

# 13<sup>th</sup> DUTCH OPEN KNW DRILLING & TAPPING CHAMPIONSHIP

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Aquatech Amsterdam  
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## OFFICIAL RULES AND REGULATIONS

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## **1 CHAMPIONSHIP AND ORGANISATION**

- 1.1 All teams participating in the championship must ensure they are fully conversant with these regulations. Published on the website [www.h2owaternetwerk.nl](http://www.h2owaternetwerk.nl) latest Dutch version of these regulations is final and is therefore over other publications, such as a translation, instruction movie and the like.
- 1.2 The object of the championship is to complete the following task, drilling and tapping a ductile iron main under pressure, together with the installation of a service connection including water meter and tap, in the shortest possible time. Quality of workmanship and the compliance with manufacturers operating instructions, safety procedures and hygiene requirements will be paramount. Time penalty points will be added to each team's finishing time in respect of any defect observed or infringement of the Regulation.
- 1.3 A team consists of two fitters and possibly a coach. Team members must be employees of a water company.
- 1.4 Each Water Company can participate with one team. An additional team may be invited at the discretion of organisation, subject to further place allocations being available.
- 1.5 There will be a time limit of ten minutes for each round of the championship. The attempt will be stopped by the head referee if the team is not successful in producing running water from the tap within ten minutes.
- 1.6 All teams must register to the contest leader at the championship stand at least thirty minutes before their allocated starting time. Failure to do so results in a 60 second time penalty (according 15.4g) and may result in disqualification. Teams should make due allowance for any traffic delays throughout their journey as there will be little opportunity to re-schedule starting times on the day of the competition. Rescheduling of late arrivals will be at the discretion of the contest leader.
- 1.7 Only a Dutch team can win the prize: participation in the open Drilling & Tapping championships in Birmingham, UK.

## **2 COMPETITION AREA**

- 2.1 Only participating teams will be allowed within the competition area. If during the attempt colleagues from the participating team entering the competition area produces automatically a time penalty of 60 seconds (according 15.4g) for the team.
- 2.2 The coach may encourage team members and/or give instructions during the contest. The coach may only carry a stopwatch while supporting his team. The coach should in no way be involved in the implementation of the competition. Any contravention of this rule will result in an automatic 60 seconds time penalty to the team (according 15.4g).
- 2.3 Favours other team's results in a time penalty of 60 seconds (according 15.4g) for both teams. Hindering other teams and/or the jury delivers a time penalty of 60 seconds (according 15.4g) and can by serious intent lead to disqualification of that team.
- 2.4 Only referees involved in the contest are allowed in the competition area. Up to one photographer or cameraman, with the permission and under the direction of the head referee, be present during a contest in the competition area.
- 2.5 Up to two employees of the organization may after a attempt assist referees with cleaning materials and tools.

### 3 CONTEST

- 3.1 Only women and men teams will be allowed a second opportunity within two hours after the first attempt. The second opportunity is not mandatory. The time of the first or the fastest (including time penalty) opportunity will be registered as result of the competition.
- 3.2 Information about application of the materials and equipment mentioned in chapter 16 can be found on the website: [www.h2owaternetwerk.nl](http://www.h2owaternetwerk.nl).
- 3.3 Each team is allowed a ten minutes preparation time to check materials and equipment. In the event of any equipment being unsatisfactory, it must be drawn to the attention of the contest leader immediately. The contest leader decides on replacement.
- 3.4 All connections must be watertight and made in accordance with the manufacturers recommendations.
- 3.5 Prior to the attempt all equipment, tools and materials must be positioned on the floor by the team beside the pipe to be tapped. Team members may stand or kneel on the floor but shall not be touching any piece of the equipment, rig or tools prior to the start. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).
- 3.6 Prior to the attempt tools are not allowed to be in contact with either materials or tools. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).
- 3.7 Only the screw thread of the ferrule and tap must be wrapped with tape. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).
- 3.8 The use of (own) lubricants is not allowed. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).
- 3.9 The application of markings on materials and tools and assembling (loose) material components prior to the attempt is not allowed. Exception to this rule is regulation 6.8. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).
- 3.10 There is no such thing as equipment failure! BEWARE! This is a contest of quality, skill and ability as well as speed.
  - a. All equipment utilised in the championship will be new, and as such, will be in good condition.
  - b. All tools, equipment and other supplies provided for the championships, which are broken by the team, will be considered to be damaged by their neglect and there will be not opportunity for a second attempt.
  - c. Intentionally wrong use of tools and equipment will be considered to be a safety violation and will results in a time penalty of 30 seconds (according 15.4e). For the correct use of equipment and tools: see chapter 16.
  - d. Throwing or dropping the components of the Service Valve and Drilling Machine and throwing or dropping materials and tools is considered a violation of safety regulations and provides for a time penalty of 30 seconds (according 15.4d).
  - e. Only tools and materials supplied for the contest can be used. Non compliance with this rule results in a time penalty of 60 seconds (according 15.4g).
- 3.11 The timing of the event shall begin at the head referee's signal and shall finish when water discharges from the tap. At that moment the head referee will call "STOP" and this means the end of the attempt. Both fitters should immediately stop the attempt and together with their coach leave the competition area. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4f). This to give the referees the opportunity to judge the attempt. Each part which is not finished according to the regulations will be penalised with penalty seconds, according to rule 15.4. Only the coach is allowed to argue his team result with the (head) referee.

