Ke Kelit NZ

KELOX Multilayer Australasian Technical Specification

Contact:

Adam Lett
General Manager, Ke Kelit New Zealand

Rev 10: Feb 2016

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Contents

Reference Documents

This document should be read in conjunction with the following documents:

- Ke Kelit KELOX Technical Handbook
- Ke Kelit NZ Training Manual (most recent copy available upon request)

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Features and benefits

Pipe Material

KELOX Multilayer Pipe is manufactured from polyethylene of raised temperature resistance (PE-RT) inner and outer cores and bonded to a welded aluminum central core pipe – PE-RT/Alu/PE-RT. The inside and outside PE-RT layer to aluminium layer bonds are guaranteed by tight and stress resistant adhesive polymer.

This 5-layer composite pipe is halogen free, impermeable to oxygen and water vapour, as per AS 4176(EN/ISO 21003), tested, approved, audited regularly according to these standards, Watermark, DVGW and ÖVGW registered and certified.

Maximum pressure and temperature: 10 bar at 90°C; for a limited time acc. to EN ISO 21003-1 Table 1.

Features: extreme chemical resistance, high flexibility, low pressure loss and low expansion/contraction;

Colour: outside layer white, inside layer transparent.

- Available pipe diameters 16mm, 20mm, 25mm, 32mm, 40mm, 50mm, 63mm and 75mm.
- Evaluated to AS 4176 - 'Multilayer piping systems for hot & cold water plumbing applications'.
- Tested to AS/NZS 4020:2005 - 'Testing of products for use in contact with drinking water'.
- Evaluated to EN ISO 21003 series of standards - 'Multilayer piping systems for hot and cold water installations inside buildings'.
- Manufactured in accordance with ISO 9001:2008 - 'Quality Management Systems'.
- Manufactured in accordance with ISO14001:2004 – "Environmental Management System"

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Connection Types

KELOX PROtec Push-fit fittings

Proprietary push-fit joint pipe fittings, providing permanently sealed leak-tight joints. Manufactured from corrosion resistant DZR brass with a non–porous metal finish or PPSU plastic material. Axial pull-tight connection - 2 x nano coated, age resistant EPDM O-rings per connection. Transparent joint sleeves ensuring proper jointing. Integral protector-ring means that only calibrated and chamfered pipes can be jointed. Includes male and female threaded adaptor fittings. Suitable for surface-mounted pipe and embedded pipe applications. Sized to suit KELOX Multilayer Pipe 16mm, 20mm, 25mm and 32mm diameter pipes. Installed as a pipe jointing system to the KELOX Multilayer Pipe System in accordance with the manufacturer's requirements. Can be used in conjunction with KELOX-KM Press Fittings.

KELOX KM Press fittings

Proprietary, permanently sealed, press joint pipe fittings. Axial pulltight connection sealing at multiple points - 2 x age resistant EPDM O-rings per connection. Manufactured from corrosion resistant brass with a non –porous metal finish. Used with KELOX U-contour press jaws. Includes male and female threaded adaptor fittings. Suitable for surface-mounted pipe and embedded pipe applications. Sized to suit KELOX Multilayer Pipe 16mm, 20mm, 25mm, 32mm, 40mm, 50mm, 63mm and 75mm diameter pipes. Installed as a pipe jointing system to the KELOX Multilayer Pipe System in accordance with the manufacturer's requirements. Can be used in conjunction with KELOX PROtec push fittings.

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz

KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Specification

Table 1.1: Classification of service conditions for KELOX Multilayer Pipes

Application class	Design temperature T_D °C	Time [b] at T_D years	T_{max} °C	Time at T_{max} years	T_{mal} °C	Time at T_{mal} h	Typical field of application
1 [a]	60	49	80	1	95	100	Hot water supply (60 °C)
2 [a]	70	49	80	1	95	100	Hot water supply (70 °C)
4 [b]	20 plus cumulative 40 plus cumulative 60	2,5 20 25	70	2,5	100	100	Underfloor heating and low-temperature radiators
5 [b]	20 plus cumulative 60 plus cumulative 80	14 25 10	90	1	100	100	High-temperature radiators

[a] A country may select either class 1 or class 2 in conformity with its national regulations.

[b] Where more than one design temperature for time and associated temperature appears for any class, they should be aggregated. "Plus cumulative" in the table implies a temperature profile of the mentioned temperature over time (e.g. the design temperature profile for 50 years for class 5 is 20 °C for 14 years followed by 60 °C for 25 years, 80 °C for 10 years, 90 °C for 1 year and 100 °C for 100 h).

NOTE For values of T_D, T_{max} and T_{mal} in excess of those in the table, this International Standard does not apply.

Table 1.2

Applications	Temperature & Pressure	Size	Material	Jointing	Fittings
Chilled Water	-20° to 90°, 10 bar max	16mm - 75mm	PE-RT/Al/PE-RT manufactured to AS4176 (EN/ISO 21003), (KELOX by Ke Kelit)	Push & Press manufactured to AS4176 (EN/ISO 21003)	Threaded (EN10226-1), Couplings (ISO 228-1)
Heating Hot Water	-20° to 90°, 10 bar max	16mm - 75mm	PE-RT/Al/PE-RT manufactured to AS4176 (EN/ISO 21003), (KELOX by Ke Kelit)	Push & Press manufactured to AS4176 (EN/ISO 21003)	Threaded (EN10226-1), Couplings (ISO 228-1)
Domestic Potable Hot and Cold Water	70° (80° max), Operating Pressure: 10bar max	16mm - 75mm	PE-RT/Al/PE-RT manufactured to AS4176 (EN/ISO 21003), (KELOX by Ke Kelit)	Push & Press manufactured to AS4176 (EN/ISO 21003)	Threaded (EN10226-1), Couplings (ISO 228-1)

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Print & Identification

Pipe: marked with brand name (KELOX), relevant EN/ISO 21003 (AS4176) classes, selection of standards and approvals including Watermark Certification number (WMO22381), production batch references, meter reference, outside diameter and wall-thickness in mm (e.g. 25 x 2.5).
Fittings: KE KELIT logo, DZR mark on brass, outside diameter in mm (e.g. 25), selection of approvals. PROtec push fittings also carry Watermark Certification number (WMO22381).

Scope of Use

KELOX Multilayer Pipe System is designed for use in the following applications:

- Domestic and Commercial Hot and Cold Drinking Water systems up to 70°C – 10 bar (Class 2 as per AS4176/ENISO 21003) temperature max 80°C/1 year,
- Radiator System up to temperature max 90°C – 10 bar (Class 5 as per AS4176/ EN ISO 21003) according to relevant time/temperature profile given in EN ISO 21003-1 Table 1,
- Industrial applications limited to compressed air, inert gases and technical fluids (always consult with Ke Kelit for suitability and written pre-approval).

KELOX pipe is for internal use within the frame and structure of the building. The designer must correctly use the KELOX pipe diameter for its intended purpose and take into account the flow and pressure rate requirements (refer to KELOX Handbook).
Installation can only be carried out by a Registered Certifying Plumber or a Registered Licensed Plumber under the supervision of a Certifying Plumber as set out by the Plumbers Gasfitters and Drainlayers Act 2006. Installers are required to also hold a Ke Kelit Installation training card and Ke Kelit approved tools must only be used as outlined in the Ke Kelit training and KELOX Handbook.
Installations are to be carried out in accordance with Ke Kelit NZ Limited written instructions and documentation together with all national and local plumbing code regulations.
All warranties and Insurance is subject to adhering to Ke Kelit NZ Limited and the Manufacturers written documentation.

INNOVATIVE PIPE SYSTEMS
Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Limitations – KELOX Multilayer Pipe System

The KELOX Multilayer Pipe System is made from plastics and needs to be treated carefully to prevent shocks, impact and buckling, which could compromise the performance of the pipe or system.

Protect the pipes from long term UV light exposure from the sun, the usual time (6 months) required for storage and installation will have no effect on the material as it is UV stabilised but the material is not resistant to long term UV sun exposure greater than 90 days.

