

# Jointing technology

## Solvent cement jointing

### Instructions for Tangit solvent cement jointing of PVC-U dimension d6 to d400

#### General

Solvent cement jointing calls for adequate technical know-how, which can be acquired in the appropriate training courses. Your GF representative will gladly provide you with information about training possibilities.

#### NOTICE

##### Chemical resistance

Selecting applicable solvent cement

- Please consider the appropriate recommendations in the chapter "Chemical Resistance" to the use of Tangit and/or Dytex.

#### Dimensions and tolerances

The dimensions of GF pipes, fittings and valves conform generally to the various national standards as well as to ISO 727-1 concerning dimensions of sockets. Our fittings and valves can be used with any PVC-U pipes whose outside diameter tolerance conforms to ISO 11922-1.

According to ISO 727-1 the minimal cement lengths are as shown in the table:

Pipe outside diameter / Socket inside diameter d (mm)	Minimal cement length L (mm)
6	12.0
8	12.0
10	12.0
12	12.0
16	14.0
20	16.0
25	18.5
32	22.0
40	26.0
50	31.0
63	37.5
75	43.5
90	51.0
110	61.0
125	68.5
140	76.0
160	86.0
200	106.0
225	118.5
250	131.0
280	146.0
315	163.5
350	183.5
400	206.0

#### Recommendation for solvent cement jointing of PVC-U fittings of dimensions 250 - 400 mm

PVC-U solvent cement fittings d250 to d280 from GF are designed and tested for a nominal pressure of PN10 (10 bar). The dimensions d315 to d400 are designed and tested for a nominal pressure of PN6 (6 bar).

Our experience and tests reveal that pipes above d315 can be slightly oval, which can produce a heightened cementing gap. GF therefore recommends that pipes from dimensions d315 should be operated at max. 6 bar working pressure.

Please also note the special remarks for dimensions 250 - 400 in the following jointing instructions.

#### Tools and equipment

<b>Pipe cutter Type KRA</b>	d10 - 63 d50 - 110 d110 - 160	790 109 001 790 109 002 790 109 003
<b>Pipe cutter type KS 355 Pipe cutter type KS 1600</b>	230 V / 50 - 60 Hz	790 202 001 790 109 600
<b>Chamfering tool</b>	d16-75 d32-200	799 495 145 799 495 146
<b>Cleaner</b>	1 litre tin	799 298 010
<b>Tangit PVC-U solvent cement</b>	0.125 kg tin 0.25 kg tin 0.50 kg tin 1.0 kg tin	799 298 000 799 298 001 799 298 002 799 298 003
<b>Brush sizes</b>		
Pipe outside diameter in mm	Brush	
6-10	Round brush ø4 mm	799 299 001
12-32	Round brush ø8 mm	799 299 002
40-63	Flat brush 1" 25 x 3 mm	799 299 003
75-225	Flat brush 2" 50 x 5 mm	799 299 004
250-400	Flat brush 3" 75 x 6 mm	799 299 005
<b>Tin lid</b>		799 298 028
<b>White absorbent paper</b>	commercially available	
<b>Solvent resistant protecting gloves,</b>	commercially available	
<b>Safety glasses</b>		



Solvent cementing equipment

### PVC-U Tangit and cleaner: Amounts required

Pipe diameter d (mm)	PVC-U Tangit amount per 100 joints (kg)	PVC-U Tangit number of joints per tin 1 kg
16	0.4	250
20	0.5	200
25	0.6	166
32	0.8	125
40	1.1	91
50	1.5	72
63	1.7	59
75	2.2	45
90	4.0	25
110	8.0	12
140	13.0	7
160	19.0	5
200	24.0	4
225	26.0	3.5
250	31.0	3
280	38.0	2.5
315	52.0	2
355	62.0	1.6
400	75.0	1.2

Pipe diameter d (mm)	Tangit cleaner amount per 100 joints (litre)	Tangit cleaner number of joints per tin 1 litre
16	0.2	500
20	0.3	333
25	0.4	250
32	0.5	200
40	0.7	143
50	0.9	111
63	1.1	91
75	1.3	77
90	1.4	71
110	1.7	59
140	2.1	48
160	2.5	40
200	3.5	29
225	4.5	22
250	5.5	18
280	6.5	15
315	10.2	10
355	14.0	7
400	18.0	5

**Note:** The quantities specified above are to be understood as practice-orientated maximum values. In principle the quantities depend on gap dimensions, temperatures, working technique.

### Preparations



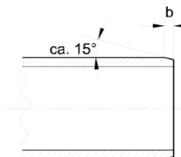
Cutting the pipe to length



Chamfering the pipe

The pipe must be cut off at right angles. Remove the inside edges and chamfer the outside ones as illustrated in the sketch. Only then is an optimal solvent cemented joint possible.

**Important:** Well-chamfered pipe ends prevent the layer of cement from being removed as the pipe is inserted into the fitting.



