

AVK SERIES 36 GATE VALVE, PE PIPE ENDS



AVK SERIES 36 TRIAL INSTALLATION REPORT

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AVK SERIES 36 TRIAL INSTALLATION REPORT

COMPARING THE INSTALLATION PROCESS OF THE AVK SERIES 36 PE-TAILED GATE VALVE AGAINST TWO COMPARABLE FLANGED GATE VALVE INSTALLATIONS.

On the 3rd of May 2023 at McCrae Training in East Kilbride, UK, representatives of AVK recorded and timed three trial installations of gate valves. The installations were undertaken by Danny McDermott, Training Programme Development Lead for McCrae Training. The purpose of this exercise was to ascertain the length of time for each installation and to determine whether the AVK Series 36 PE-Tailed Gate Valve is faster and more efficient to install than comparable flanged gate valve installations.

All three installations took place in a purpose-built training trench that McCrae Training has created at their site to train contractors. Throughout we used the same 100mm diameter, industry standard, PE water pipe. Weather conditions were relatively dry with an occasional fine drizzle of rain throughout the day, with temperatures not exceeding 17 degrees Celsius. All installations were undertaken by Danny McDermott with occasional support, when required. All installations were recorded on three video cameras, located at varied angles, by Videographer Dean Hodson of the Image Factory. Times were logged by Mike Marshall from strategic branding agency, eatsleepthink.

Manual tools were used to perform each installation, rather than powered tools. Some exceptions were made for the purposes of capturing the installation on video e.g. a shallower training trench at a fixed width of 500mm was used so that cameras could easily capture all aspects of the installation. Furthermore, the electrofusion box, used for two of the installations, would normally be located within a shelter in case of poor weather conditions, but for the purposes of filming and capturing the process the unit was used without cover. All electrofusion times are taken from the manufacturer's guidelines supplied with the couplers, for both PE installations these are 3 minutes for pipe fusion and 10 minutes for cooling.

Best practice installation techniques were used throughout. Best practice included wearing PPE and disinfecting tools, pipe and installation materials when required. We endeavoured throughout to ensure that we replicated, as close as possible, an 'on-site' installation.

The three types of installation are as follows:

1. A flanged gate valve with PE Stub Flanges and Electrofusion Couplings fused onto a DN100 industry standard PE water pipe, and wrapped with Denso tape.
2. AVK Series 36 PE-Tailed Gate Valve and Electrofusion Couplings fused onto a DN100 industry standard PE water pipe.
3. Flanged Gate Valve with Tensile Resistant Flange Adapters, SDR11 Pipe Liners manually fixed onto a DN100 industry standard PE water pipe, and wrapped with Denso tape.

For both flanged gate valves we applied Denso tape to the exposed bolts and joints. After consultation with industry experts, the application of Denso tape was viewed to be best-practice to protect bolts from corrosion. We deemed it important to use Denso tape on both flanged gate valves as we were attempting to make each installation as close as possible in equivalency to the AVK Series 36 PE-Tailed Gate Valve.

AVK SERIES 36 TRIAL INSTALLATION REPORT

A FLANGED GATE VALVE WITH PE STUB FLANGES AND ELECTROFUSION COUPLINGS FUSED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE, AND WRAPPED WITH DENSO TAPE.

Materials Used:

Flanged RS gate valve
2 x NP16 Bolt Sets
2 x PE Stub Flanges
2 x Electrofusion Couplings
1 roll of Denso Tape
All materials were supplied 'in bag' as would be expected in the field

Tools Used:

Handheld Torque Wrench
Hand Saw
Electrofusion Box
Pipe Clamp
Disinfectant and Disposable Paper Towels
No mechanical lifting equipment was required



Finished Installation



AVK SERIES 36 TRIAL INSTALLATION REPORT

A FLANGED GATE VALVE WITH PE STUB FLANGES AND ELECTROFUSION COUPLINGS FUSED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE, AND WRAPPED WITH DENSO TAPE.

Time Taken: 95 minutes. Potential leak paths: 2

Description	Actual Time (minutes and seconds)	Time (to nearest minute)
* One person bolting the gate valve to PE Stub Flange	15.32	16
** Two people bolting second flange to PE Stub Flange	9.31	10
Measure pipe and manually saw pipe	7.52	8
Mark pipe ends for collar one	2.23	2
Scrape pipe and apply coupling	4.53	5
Scrape PE stub and moving the valve to pipe	3.44	4
Push the PE stub onto the pipe coupling and apply clamp	2.21	2
Set-up generator, fuse first coupling and cool down	14.25	14
Mark pipe for remaining coupling	1.4	2
Scrape pipe	2.21	2
Apply Coupling, scrape PE stub, push onto trench coupling and apply clamp	7.41	8
Fuse second coupling and cool down	13.26	13
Remove clamp	3.05	3
TOTAL TIME TAKEN WITHOUT DENSO TAPE TO NEAREST MINUTE	89	
* Adjusted for two men bolting the first flange, based on ** time	6	
ADJUSTED TOTAL TIME TAKEN WITHOUT DENSO TAPE	83	
Apply Denso Tape	11.42	12
TOTAL TIME WITH DENSO TAPE	95	

Notes:

- All times have been rounded up or down to the nearest minute.
- We have provided timings with and without Denso Tape as we recognise that not all contractors will perform this task on their installations.
- The bolting of the first flange to the PE Stub Flange was performed by one person so that we could compare timings against the second flange being bolted by two people. The difference in time, 6 minutes, has been deducted from the final timings to ensure the installation is accurately recorded as a two person job.

AVK SERIES 36 TRIAL INSTALLATION REPORT

AVK SERIES 36 PE-TAILED GATE VALVE AND ELECTROFUSION COUPLINGS FUSED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE.

Materials Used:

AVK Series 36 PE-Tailed Gate Valve
2 x Electrofusion Couplings
All materials were supplied 'in bag' as would be expected in the field

Tools Used:

Hand Saw
Electrofusion Box
Pipe Clamp
Disinfectant and Disposable Paper Towels
No mechanical lifting equipment was required



Finished Installation



AVK SERIES 36 TRIAL INSTALLATION REPORT

AVK SERIES 36 PE-TAILED GATE VALVE AND ELECTROFUSION COUPLINGS FUSED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE.

Time taken: 57 minutes. No potential leaks paths

Description	Actual Time (minutes and seconds)	Time (to nearest minute)
Clean and measure PE Tails	1.5	2
Measure pipe, clean saw and cut pipe	4.09	4
Prepare pipe, measure for coupling, scrape pipe	3.27	3
Apply coupling to pipe	0.51	1
Measure for coupling on PE tailed valve and scrape pipe	2.36	3
Move valve to trench and apply clamp	1.34	2
Set-up generator, fuse first coupling and cool down	14.28	14
Prepare pipe and PE pipe for second coupling, measure up and push onto trench and PE tailed pipe, clamp the pipe	13.42	14
Fuse second coupling and cool down	13.28	13
Remove clamp	1.05	1
ADJUSTED TOTAL TIME TAKEN WITHOUT DENSO TAPE	57	

Notes:

- All times have been rounded up or down to the nearest minute.
- No Denso Tape was required.

AVK SERIES 36 TRIAL INSTALLATION REPORT

FLANGED GATE VALVE WITH TENSILE RESISTANT FLANGE ADAPTERS, SDR11 PIPE LINERS MANUALLY FIXED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE, AND WRAPPED WITH DENSO TAPE.

Materials Used:

- Flanged RS gate valve
- 2 x NP16 Bolt Sets
- 2 x Tensile Resistant Flange Adapters
- 2 x SDR11 Pipe Liners
- 1 x roll of Denso tape
- All materials were supplied 'in bag' as would be expected in the field.

Tools Used:

- Handheld Torque Wrench
- Hand Saw and Hacksaw
- Mallet
- Electrofusion box
- Pipe Clamp
- Disinfectant and Disposable Paper Towels.
- No mechanical lifting equipment was required.



Finished Installation



AVK SERIES 36 TRIAL INSTALLATION REPORT

FLANGED GATE VALVE WITH TENSILE RESISTANT FLANGE ADAPTERS, SDR11 PIPE LINERS MANUALLY FIXED ONTO A DN100 INDUSTRY STANDARD PE WATER PIPE, AND WRAPPED WITH DENSO TAPE.

Time taken: 57 minutes. Potential leak paths: 4

Description	Actual Time (minutes and seconds)	Time (to nearest minute)
Prepare and clean bolts, apply gasket and bolt flange adaptor to gate valve	9.11	9
Measure Valve, clean pipe and mark-up pipe	1.38	2
Clean saw and cut pipe	4.06	4
Wet pipe and apply flange adaptor to the pipe	2.58	3
Apply SDR11 pipe liners to pipe	7.01	7
Apply gate valve to pipe	3.51	4
Bolt remaining flange adaptor to the gate valve	11.49	12
Tighten down the backing rings on both flange adaptors	16.1	16
TOTAL TIME TAKEN WITHOUT DENSO TAPE TO NEAREST MINUTE	57	
Apply Denso Tape	16.53	17
TOTAL TIME TAKEN WITH DENSO TAPE	74	

- Notes:**
- All times have been rounded up or down to the nearest minute.
 - We have provided timings with and without Denso Tape as we recognise that not all contractors will perform this task on their installations.

AVK SERIES 36 TRIAL INSTALLATION REPORT

BENEFIT CALCULATIONS

Summary of Key Facts

Installation	Labour time (minutes)	Number of Stock Keeping Units (SKUs)	Number of nonrecyclable plastic bags used	Number of potential leaks paths
One	95	8	7	2
Two (Series 36)	57	3	2	0
Three	74	6	4	4

Speculative Quantitative Benefits

Calculating Productivity			
	Installation One	Installation Two	Installation Three
Length of time to install	95	57	74
Time between each installation (minutes)	15	15	15
Adjusted labour time to include time between each installation	110	72	89
Average working day based on 7.5 Hours (450 minutes)	450	450	450
Possible installations per day to nearest whole number	4	6	5
Potential increase in the number of Series 36 gate valves that can be installed in a day compared to installation one	50%		

Outcomes

To generate our final percentage figures we compared the AVK Series 36 PE-Tailed Gate Valve against installation one only, as this installation is the dominant current approach.

We acknowledge that our calculations are based solely on a DN100 water pipe installation. We recognize that varying pipe diameters and gate valve sizes will alter the amount of time and manpower required for both types of installation. We also acknowledge that our installation methodology and best-practice may not be indicative of every contractor's installation methods, and that certain calculations, such as productivity, may differ dependent upon individual practices.

Our calculations are presented as an indicative foundation. Even taking into account variations in methodologies and working practices, it is clear that the AVK Series 36 PE-Tailed Gate Valve provides a number of significant benefits to water companies and their contractors.

0%	POTENTIAL LEAK PATHS
40%	FASTER TO INSTALL
50%	IMPROVEMENT IN PRODUCTIVITY
71%	LESS LANDFILL WASTE
63%	REDUCTION IN STOCK KEEPING UNITS

AVK SERIES 36 TRIAL INSTALLATION REPORT

PRODUCT BENEFITS

40% faster to install

When compared to equivalent flanged gate valve installations, the AVK Series 36 requires far fewer components: no nuts, no bolts, no washers, no flanges, no stub flanges, no tape. It's a far more efficient and quicker installation process.

During independent time trials, an AVK Series 36 installation required 40% less time than an equivalent flanged gate valve. Furthermore, the AVK Series 36 installation required less physical exertion thereby reducing the 'wear and tear' on the installation team.

No potential leak paths

When compared to an equivalent flanged gate valve installation, the factory fitted and sealed PE-tailed pipes on the AVK Series 36 present no potential leak paths.

When installed using best-practice electrofusion welding, the AVK Series 36 creates a fully welded and durable pipeline that will stand the test of time. It delivers a significant reduction in non-revenue water, enhances water security, and reinforces network resilience.

50% improvement in productivity

Let's do some basic maths to identify how many valve installations can be completed by a two man team in a day. The AVK Series 36 PE-Tailed Gate Valve takes only 57 minutes to install. It takes 95 minutes to install an equivalent flanged gate valve.