- 3.12 The head referee will see to it that all tools, materials and team members are in the required positions prior to the start. The contest leader will also ensure that for each attempt the work area is free from standing water, materials and tools.

#### **4 DUCTILE IRON PIPE**

- 4.1 The pipe to be tapped is a 150 mm Ductile Iron pipe, C100, cement lined, capped on each end, filled with water and pressurised to local water pressure.
- 4.2 The pipe will be put on wooden support blocks. The top of the pipe will be at approx 62 cm above the floor. The support blocks are made to maximise support to the pipe.

#### **5 DRILLING**

- 5.1 The Service Valve and Drilling Machine will be provided complete with accessories, including drilling taps. Drilling taps are new or are in good condition revised.
- 5.2 The Service Valve and Drilling Machine may be inspected, cleaned and lubricated if necessary by the team prior to the start. Lubricant will be supplied. The drill tap will be chosen by the team from an available supply of drilling taps provided and this will be prior to the attempt assembled in the drill shaft by the contest leader.
- 5.3 The saddle, the service valve with chains, the drilling machine and the plug insertion with fitting spindle must be in contact with the floor and are not allowed to be in touch with either tools or materials. Non compliance with this rule will result in a time penalty of 30 seconds ( according 15.4f).
- 5.4 Tapping the pipe should be in accordance with the operation manual of the supplier. Interpretation of the manual and instructions is reserved to the referee.
- 5.5 The service valve must be securely located with the use of chains before drilling commences. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 5.6 Both chains must be placed in the hooks with two links. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 5.7 The chain nuts must be fixed and loosened with the valve spanner. Non compliance with this rule will result in a time penalty of 30 seconds ( according 15.4e). Using the chain steady spanner and shaft locking screw is also not required.
- 5.8 Both nuts from the service valve knuckle must be tightened with the valve spanner, when placing the drilling machine and the plug insertion. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 5.9 The ratchet belonging to the Service Valve and Drilling Machine must be used to bring the drill tap into the pipe. Non compliance with this rule will result in a time penalty of 30 seconds ( according 15.4e).
- 5.10 After application of the ferrule remove first the fitting canopy from the service valve. Non compliance with this rule will result in a time penalty of 60 seconds (according 15.4g).

## **6 FERRULE**

- 6.1 The ferrule is a brass ferrule ½" x 1" with flat top union nut. This flat top union nut must be hand tight mounted on the ferrule prior to the attempt. Non compliance with this rule will result in a time penalty of 20 seconds ( according 15.4b).
- 6.2 Applying tape to the ferrule should be made during the attempt. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 6.3 During the competition, the ferrule should be mounted in the ferrule carrier. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 6.4 The ratchet associated with the Service Valve and Drilling Machine must be used to bring the ferrule into the pipe. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 6.5 The ferrule may not be fixed / tightened with the ratchet and fitting spindle. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 6.6 After the Water Drilling Machine has been removed, the ferrule must be inserted deep enough into the pipe with the use of a wrench that is supplied. Not more than 6.3 mm (height) thread may be exposed. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4c). The decision of the jury in this is final.
- 6.7 The ferrule must be installed in closed position. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 6.8 The ferrule must be placed at a right (90 degrees) angle allowing 3 degrees either way. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 6.9 The rubber joint ring on top of the ferrule may be left inside. This is not considered a violation of rule 3.9.
- 6.10 The top union nut of the ferrule must be tightened with the adjustable wrench that is supplied. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 6.11 The ferrule tool must be separate from the ferrule at the time that the head referee stopped the attempt. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).

## **7 PE SERVICE PIPE**

- 7.1 The length of the PE service pipe measured between the centre of the ferrule to the back edge of the water meter holder must be 1 meter with a tolerance of plus and minus 5 mm, see also Figure 1, in Chapter 17. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 7.2 The three pieces of PE service pipe must be fitted in extension, meaning the shortest possible connection from ferrule to the wall plate. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 7.3 Both pipes in the elbow joint must be respectively horizontally and vertically. A maximum of 3 degrees on either side is allowed. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 7.4 During the preparation time no more than 5 cm from the pipe ends may be cut. Non compliance with this rule results in a time penalty of 30 seconds (according 15.4f).

## **8 WATER METER HOLDER**

- 8.1 An integrated water meter holder fitted to the floor plate will be supplied to the contestants. The contestants should check the nature of the holder before the attempt starts. An incorrect applied water meter holder cannot lead to a new attempt.
- 8.2 The supplied wrench must be used to apply the drain valve and drain plug. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 8.3 The supplied adjustable wrench must be used to tighten the union nuts to the water meter. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).

## **9 WATER METER**

- 9.1 It must be possible to read the water meter at a right angle (90 degrees). The visual display must be horizontal. A maximum of 3 degrees either way is allowed. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 9.2 The protection lids on both sides of the water meter may be removed only during the attempt. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 9.3 The non-return valve is considered to be an integrated part of the water meter. Not or incorrect assembling will result in a time penalty of 30 seconds (according 15.4f).

## **10 JOINTS**

- 10.1 The adjustable wrench must be used to tighten the six sided union nut onto the six sided part of the joint PE 25 x 3/4". Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e). The ribbed union nut of the joint PE 25 x 3/4" on the PE pipe-side can be tightened by hand, only the use of a supplied pipe wrench is allowed.
- 10.2 The ribbed union nut of the joint PE 25 x 3/4" must be tightened to the end of the thread until thread is no longer visible. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 10.3 The adjustable wrench must be used to tighten the six sided part of the joints PE 25 x 1" Type A2 and the supplied pipe wrench must be used to tighten the ribbed part of the joint PE 25 x 1" Brass type 115. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e). The adjustable wrench must be used to tighten the six and eight sided union nuts onto the PE side of the joints. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 10.4 The six sided union nut of the joint PE 25 x 1" Brass type 115 may, after mounting a maximum of a quarter turn (90 °) can be further tightened. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 10.5 The insert of the joint PE 25 x 1" type A2 must be beaten into the PE pipe with the plastic hammer. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 10.6 The insert of the joint PE 25 x 1" type A2 must be completely beaten into the PE pipe. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).
- 10.7 Marking the push depth on the PE pipe is not required.
- 10.8 The PE service pipe must be mounted till the bottom of the joints. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).



## **11 ELBOW JOINT**

- 11.1 Marking the push depth to the PE pipe is not required.
- 11.2 The PE service pipes must be mounted till the bottom of the joint. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).

## **12 TAP**

- 12.1 Applying tape to the tap should be made during the attempt. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 12.2 The tap may be tightened by hand, only the use of an adjustable wrench is allowed. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e).
- 12.3 The exit side of the tap must point downwards in an angle of 90 degrees, allowing a maximum of 3 degrees either way. Non compliance with this rule will result in a time penalty of 20 seconds (according 15.4b).

