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## FDV-dokument PVC-U Trykkør/-Fittings

**Produkt:** PVC-U Trykkør/-fittings

**Produsent:** Georg Fischer Ltd Schaffhausen CH  
**Anvendelse:** Rør/-fittings til bruk i trykkørsystemer.

**Tekniske data:** Dimensjoner: 6 – 400mm / 3/8 – 8 BS  
Materiale: PVC-U (Unplasticised Polyvinyl Chloride)  
Farge: RAL 7011 – Mørk grå  
Densitet: Ca 1,38 g/cm<sup>3</sup> (EN ISO 1183-1)

**Sertifisering** Sertifisert i h.t. blant annet, ISO 727, DIN 8063, DIN EN ISO 15493

### HMS (helse, miljø og sikkerhet):

**Brannfare** PVC kan brenne, men er selvslukkende. Ved brann og evt. forbrenning dannes organiske forbrenningsprodukter og sure gasser - blant annet saltsyre.

**Helsefare** Ingen helsefare ved normal bruk. Kun fare ved brann. Generelt er den største faren ved branngasser innholdet av CO. Denne gassen er luktfri og har både akutte og toksiske effekter. Symptomer er svimmelhet, tretthet, hodepine, kvalme og uregelmessig pust.  
Personer utsatt for branngasser fra PVC, bør observeres av hensyn til mulige ettervirkninger forårsaket av sure gasser (HCl).

**Førstehjelp** Ved symptomer som beskrevet over: Sørg for frisk luft og tilkall lege

**Destruksjon** Avfall kan deponeres på godkjent deponi. Større mengder avfall bør ikke destrueres i forbrenningsanlegg med mindre det er utstyrt med renseanlegg for sure røkgasser.

**Service- og vedlikeholdsinstruks**

- Lagring** Rørene skal lagres på et godt avrettet underlag. Rør skal beskyttes mot UV-stråling der dette er mulig.  
Anbefalt maksimal lagringstid utendørs er 1 år, men plastmaterialet forringes ikke nevneverdig ved lengre tids utelagring i nordisk klima.
- Montering** Rørene monteres mot rørmuffen, ventil eller mot annen rørdel som er beregnet til dette. Montering i h.t Georg Fischer montasjeinstruks. (side 3 og 4)
- Temp/Trykk** PVC-U Rør tåler kontinuerlig temperatur opp til 60 °C. Røret tåler stadig mindre mekaniske belastninger/-trykk jo høyere temperaturen blir.  
Kontakt Georg Fischer AS for trykk, og tempdiagram.
- Service Vedlikehold** Produktet krever ingen service.  
Produktet i seg selv krever ikke vedlikehold. Derimot kan rørsystemet kreve vedlikehold avhengig av driftsbetingelsene.
- Reservedeler** Skadet rør erstattes fortrinnsvis med samme type produkt. Reservedeler skaffes gjennom entreprenør, rørlegger, rørgrossist e.l. - eller ved å kontakte produsenten direkte.

**+GF+****Steg for steg  
Klargjør røret****1. Kutt røret rett**

⇒ for å få riktig flate mellom rørende og tilhørende muffe



**2. Fase rørende og avgrad den rette enden, slik at**  
⇒ røret kan bli trykt sammen med rørdel til senter

⇒ Hele limeområde kan bli brukt

**+GF+****Steg for steg  
Rens og merk rør og rørdel****3 Rens delene med Tangit rensesvæske for å**

⇒ Fjerne alle urenheter

⇒ Løse opp område som skal limes

**4. Mål lengden som skal limes og merk på røret**

**+GF+**

## Steg for steg Sjekk og smør på Tangit lim



5. Kontroller Tangit lim og rør skikkelig

- ⇒ Gjenopprette den originale strukturen og viskositeten
- ⇒ Bruk kun Tangit lim som ikke har mistet den original konsistensen
- ⇒ Ikke spe ut Tangit lim



6. Smør på Tangit lim på begge sider, på hele lime overflaten

- ⇒ rørdel: tynt lag
- ⇒ rørende: tykkere lag
- ⇒ unngå å bruke for mye Tangit lim

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**+GF+**

## Steg for steg Sammenføy rørdelene



7. Sammenføy delene til merkingen

⇒ Ikke vri

⇒ "Åpen tid" er avhengig av tykkelsen på den påsmurte limen og omgivelsestemperaturen:

- ⇒ "åpen tid" for PVC-U: 4 min. ved 20°C
- ⇒ hold på delene noen sekunder, slik at limen fester seg
- ⇒ Kontroller at rørene er trykt sammen til det stopper
- ⇒ fjern all overskytende lim

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# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. K-3835

This Certificate consists of 3 pages

*This is to certify that the*  
**Plastic Pipes, Thermoplastic**


*with type designation(s)*  
**PVC-U PN16 Fittings and Valves**

*Manufactured by*  
**Georg Fischer Piping Systems Ltd.**  
Schaffhausen, Switzerland

*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships  
Det Norske Veritas' Type Approval Program for Thermoplastic Piping, preliminary

*Application*  
Non-essential systems for water up to 16 bar. Service temp. 0°C to 60°C. For inst. acc. to DNV Rules and Manufacturer's Spec. The piping system is not tested w.r.t. Fire Endurance. Tested to Low Flame Spread acc. ASTM D635.

*Place and date*  
Høvik, 2009-09-21  
for DET NORSKE VERITAS AS

  
Helge Drange  
*Head of Section*



*Local Office*  
DNV Essen

*This Certificate is valid until*  
2013-12-31

  
Gisle Hersvik  
*Surveyor*

**Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million in this provision 'Det Norske Veritas' shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: K-3835  
File No.: 332.31

## Product description

PVC-U PN16 Fittings and Valves.