Pipe outside diameter mm	b
6 - 16 mm	1 - 2 mm
20 - 50 mm	2 - 3 mm
63 - 225 mm	3 - 6 mm
250 - 400 mm	6 - 8 mm



Marking the jointing length

Wipe the outside of the pipe and the inside of the socket with a clean cloth to remove obvious dirt. Marking the jointing length on the pipe end makes it possible to check afterwards whether the pipe has been inserted to the full extent of the socket.

**Note:** If the outside diameter of the pipe and the inside diameter of the socket are at opposite extremes of their tolerances, then the pipe cannot be inserted dry into the fitting socket. This will only become possible once the cement has been applied.



Checking the cement

The Tangit PVC-U cement is supplied ready for use. Stir thoroughly before using! Cement of the correct consistency will run evenly from a wooden spatula held at a slant. Cement which no longer runs smoothly is unusable. The cement must not be thinned.

For more information please consult the safety datasheets under the following link:  
[www.sdb.henkel.de/index.cfm](http://www.sdb.henkel.de/index.cfm)

Cement and cleaner should be stored in a cool, dry place (5–35 °C)! Under these conditions the cement and cleaner are durable for 24 months starting from the date of filling (imprinted on the tin).

### Cementing

Clean the outside of the pipe end and the inside of the socket **thoroughly** with Tangit cleaner and absorbent paper. Use a fresh piece of paper for each component. Remove any condensation which may have formed on the parts.

**Important:** Pipe end and fitting socket must be dry and free from grease and dirt and must not be touched after cleaning.



Cleaning the pipe and socket

PVC-U pipes may have a waxy surface. To ensure proper jointing in such a case the cleaning process must be repeated until the pipe surface becomes matt to the eye.

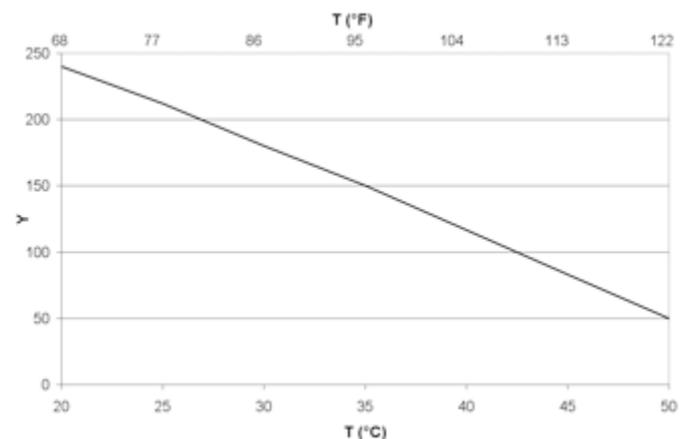
For the range of dimensions d250 - 400, mechanical machining of the pipe surface can be necessary in individual cases. An indication of inadequate jointing quality, which could be expected, is absence of or insufficient adhesion of the jointing parts following fine cleaning ("finger-nail check"). The jointing surfaces should then be roughened evenly with emery cloth of grain 80 or finer, observing the max. permitted gap.

PVC-U pipes should be cemented at temperatures between 5 °C and 40 °C. Take the following protective measures if the temperatures deviate from the above:

At lower temperatures, condensation or frost which may have formed must be removed, e. g. with warm air. Cement and cleaner should be stored at room temperature.

Avoid uneven overheating (→ shorten the opening time) when cementing at higher temperatures by protecting the jointing area from direct sunlight.

The quick curing time of the cement necessitates that the joint is made within the opening time after application of the cement has started. The opening time of the PVC-U cement varies with the ambient temperature and the thickness of the cement applied:



T Temperature in °C, °F

Y Opening time [sec]

**Remark:** When using Tangit Express the opening time is shortened at 20 °C to 1 minute and at 40 °C to 30 seconds. Therefore the maximum dimension is limited to 110 mm .



Applying the cement

Begin by applying a normal layer of cement to the fitting socket and then a thicker one to the pipe end with firm brush pressure. **Work in well.** The brush strokes should always be in an axial direction.

To ensure that both jointing surfaces are completely covered with a smooth, even layer of cement, the brush should be generously loaded with cement.

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### Range of dimensions up to d75

#### Apply cement

The cement joints can be produced by one person.

#### Jointing

After the cement has been applied, insert the pipe to the full depth of the socket immediately without twisting and bring them into the correct alignment. Ensure that the outlet of the fitting is in the correct position. Hold them briefly in this position to allow the cement to set.

#### Waiting time between cementing

Wait at least 5 minutes before the next joint, extend the waiting time at temperatures under 10 °C to 15 minutes.

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### Range of dimensions d90 to d225

#### Apply cement

The fitting socket and end of pipe should be coated with cement simultaneously by two persons, otherwise the opening time of the cement cannot be observed.

#### Jointing

After the cement has been applied, insert the pipe to the full depth of the socket immediately without twisting and bring them into the correct alignment. Ensure that the outlet of the fitting is in the correct position. Hold them briefly in this position to allow the cement to set.

#### Waiting time between cementing

Wait at least 5 minutes before the next joint, extend the waiting time at temperatures under 10 °C to 15 minutes.

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### Range of dimensions d250 to d400

#### Apply cement

Deviating from the usual method of application, pour the cement directly from the tin onto the middle of the cementing surface and distribute first radially and then axially all over with a flat brush. Make sure that the cement layer is consistent and covers the entire surface as appropriate for the larger tolerances.

Apply a thinner layer of Tangit in the fitting than on the pipe ends. The cementing of pipe work in this range of dimensions should be carried out by at least 2 persons. The minimum thickness of the cement layer for fittings is 1 mm, apply more generously on the pipe ends.

#### Jointing

After applying the cement, the pipe and fitting should be slowly pushed together to the stop or the mark without twisting by 3-4 persons and aligned. Ensure that the outlet end of the fitting is in the correct position. Hold the joint in this position for 1 minute.

#### Waiting time between cementing

A waiting time of 15 minutes should be observed before further jointing; this time should be increased to 30 minutes at temperatures below 10 °C.



Replace the lid of the cement tin during work breaks

Remove any surplus cement immediately, using absorbent paper.

A bead of excess solvent cement around the complete external circumference of the joint and a slightly smaller bead again around the complete internal circumference show that the joint has been performed correctly.

After use, clean the brush of excess cement with dry absorbent paper and then clean thoroughly using TANGIT cleaner. Brushes must be dry before being re-used (shake out).

Replace the lid of the cement tin after use to prevent the solvent evaporating. Using the conical lid allows leaving the brush in the cement tin during breaks.

Both solvent cement and cleaner dissolve PVC-U. Pipes and fittings must therefore not be laid on or allowed to come into contact with spilled cement or paper containing cement residues.

Do not close off cement pipelines during the drying process. This is particularly important at temperatures below + 5 °C, when there is otherwise a danger of damaging the material.

After the drying process (see waiting times in the following table) the pipelines can be filled. To remove extant solvent vapour, it is recommended to flush the pipeline before use.

For pipes that are not put into immediate use, it is recommended, after careful cleaning, to fill them with water and flush regularly.

Do not use compressed air for flushing.

### Drying period and pressure testing

The drying period of the cement before application of the test or working pressure depends on the drying temperature, the dimension and the fit conditions.

The waiting times required between completing the last joint and the pressure test are specified in the following table.

If the pipe is only subjected to the operating pressure, e. g. after adaptation or repair work, the following rule of thumb for the drying waiting time applies:

**1 hour waiting time per bar operating pressure.**

For temperatures above 20 °C the test pressure must be reduced according to the requirements given in the chapter "Final testing and commissioning".

**Remark:** When using Tangit Express (only up to d110) the waiting time is shortened to 12 hours, or 1/4-hour waiting time per bar operating pressure.

Dimension	Nominal pressure (PN) of fitting 20 °C, water	Max. working pressure 20 °C, water
up to d225	PN10 or PN16	10 or 16 bar
d250	PN10	10 bar
d280	PN10	10 bar
d315	PN6	6 bar
d350	PN6	6 bar
d400	PN6	6 bar

Dimension	Max. test pressure 20 °C, water	Waiting time after last cementing until test
up to d225	15 or 21 bar	15 or 24 h
d250	15 bar	24 h
d280	15 bar	
d315	9 bar	
d350	9 bar	
d400	9 bar	

### Safety precautions

Tangit cement and Tangit cleaner contain highly volatile solvents. This makes good ventilation or adequate fume extraction essential in closed spaces. Since the solvent fumes are heavier than air, extraction must occur at floor level, or at least below the working level. Place paper which has been used for cleaning or for the removal of surplus cement into closed containers to minimise the amount of solvent fumes in the air.

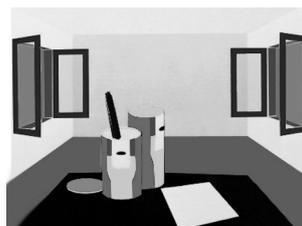
Cement and cleaner are inflammable. Extinguish open fires before commencing work. Switch off unprotected electrical apparatus, electric heaters, etc. Avoid static charge. Do not smoke! Discontinue any welding oper-

ations. Furthermore, observe all instructions issued by the solvent cement manufacturer (e. g. label of the tin and any supplementary documentation).

Protect pipes and fittings from spilled solvent cement, cleaner and absorbent paper which has been used to wipe off cement. Do not dispose of surplus solvent cement or cleaner in drainage systems.

The use of protective gloves is recommended to avoid contact with skin. If the cement or the cleaner get in contact with eyes, rinse immediately with water. Consult a doctor! Immediately change clothes that have solvent cement on them.

Always obey the safety regulations issued by the authorities responsible.



Adequate ventilation of the workplace



No open flames when cementing. No smoking.