## **13 SAFETY AND HYGIENE**

- 13.1 The usual safety precautions used within the water sector will have to be followed in the competition area.
- 13.2 Each team will supply its own safety means and use them in the following manner:
  - a. Each fitter in the competition area must wear permanently single or two-piece overalls. Sweaters, shirts, t-shirts with long sleeves are allowed as upper part of the overall. Short-sleeved shirts are not allowed. In case of non compliance with this rule the fitter will be refused access to the competition area and this may lead to disqualification. Sleeves must cover forearms at all times in the competition area. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4d).
  - b. Each fitter and coach in the competition area must wear permanently at least class S2 safety boots or shoes according to EN ISO 20345. In case of non compliance with this rule will be refused access to the competition arena and this may lead to disqualification.
  - c. Each fitter in the competition area must wear permanently at least class 2121 safety gloves according to NEN EN 388. In case of non compliance with this rule the fitter will be refused access to the competition area and this may lead to disqualification. Gloves may be replaced only once and only during the preparation time. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4d).
  - d. Each fitter and coach in the competition area must wear permanently eye protection (safety glasses). In case of non compliance with this rule the fitter will be refused access to the competition arena and this may lead to disqualification.
  - e. Each fitter and coach in the competition area must wear permanently a safety helmet according to NEN EN 397 or bump cap according to NEN EN 812. In case of non compliance with this rule the fitter will be refused access to the competition arena and this may lead to disqualification.
  - f. When a fitter or coach losing eye protection, safety helmet or bump cap during the contest, they must put these back on without delay. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4d).



- 13.3 If a fitter injures himself by improper use of materials or tools during a contest, this is considered a violation of safety rules and therefore gets a time penalty of 30 seconds (according 15.4d).
- 13.4 The usual hygiene rules within the drinking water sector should be applied during the preparation time and contest. It is not allowed to e.g. put materials in the mouth, blow in and/or materials, use grease or oil on materials which come into contact with drinking water. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4d).

## **14 ASSESSMENT**

- 14.1 The assessment of an attempt during the contest is done by a jury of 1 head referee and 2 referees. A contest leader will, if necessary determine time penalties together with the head referee.
- 14.2 The referees are responsible for recording the time used during an attempt. The head referee announces the beginning and the end of an attempt. Time is registered up to 1/10 of a second. The average time of the three recordings will be the official result of the attempt. In the case of two teams having equal results, the team with the least penalty seconds will win.
- 14.3 The jury will pay close attention to violations of safety regulations during the attempts and can give a time penalty. The referees will also pay close attention to violations of safety regulations during preparations for an attempt.
- 14.4 Leaking connections will be covered with a cloth during assessment to prevent other connections from getting wet. If this solution is not sufficient, the referees are allowed, after consulting the head referee, to tighten the connection themselves in order to prevent further inconvenience.
- 14.5 In the event of a major leak occurring during the attempt, which affects other competitors or bystanders, the referees can turn off the water supply to that particular rig. If assessing the attempt is not possible, the time off the attempt will be "NO TIME".
- 14.6 In case of a very small leak (it is difficult to establish leakage) the 10 seconds -rule will be applied. No time penalty will be added if within 10 seconds of drying the presumed leak no water appears.
- 14.7 If necessary, the connections constructed during the attempt will be loosened by the referee to establish if the application complies with the safety rules and regulations. The referees and/or assistants dismantle the rig and clean the materials and tools.
- 14.8 The contest will be assessed by competent officials who will have to take decisions during the contest. Referees are human beings and they will do their job as fair as possible to all competitors. The aim of the competition is a fair and equal treatment of each and every team. No team will be favoured over another team.

## 15 PENALTIES

- 15.1 Penalty time can be given in case of violation of these rules and regulations or in cases of violation of safety rules.
- 15.2 Penalty will be in the form of a number of penalty seconds added to the registered time used for an attempt. The official time is the total sum of registered time and penalty seconds.
- 15.3 Teams without the compulsory safety means (see chapter 13) will not be allowed to enter the championship.
- 15.4 The following time penalties (*In this version of the regulations are there including more emphasis on safety and hygiene*) will be added to the registered time:
- |                                                                       |               |
|-----------------------------------------------------------------------|---------------|
| a. a leak                                                             | + 20 seconds; |
| b. incomplete connection or not according to manual                   | + 20 seconds; |
| c. more than 6,3 mm thread visible at the ferrule                     | + 20 seconds; |
| d. non compliance of hygiene- and safety rules or dangerous behaviour | + 30 seconds; |
| e. incorrect use of tools                                             | + 30 seconds; |
| f. procedural violation by the team                                   | + 30 seconds; |
- Note! This general penalty is applied to all members of a team disrupting the contest in any way. The penalty can be applied in appropriate situations, not mentioned specifically in these rules and regulations, disrupting an ongoing contest in any way.*
- |                                                             |               |
|-------------------------------------------------------------|---------------|
| g. non compliance to rules 1.6, 2.1, 2.2, 2.3, 3.9e or 5.11 | + 60 seconds. |
|-------------------------------------------------------------|---------------|
- 15.5 If the ferrule blows out of the pipe or any connection blows apart before judging is complete, the time off the attempt will be "NO TIME".
- 15.6 By disagreement about a given time penalty, the head referee judgement is binding.
- 15.7 A decision by the head referee is final.

## 16 EQUIPMENT AND MATERIALS

The organisation of the Open Dutch Drilling Championship will supply all equipment and materials, other than personal safety equipment. Below a list of these materials and equipment, including the limited usage of the equipment. Non compliance with this rule will result in a time penalty of 30 seconds (according 15.4e). Please take notice of sketches, numbered 2008-07102-002 dated 2-3-2015, in Chapter 19.

### List of equipment

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<u>Equipment</u>	<u>Use</u>
ALH IPCO Water Service Valve and Drilling Machine with accessoires	Drilling, tapping, and inserting ferrule
Ratchet spanner with 1" socket	Tightening chain of drilling machine
Folding rule 1 meter	Measuring PE pipe length
PE pipe cutter	Cutting PE pipe
PE Bevel	Beveled PE pipe
Adjustable wrench (2 pieces)	Fasten tap, union nuts of water meter, six sided union nut and the six sided part of the joint PE 25 x 3/4", six sided part of the joints PE 25 x 1" model A2 and six and eight sided union nut of joints PE 25 x 1"
Spanner 24 x 19 mm	Fasten ferrule in ductile iron pipe
Spanner 17 mm	Fasten drain valve and drain plug
Pipe wrench 9" (2 pieces)	Fasten joints PE 25 x 1" type 115 and ribbed union nut on joint PE 25 x 3/4"
Ferrule tool (Conval)	Operating ferrule
Plastic hammer	Beat insert into PE pipe
Paint marker white (Edding 750)	Marking push depth synthetic joint PE 25 x 1" and elbow joint

### List of materials

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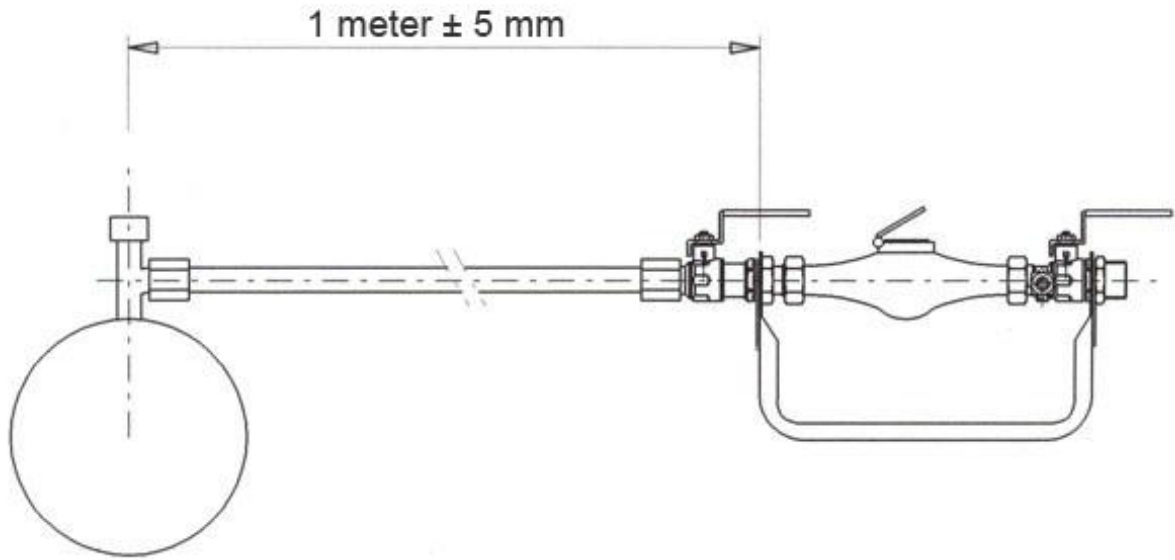
Saint-Gobain:	Natural ductile iron pipe 150 mm type C100
Beulco:	2 brass joints PE 25 x 1" in type A2 with loose insert
Beulco:	2 synthetic gaskets 1"
HSF:	1 brass joint PE 25 x 1" in Isiflo Brass type 115
HSF:	1 rubber gasket 1"
HSF:	1 synthetic elbow joint PE 25 x PE 25 Isiflo Sprint type 120
Dyka:	1 synthetic universal floor plate for meter cupboard
Watts:	1 water meter On 1,5 with loose non return valve
Conval:	1 water meter holder On 1,5 including 1" ball valve and 3/4" ball valve with drain valve
Conval:	1 drain valve 1/4" ex
Conval:	1 brass drain plug 1/4" ex
Conval:	1 brass ferrule 1/2" ex x 1" ex (3/4" opening) with flat top union nut
Conval:	1 brass joint PE 25 x 3/4" in type TK with loose nut
Conval:	PE pipe 25 x 2,3 mm SDR 11, length 2 meters
Conval:	1 brass wall plate 3/4" in x 1" ex
Conval:	1 brass rectangular tap 3/4" ex
Conval:	3 rubber gaskets 3/4"
Conval:	2 fiber gaskets 1/4"
Conval:	1 roll Teflon tape



**Complete training kits are available at Conval Nederland B. V. (see [www.conval.nl](http://www.conval.nl)).**

**SKETCHES**

Sketch 1



## Brass joint PE 25 x 3/4" in with loose nut



**Type TK**

1. Cut pipe square
2. Chamfered pipe end if necessary
3. Loosen union nut slightly
4. Push pipe totally into the joint
5. Fasten union nut until there is no longer visible thread



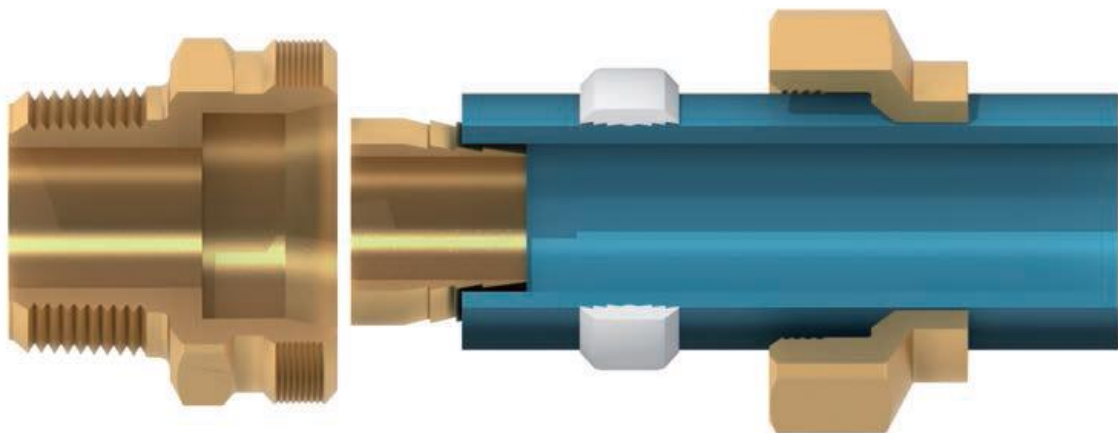
## Brass joint PE 25 x 1" in

# BEULCO

**HOLLAND**



**Type A2**



1. Cut pipe square
2. Push forcing nut onto the pipe
3. Push clamping ring onto the pipe
4. Beat the insert completely into the pipe
5. Push pipe totally into the joint
6. Tighten forcing nut firmly





## Brass joint PE 25 x 1" in and synthetic elbow joint 90° PE 25 x PE 25

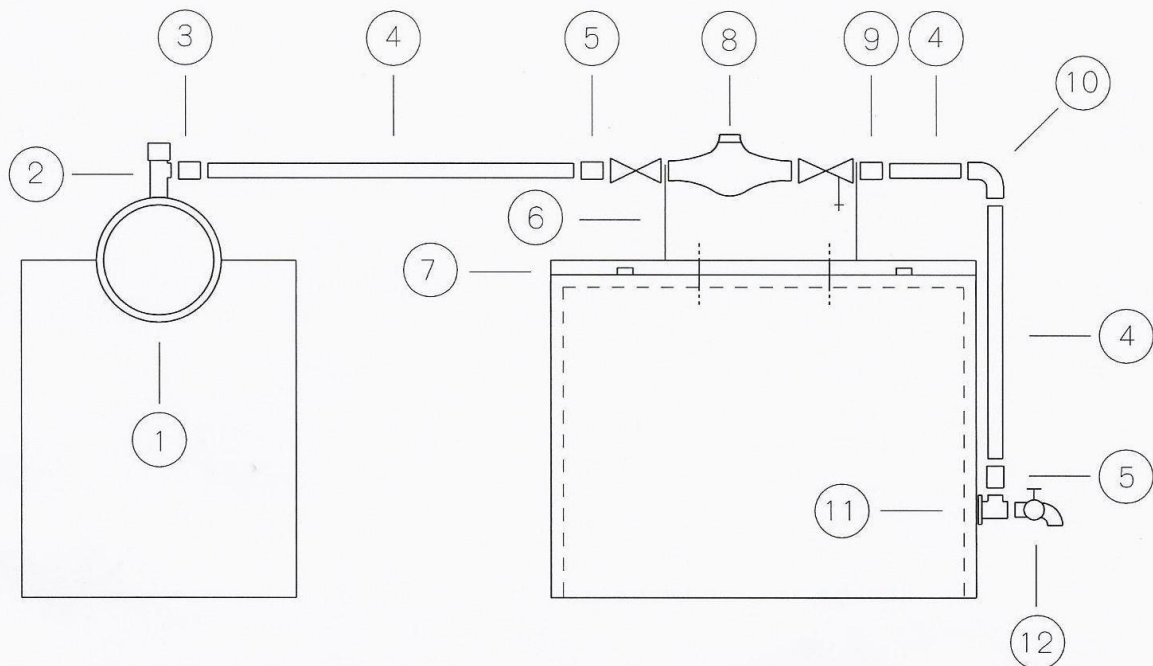


**Isiflo Brass type 115**

**Isiflo Sprint type 120**

1. Cut pipe square
2. Mark push depth if necessary
3. **By Isiflo Brass:** Loosen the nut, **don't** dismantle
4. Push pipe totally into the joint with a slight twist with your hands
5. **By Isiflo Brass:** Tighten the nut against the body



**19 DETAIL DRAWING**


- 1. SAINT GOBAIN natural ductile iron pipe 150 type C64
- 2. CONVAL brass ferrule 1/2"ex x 1"ex with flat top union nut
- 3. HSF brass joint PE 25 x 1" in Isiflo Brass type 115
- 4. CONVAL PE pipe 25 x 2,3 mm SDR 11, length 2 meters
- 5. BEULCO brass joint PE 25 x 1" in model A2 with loose insert
- 6. CONVAL water meter holder Qn 1,5 including 1" ball valve and 3/4" ball valve with drain valve
- 7. DYKA synthetic universal floor plate for meter cupboard
- 8. WATTS water meter Qn 1,5 with loose non return valve
- 9. CONVAL brass TK joint PE 25 x 3/4" in with loose nut
- 10. HSF synthetic elbow joint PE 25 x PE 25 Isiflo Sprint type 120
- 11. CONVAL brass wall plate 3/4" in x 1" ex
- 12. CONVAL brass rectangular tap 3/4" ex



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WERKTEKENING FITTERIJWEDSTRIJD