Dimensions: DN16 to DN315 (as per +GF+ PVC-U Product Catalogue)

### Fittings:

Caps, Tees, Elbows 45°, 90°, Sockets, Flange Adaptors and FR Flanges

### Valves:

2-Way Ball Valve, Type 546

### Joining technique:

Solvent jointed

## Application/Limitation

For installation according to DNV Rules and Manufacturer's Specification.

The approval covers application such as non-essential system, hot and cold water systems chilled and brine water systems, cooling systems (air condition), black and grey water systems, watertreatment fresh and waste water, osmosis systems and evaporation, fresh water bunker lines, etc.

Maximum service pressure 16 bar. Service temperature range 0°C to 60°C.

The piping system is tested with respect to Low Flame Spread performance in accordance with ASTM D635 (accepted as an alternative to the test procedure in IMO Resolution A.653(16)).

The piping system is not tested with respect to Fire Endurance characteristics.

## Type Approval documentation

1. Previous Type Approval Certificate No. K-2627.
2. Letter from DNV Essen of 2009-07-24, incl. MEMO from DNV Essen of 2009-07-16, +GF+ test reports and DNV Survey Report of 2009-07-16.
3. Georg Fischer +GF+ PVC-U Product Catalogue and Georg Fischer +GF+ Plastics Technical Manual.



Cert. No.: K-3835  
File No.: 332.31

### Tests carried out

- Type Testing carried out as per **Type Approval documentation**, and in addition a:
- Rate of burning test acc. to ASTM D635 has been carried out, ref. SKZ Report no. 47667/02 dated Würzburg, 2002-01-14.

### Marking of product

The product is to be marked with the *manufacturer's name*: **Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland** and *type designation*.

### Certificate Retention/Renewal Survey

*Surveys to be carried out at:*

**Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland** (Fittings)  
**Georg Fischer Kunststoffarmaturen AG, Landquart, Switzerland** (Valves)

The scope of the Retention/Renewal Survey is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Survey to be performed after two (2) years (Certificate Retention Survey) and at renewal after four (4) years (Certificate Renewal Survey).

The main elements of the survey are:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

**CERTIFICATE NO. K-3841**

This Certificate consists of 3 pages

*This is to certify that the*  
**Plastic Pipes, Thermoplastic**

*with type designation(s)*  
**PVC-U PN10 Pipes and PVC-U PN16 Pipes**

*Manufactured by*  
**Georg Fischer DEKA GmbH**  
DAUTPHETAL, Germany

*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships  
Det Norske Veritas' Type Approval Program for Thermoplastic Piping, preliminary

*Application*  
Non-essential systems for water up to 10 and 16 bar. Service temp. 0°C to 60°C. For inst.  
acc. to DNV Rules and Manufacturer's Spec. The piping system is not tested w.r.t. Fire  
Endurance. Tested to Low Flame Spread acc. ASTM D635.


*Place and date*  
Høvik, 2009-09-21  
for DET NORSKE VERITAS AS

  
Helge Drange  
Head of Section



Local Office  
DNV Essen

*This Certificate is valid until*  
2013-12-31

  
Gisle Hersvik  
Surveyor

**Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate Invalid.  
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.





Cert. No.: K-3841  
File No.: 332.31

## Product description

PVC-U PN10 Pipes and PVC-U PN16 Pipes.

Dimensions: DN16 to DN160 (as per +GF+ PVC-U Product Catalogue)

### Pipes:

	Outside diameters and minimum wall thickness						
OD [mm]	16	20	25	32	40	50	63
t [mm]	1,2	1,5	1,9	2,4	3,0	3,7	4,7

	Outside diameters and minimum wall thickness						
OD [mm]	75	90	110	125	140	160	
t [mm]	5,6	6,7	8,2	9,3	10,4	11,9	

### Joining technique:

Solvent jointed

## Application/Limitation

For installation according to DNV Rules and Manufacturer's Specification.

The approval covers application such as non-essential system, hot and cold water systems chilled and brine water systems, cooling systems (air condition), black and grey water systems, watertreatment fresh and waste water, osmosis systems and evaporation, fresh water bunker lines, etc.

Maximum service pressure 10 and 16 bar. Service temperature range 0°C to 60°C.

The piping system is tested with respect to Low Flame Spread performance in accordance with ASTM D635 (accepted as an alternative to the test procedure in IMO Resolution A.653(16)).

The piping system is not tested with respect to Fire Endurance characteristics.

## Type Approval documentation

1. Previous Type Approval Certificate No. K-2633.
2. Letter from DNV Essen of 2009-07-24, incl. MEMO from DNV Essen of 2009-07-16, +GF+ test reports and DNV Survey Report from +GF+, Schaffhausen, Switzerland of 2009-07-16.
3. Georg Fischer +GF+ PVC-U Product Catalogue and Georg Fischer +GF+ Plastics Technical Manual.



Cert. No.: K-3841  
File No.: 332.31

### Tests carried out

Type Testing as per **Type Approval documentation**, and in addition a:

- Rate of burning test acc. to ASTM D635 has been carried out, ref. SKZ Report no. 47667/02 dated Würzburg, 2002-01-14.

### Marking of product

The product is to be marked with the *manufacturer's name/logo*: **+GF+ / DEKA**, *material/type designation, nominal pressure, dimensions and production date*.

### Certificate Retention/Renewal Survey

The scope of the Retention/Renewal Survey is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Survey to be performed after two (2) years (Certificate Retention Survey) and at renewal after four (4) years (Certificate Renewal Survey).

The main elements of the survey are:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE