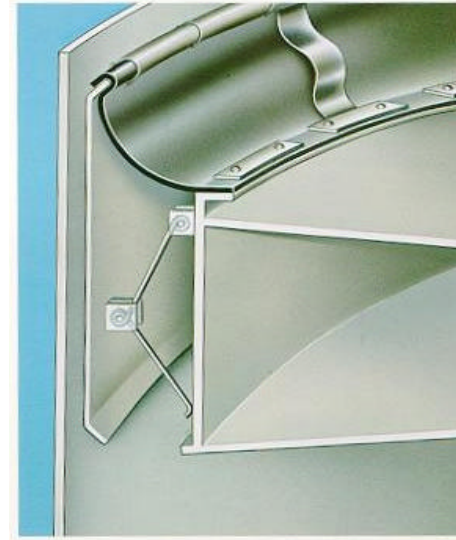
SEALING SYSTEMS PDM FOR FLOATING ROOF TANKS

- ❑ PRIMARY SEAL PDM SPRINGTITE
- ❑ PRIMARY SEAL PDM TUBESAL
- ❑ PRIMARY SEAL PDM DELTASEAL

PRIMARY SEAL PDM SPRINGTITE

Special Features:

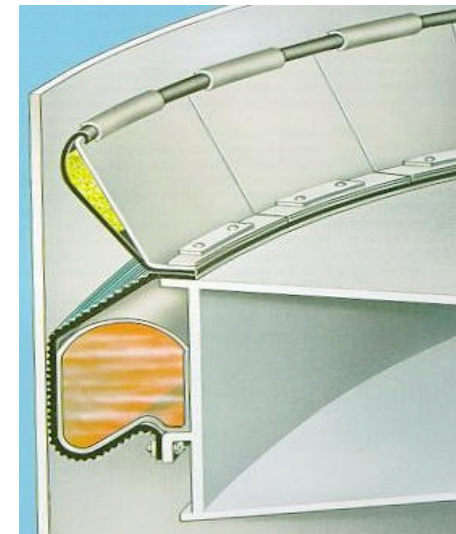
- ❑ Easy installation
- ❑ High resistance
- ❑ Long working life
- ❑ Progressive centering action assured by differentiate compression springs
- ❑ Excellent adaptability to tank shell
- ❑ Large working area
- ❑ Good reduction of losses



PRIMARY SEAL PDM TUBE-SEAL

Special Features:

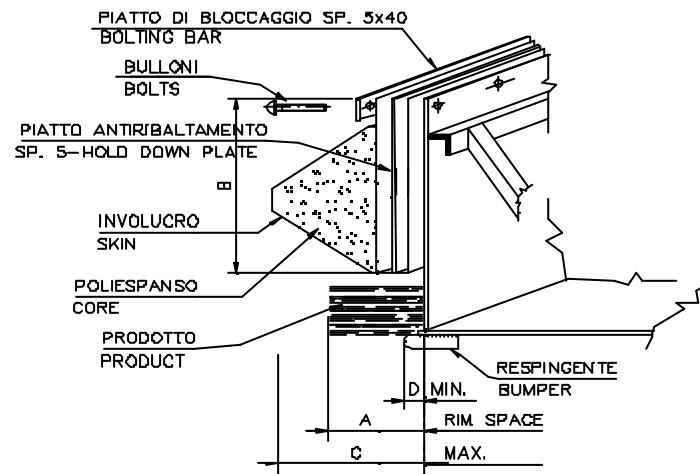
- ❑ Excellent adaptability even in warped tanks
- ❑ Efficient seal tight in old tanks
- ❑ Constant centering action during the loading and unloading of the tank
- ❑ Constant seal tight (rubber/metal) more efficient than metallic seal (metal/metal)
- ❑ Absence of vapour chamber between seal and product
- ❑ The best primary seal in matter of vapour containment (API 2517/2519)



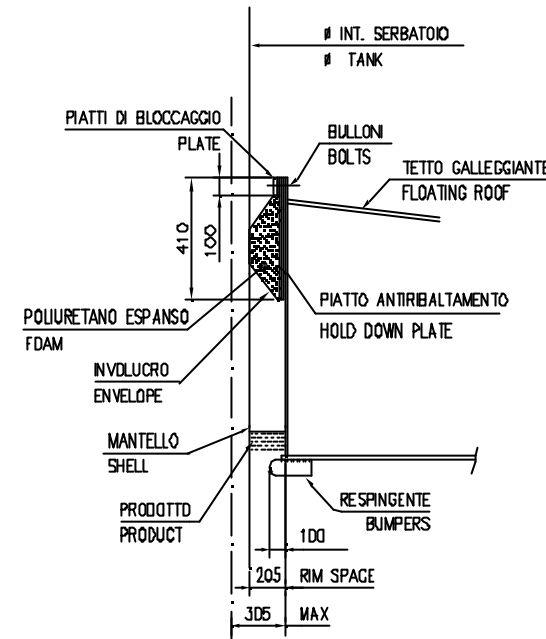
PRIMARY SEAL PDM DELTASEAL

Special Features:

- Easy installation
- High resistance
- Adaptability to all type of floating roofs
- Centering action of floating roof assured by differentiate compression expanded polyurethane filling elements
- Excellent adaptability to the tank shell
- Large working area
- Good reduction of vapor losses
- Suitable for warped tanks maintenance
- Range: 205 mm \pm 100 mm. 152 mm \pm 90 mm.