A two man installation team has 450 minutes (7.5 hours) of productive time in a working day. It is given that there is an average 15 minute interval between each installation to move to the next location and set up. A two man team could install 6 AVK Series 36 PE-Tailed Gate Valves in a working day compared to 4 equivalent flanged gate valves. That's a potential productivity gain of 50%.

Imagine what that would mean over a week, or a year or AMP8!

71% less landfill waste

The removal of waste to landfill costs you money. It is also in direct opposition to the water industry's drive towards a more sustainable future.

The installation of a flanged gate valve results in seven – SEVEN – plastic bags going to landfill. The protective pipe caps on the AVK Series 36 PE-Tailed Gate Valve can be recycled. The only sacrificial packaging are the two plastic bags protecting the electrofusion couplers. That's a 71% reduction in landfill waste!

Ofwat is asking water companies to protect and enhance the environment. A gate valve solution that reduces waste to landfill by over 70% delivers a positive and sustainable contribution to achieving this objective.

63% reduction in stock keeping units (SKUs)

An AVK Series 36 PE-Tailed Gate Valve installation does not require nuts, bolts, washers, gaskets, flange adapters, PE Stub flanges or any kind of flange whatsoever. All you need for installation is the product and two electrofusion couplers. Compared to an equivalent flanged gate valve installation this amounts to a 63% reduction in stock keeping units leading to simpler procurement, leaner stockholdings, quicker stock picking and more efficient stock-to-site logistics.

These savings contribute to a more efficient, leaner and cost-effective operation.

AVK SERIES 36 PE-TAILED GATE VALVES

The patented valve to PE-tail connection

In the AVK Series 36 production process, the PE-tail pipe is pressed directly onto the grooved valve end. The grooves, combined with a sleeve around the valve/pipe connection, ensure the PE-tail pipe is firmly secured. The connection will remain tight and tensile across the entire service life of the pipeline.

The connection is further sealed with a shrink hose to provide additional corrosion protection.

The length of the PE-tail pipes

The length of the PE-tail pipes on the AVK Series 36 are long enough to accommodate an additional weld if required.

The AVK Series 36 is an AVK gate valve

Whilst the key feature of the AVK Series 36 PE-Tailed Gate Valve is the PE-tails, it is important to recognise that the gate valve itself is an outstanding piece of design engineering.

Here are some of the 'standard' features of the AVK Series 36:

- Fixed, integral wedge nut prevents corrosion caused by vibration
- Triple safety stem sealing
- Wedge and body guide rails ensure stable operation
- Thrust collar provides fixation of the stem and low free running torques
- AVK's wedge rubber has an excellent ability to regain its shape
- Bonnet gasket is fixed in recess and encircles bonnet bolts to prevent blow-out
- AVK's wedge rubber features an excellent bonding, minimum formation of biofilm and high resistance to water treatment chemicals
- Countersunk bonnet bolts sealed with hot melt to protect against corrosion
- Wedge shoes protect rubber against wear
- Full bore ensures low head loss and enables use of pipe cleaning devices
- Large stem hole in the wedge prevents stagnant water
- Low operating torques ensure easy operation
- Rolled threads increase the stem's strength
- Fusion bonded epoxy coating in compliance with DIN 3476 part 1 and EN 14901, GSK approved
- Anti-blowout stem design
- Wedge stop protects seals and coating

Datasheets, dimensions, downloads and more

To access all the support documents and data for the AVK Series 36 PE-Tailed Gate Valve range:

www.avkuk.co.uk/en-gb/product-finder/gate-valves/resilient-seated-gate-valves/36-89-002

www.avkuk.co.uk/en-gb/product-finder/gate-valves/resilient-seated-gate-valves/36-89-001

CREATE A SMARTER TOMORROW, TODAY

THE AVK SERIES 36 PE-TAILED GATE VALVE



**DISCOVER
AVK SMART WATER**



**PROTECT AND
ENHANCE THE
ENVIRONMENT**



**BUILD RESILIENT,
FUTURE-PROOF
PIPELINES**



**PROTECT CUSTOMER
INTERESTS TODAY
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**INVEST IN
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