A-RIM SPACE	B	C	D
115	290	180	50
152	350	242	62
203	350	305	100



- Range :

205 mm \pm 100 mm

152 mm \pm 90 mm

115 mm \pm 65 mm

DELTASEAL for INTERNAL
FLOATING ROOFS

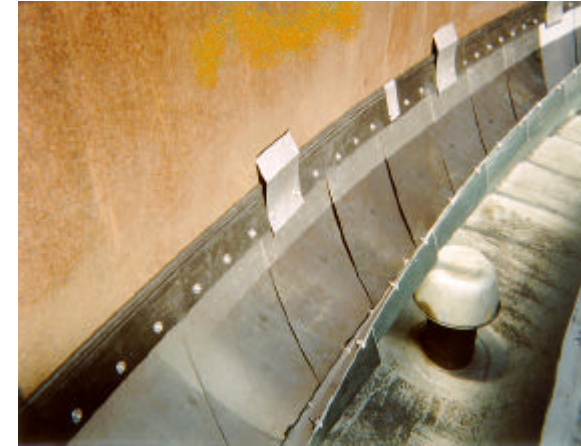
SECONDARY SEALS FOR FLOATING ROOF TANKS

- ❑ D.C.S. "D" SECONDARY SEAL
- ❑ D.C.S. "D" SECONDARY SEAL with FOAM DAM
- ❑ D.C.S. SECONDARY SEAL
- ❑ D.F.S.3 (Patented) SECONDARY SEAL
- ❑ D.F.S.3 (Patented) SECONDARY SEAL
WITH PRE-FABRICATED FOAM DAM
- ❑ G.S.P.H. SECONDARY SEAL

D.C.S. "D" SECONDARY SEAL

Special Features:

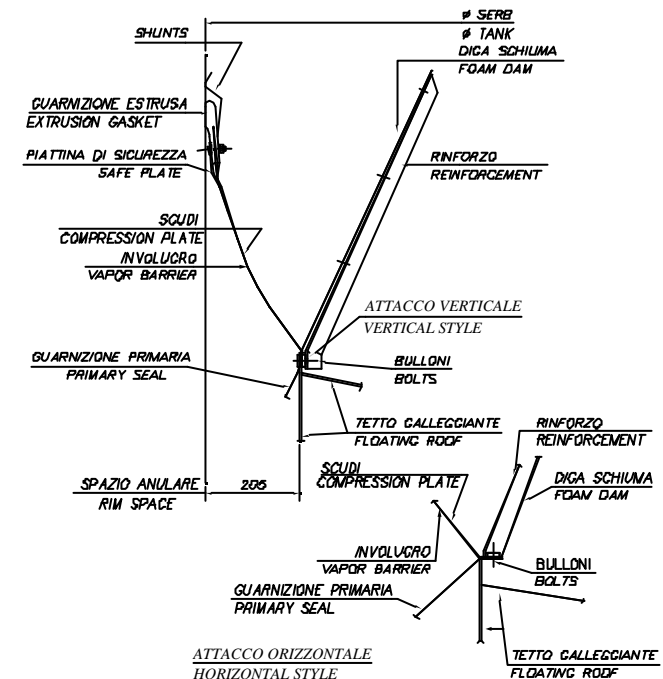
- High Resistance
- Excellent flexibility to suit to non-vertical shells
- Constant centering action during the Loading and Unloading of Tank
- Installation from the top of Floating Roof
- Quick installation
- Independent installation from primary seal
- Suitable on all type of primary seals installed into the tank.



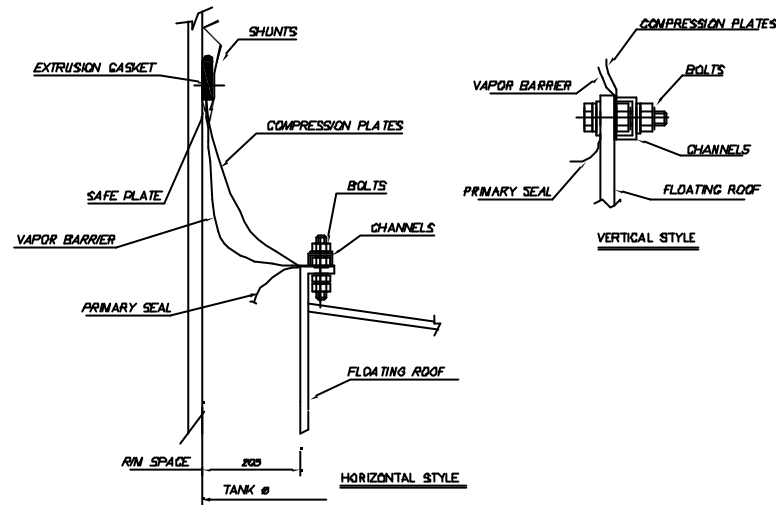
D.C.S. "D" SECONDARY SEAL with FOAM DAM

Special Features:

- Foam Dam
- As alternative to elevation of existing Foam Dam, combined with D.C.S. Secondary Seal a pre-fabricated Foam Dam is available, constituted by galvanised elements
- No hot works required



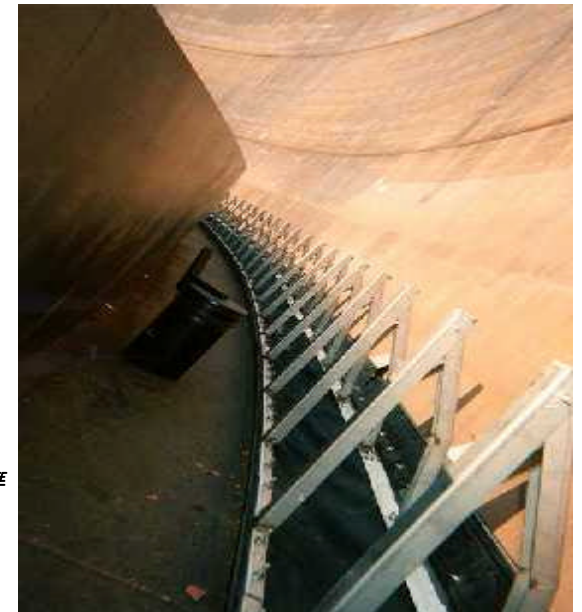
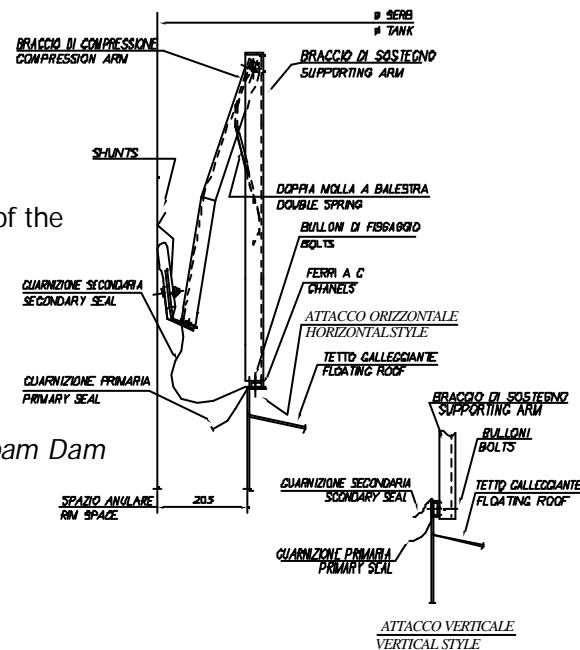
D.C.S. SECONDARY SEAL



D.F.S.3 (Patented) SECONDARY SEAL

Special Features:

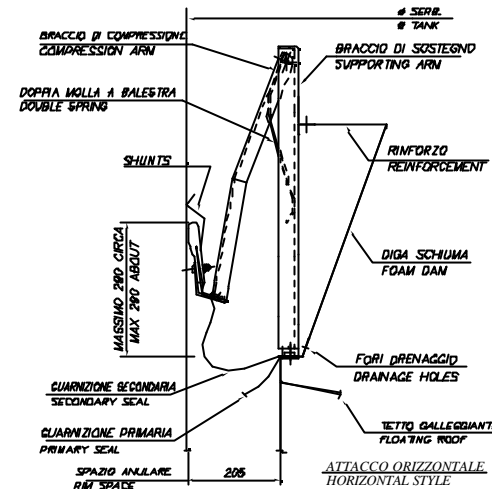
- High Resistance
- Excellent flexibility to suit to shell deformation
- Constant centering action during loading and unloading of the tank
- All stainless steel metallic parts
- Range 205 mm tolerance \pm 100 m
- Possibility of erection from the top of Floating Roof
- Quick installation
- Minimum elevation from fixing top (*no modification of Foam Dam required*)
- Easy maintenance even with working tanks



D.F.S.3 (Patented) SECONDARY SEAL WITH PRE-FABRICATED FOAM DAM

Special Features:

- ❑ Foam Dam
- ❑ To minimize filling lasting of Foam Dam, joining to secondary Seal DFS3, it is available a pre-fabricated Faom Dam, constituted by stainless steel or galvanised elements.
- ❑ Installation without hot works



G.S.P.H. SECONDARY SEAL

Special Features:

- ❑ Installation from the top of Floating Roof in working tanks
- ❑ Quick installation
- ❑ Minimum elevation from fixing point
- ❑ Range 205 mm tolerance ± 100 mm
- ❑ Designed for installation of Pantograph Metallic Primaty Seals or PDM Springtite
- ❑ Very good efficient Secondary Seal
- ❑ Excellent cost effective ratio