You must observe the installation guidelines for the screw press and push fittings (see the KELOX Handbook for installation guidelines)

- Important Notes! Always cut the pipe straight at a right angle to its axis. Use pipe cutters only for sizes less than diameter 25mm. For diameter 32mm and above use the wheel pipe cutter. Calibrate the pipe ends exactly. Push the fittings completely on the pipe without damaging the O-rings. Tighten the threads securely. Remember to press the press fittings to ensure there is a long term axial seal.
- Do NOT screw any tapered threaded pipes or any cast iron fittings into the female threads of the metal moulded fittings. Only join to faucets and components with straight threads. The threaded joint can be sealed by the usual methods (hemp, paste, Teflon tape) Do not over tighten the threads.

Observe the recommend pipe support spacing's, for details see the KELOX Handbook.

The expansion of KELOX pipes is clearly defined and must be accounted for in the design and installation of the system. No compensation for expansion is required for pipes installed in the wall. Refer to KELOX Handbook for details.

Never use heat or flame to bend the pipes. KELOX Multilayer pipes are easy to bend and do not spring back to their original shape.

- Ensure the pipes do not buckle.
- Do not install damaged or incorrectly jointed pipes.
- For bending to a narrow radius please use the spring coil or pipe bending tool.
- Avoid bending to a narrow radius immediately after joining the pipe with a screw or press fitting because this could damage the support sleeve.

Pressure testing of the KELOX Multilayer Pipe System must not exceed the performance set out by the manufacturer Ke Kelit NZ Documentation to local and government authority standards.

Water containing glycols for antifreeze is not a problem for the KELOX pipes; please observe the suppliers and manufacturers instructions.

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Operation at max. temperature Tmax (80°C respectively 90°C) is limited to 1 year at 10 bar depending on the application class. Higher temperatures over longer periods of time are not recommended. The failure temperature Tmax (95°C or 100°C) depending on the application class is limited to 100 hours at 10 bar.
The disinfection of the pipe system with chlorine dioxide or ozone in accordance with our guidelines is acceptable.

- Note: Excessive concentration or dosages can lead to premature ageing of the pipe system.

Domestic Hot and Cold water pipes penetrating concrete or masonry elements shall be protected from the likelihood of damage and either wrapped with a flexible material, or passed through a sleeve or duct, to permit free movement for expansion and contraction.
Testing should be carried out before concealing pipework behind interior linings, flooring or within concrete.
In order to qualify for the Guarantee cover each installation must use KELOX system parts only.
To install the KELOX Multilayer Pipe System correctly a minimal amount of expenditure is required for tools for your own security you must use and maintain the Ke Kelit tools.
For any use outside of this Technical Manual or the KELOX Handbook you must consult with a Ke Kelit agent or Ke Kelit NZ Limited on Phone/Email +64(04)5684870/info@kekelit.co.nz.
The design and suitability of the KELOX Multilayer Pipe System is limited by its performance. All users must take into account all written documentation within the Technical Handbook available from Ke Kelit NZ Limited and the manufacturer.

Installation

Installation is to only be done by a Registered Certifying Plumber or a Registered Licensed Plumber under the supervision of a Certifying Plumber as set out by the Plumbers Gasfitters and Drainlayers Act 2006.
Installers should also hold a Ke Kelit Installation training card and Ke Kelit approved tools only should be used as outlined in the Ke Kelit training.
Installations are to be carried out in accordance with the KELOX Multilayer Handbook, KELOX Training Documentation and all national and local plumbing regulations.
The initial pressure test needs always to be conducted according to local regulations. In New Zealand this is a static pressure test at 1500 kPa for no less than 30 Minutes, in accordance with AS/NZS 3500.1 section 16 and AS/NZS 3500.4 section 11. According to European

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

regulations this should be an initial test of 60 minutes and main test of 120 minutes, both at 10 bar (but Ke Kelit recommends both at 15 bar).

Warranty

Ke Kelit provides the following guarantee for the KELOX Multilayer Pipe System (provided the Ke Kelit installation instructions have been followed).

For a period of 10 years after the date of manufacture we guarantee cover

- For damages to the pipe systems which can be proven to be attributable to production or material defects.
- For damages to property or persons suffered by third parties as a result of defects in our product. Claims are subject to liability regulations
- For expenditure incurred by a third party for removing defective products and for installing defect free products supplied by Ke Kelit.
- Claims cannot be made for stoppages in production and loss of earnings, whether they are based on the points above or any other grounds.

The guarantee does not provide cover for defects that arise as a result of errors made during installation. Ke Kelit installation instructions must be followed at all times.

To provide further cover the manufacturer has taken out product liability insurance for the sum of

€1,000,000 for damages to property and persons

In addition to this, years 11 to 25 after the date of manufacture, Ke Kelit provides "parts only" cover for failure which can be proven to be attributable to production or material defects. This excludes installation costs and costs of damages.

Environmental Management System

The producer of the system (pipes & fittings), KE KELIT Kunststoffwerk GmbH, has fully implemented an Environmental Management system according to EN ISO14001:2004 and keeps it up to date and enforced.

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Quality Assurance

The producer of the system (pipes & fittings), KE KELIT Kunststoffwerk GmbH, has fully implemented a Quality Management system according to EN ISO 9001:2008 and keeps it up to date and enforced.

In order to achieve the quality targets set out in ISO 9001:2008, the following tests are carried out during the manufacturing process.

Internal testing in the Ke Kelit Laboratory.

- Raw material parameters
- Dimensions
- Quality of manufactured goods
- Bursting pressure
- Behaviour under heat conditions

Furthermore, the pipe and fittings have been evaluated according to ASNZS 4176 (EN ISO 21003) and tested by authorised external testing institutes. The following tests are performed as part of the ASNZS 4176 (EN ISO 21003) evaluation.

- System testing
- Internal pressure- resistance to creep
- Expansion testing
- Test for peeling the multilayer structure
- Hygienic and toxicological testing
- Impermeable to oxygen
- Testing of the joints:
- Under vacuum
- Under Tensile load
- Under the thermal cyclic test
- Under water hammer
- Under reverse bending

The KELOX Multilayer Pipe system has also been tested and evaluated to AS/NZS 4020:2005 Testing of products for use in contact with drinking water

KE KELIT®
INNOVATIVE PIPE SYSTEMS

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz

KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

New Zealand Building Code Compliance

KELOX Multilayer Pipe System can demonstrate compliance to the following NZBC Clauses:

<table>
<tr><td colspan="4">Kelox Multilayer Pipe System</td></tr>
<tr><td colspan="4">Description:
Kelox Multilayer Pipe System is a three layer, PE-RT/ALU/PE-RT, water pipe system ranging from 16mmØ to 63mmØ for use with brand matched brass PROtec push fittings for 16mmØ to 32mmØ and brass Kelox Ultra Press fittings for 16mmØ to 63mmØ</td></tr>
<tr><td>NZ Building Code Applicable Performance Clauses</td><td colspan="2">Manufacturing Standards Tests Applied</td><td>Limitations</td><td>Comments</td></tr>
<tr><td rowspan="2">B2.3.1 Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified intended life of the building, if stated, or:

(a) the life of the building, being not less than 50 years, if:
(ii) those building elements are difficult to access or replace, or
(iii) failure of those building elements to comply with the building code would go undetected during both normal use and maintenance of the building.</td><td>Original Manufacturing Standard (EN ISO 21003-1)</td><td>Additional Tests</td><td rowspan="2">Installation requirements limit maximum temperature to 70 degrees and pressure to 1000 kPa

Not exposed to UV for greater than 90 days</td><td rowspan="2">Following is taken from DOW chemical co report regarding PE-RT “Test times well above one year at 110 °C allows extrapolation of the pipes performance beyond 50 years at 70 °C, using the ISO 90809 extrapolation factors.’[1]

Manufacturing plant has ISO 9001 Accreditation[2]

AS 4176 is referenced as a compliant manufacturing standard via G12/VM1</td></tr>
<tr><td>TGM Test Report for EN ISO 21003-1 states material for pipes is made of PE-RT/Aluminium/PE-RT EN ISO 21003-1 has a requirement that it be tested to 2300 kPa at 110°C for > 1 year[3]</td><td>AS 4176.2 for pipe
AS 4176.3 for fittings</td></tr>
<tr><td>F2.3.1 The quantities of gas, liquid, radiation or solid particles emitted by materials used in the construction of buildings, shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the atmosphere of any space.</td><td></td><td>AS 4176.2 for pipe
AS 4176.3 for fittings</td><td></td><td>AS 4176 is referenced as a compliant manufacturing standard via G12/VM1
PE-RT and brass can claim a history of use in the built environment with no identified failures of consequence to F2.3.1</td></tr>
<tr><td>G10.3.1 Piping systems shall be constructed to avoid the likelihood of:
(a) significant leakage or damage during normal or reasonably foreseeable abnormal conditions,</td><td>EN ISO 21003-1 has a requirement that it be tested to 2300 kPa at 110°C for > 1 year
TGM Test Report refers to pressure strength tests carried out in accordance with ISO 17456
TGM Test Report tests for watertightness of pipe and fittings as a system[4]</td><td>AS 4176.2 for pipe
AS 4176.3 for fittings</td><td>Installation is limited to persons authorised under the Plumbers, Gasfitters & Drainlayers Act 2006 who have passes the Ke Kelit training course</td><td>Following is taken from DOW chemical co report regarding PE-RT “Test times well above one year at 110 °C allows extrapolation of the pipes performance beyond 50 years at 70 °C, using the ISO 90809 extrapolation factors.’

Manufacturing plant has ISO 9001 Accreditation</td></tr>
<tr><td>G12.3.2 A potable water supply system must be—
(c) installed using components that will not contaminate the water.</td><td>EN ISO 21003-1</td><td>WRc-NSF report tests to “AS/NZS 4020: 2005 Products for use with Potable Water”[5]</td><td></td><td>AS 4176 is referenced as a compliant manufacturing standard via G12/VM1</td></tr>
</table>

G12.3.7 *Water supply systems* must be installed in a manner that— (a) pipes water to sanitary fixtures and sanitary appliances flow rates that are adequate for the correct functioning of those fixtures and appliances under normal conditions; and (b) avoids the likelihood of leakage;	EN ISO 21003-1 has a requirement that it be tested to 2300 kPa at 110°C for > 1 year TGM Test Report refers to pressure strength tests carried out in accordance with ISO 17456 TGM Test Report tests for watertightness of pipe and fittings as a system	AS 4176.2 for pipe AS 4176.3 for fittings	Installation is limited to persons authorised under the Plumbers, Gasfitters & Drainlayers Act 2006 who have passes the Ke Kelit training course Installation handbook has pipe-sizing tables with use methodology taught on the training course.[6]	Following is taken from DOW chemical co report regarding PE-RT "Test times well above one year at 110 °C allows extrapolation of the pipes performance beyond 50 years at 70 °C, using the ISO 90809 extrapolation factors.' Manufacturing plant has ISO 9001 Accreditation AS 4176 is referenced as a compliant manufacturing standard via G12/VM1
H1.3.4 Systems for the heating, storage, or distribution of hot water to and from sanitary fixtures or sanitary appliances must, having regard to the energy source used,— (a) limit the energy lost in the heating process; and (b) be constructed to limit heat losses from storage vessels and from distribution systems; and (c) be constructed to facilitate the efficient use of hot water.			Volume of water in pipe lengths for compliance with H1. 0.0635L/m for 12mm, 0.113L/m for 16mm, 0.189L/m for 20mm, 0.314L/m for 25mm.[8] Pipe lengths which satisfy H1are 31.5m, 17.7m, 10.6m and 6.3m for 12mm, 16mm,20mm and 25mm respectively. Hot water pipes embedded in concrete of buried underground shall be thermally insulated and installed in a duct.[9]	H1/AS1 5.0 dictates that hot water systems complying with NZS4305 satisfy the requirements of NZBC H1.3.4. NZS4305 3.2.1 dictates maximum hot water volume in pipe runs to kitchen. This is satisfied provided the limitations indicated are satisfied. Kelox Pipe Insulation satisfies the requirements of NZS4305 3.8. All other aspects of NZS4305 are satisfied provided the installation is in accordance with NZS4305 and the KeKelit Technical Literature.[7]

[1] Page 7 Detlef Schramm, Mark Jeruzal Plastics R & D paper, available at, https://www.plasticpipe.org/pdf/pe_rt_new_class_polyethylene.pdf
[2] Manufacturer is Ke Keli Kuntststoffwerk GmbH, A-4020 Linz, Ignaz-Mayer-street 17, Austria
[3] Page 3 TGM test report VA KU 25093
[4] Page 5 TGM test report VA KU 25093
[5] Page 2 WRc-NSF Final Report Revision 3a, 15 07 11
[6] Pages 28-34 Kelox Handbook 2015
[7] Pages 26-35 Kelox Handbook 2015
[8] Pages 29 Kelox Handbook 2015
[9] NZS4305-1996 3.7

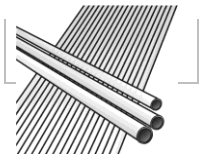
Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz

KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

KE KELIT®
INNOVATIVE PIPE SYSTEMS
Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

Component drawings and product codes

7021207	KMU100 KELOX multilayer pipe 12mmx1.5mm x 700m
7021602	KMU100 KELOX multilayer pipe 16mmx2mm x 200m
7022001	KMU100 KELOX multilayer pipe 20mmx2.25mm x 100m
7022500	KMU100 KELOX multilayer pipe 25mmx2.5mm x 50m
7023200	KMU100 KELOX multilayer pipe 32mmx3mm x 50m



7020160	KMU110 KELOX multilayer pipe 16mmx2mm x 5m
7020200	KMU110 KELOX multilayer pipe 20mmx2.25mm x 5m
7020250	KMU110 KELOX multilayer pipe 25mmx2.5mm x 5m
7020320	KMU110 KELOX multilayer pipe 32mmx3mm x 5m
7020400	KMU110 KELOX multilayer pipe 40mm x 4mm x 5m
7020500	KMU110 KELOX multilayer pipe 50mm x 4.5mm x 5m
7020630	KMU110 KELOX multilayer pipe 63mm x 6mm x 5m
7020750	KMU110 KELOX-multilayer pipe 75mm x 7.5mm x 5m

7021164	KMU134 KELOX Pipe 16mmx2mm x 50m Plus 4mm Insulation
7021204	KMU134 KELOX Pipe 20mmx2.25mm x50m Plus 4mm Insulation
7021254	KMU134 KELOX Pipe 25mmx2.5mm x 25m Plus 4mm Insulation
7021324	KMU134 KELOX Pipe 32mmx3mm x 25m Plus 4mm Insulation

7021161	KMU130 KELOX Pipe 16mmx2mm x 50 Puls 9mm Insulation
7021201	KMU130 KELOX Pipe 20mmx2.25mm x 50m Plus 9mm Insulation
7021251	KMU130 KELOX Pipe 25mmx2.5mm x 25m Plus 9mm Insulation
7021321	KMU130 KELOX Pipe 32mmx3mm x 25m Plus 9mm Insulation

70211613	KMU133 KELOX Pipe16mmx2mm x 50m Plus13mm Insulation
70212013	KMU133 KELOX Pipe 20mmx2.25mm x 50m Plus 13mm Insulation
70212513	KMU133 KELOX Pipe 25mmx2.5mm x 25m Plus 13mm Insulation
70213213	KMU133 KELOX Pipe 32mmx3mm x 25m Plus 13mm Insulation

73100BB0	KMP410 KELOX PROtec coupling 16mm/16mm
73100DB0	KMP410 KELOX PROtec coupling 20mm/16mm
73100DD0	KMP410 KELOX PROtec coupling 20mm/20mm
73100EB0	KMP410 KELOX PROtec coupling 25mm/16mm
73100ED0	KMP410 KELOX PROtec coupling 25mm/20mm
73100EE0	KMP410 KELOX PROtec coupling 25mm/25mm
73100FB0	KMP410 KELOX PROtec coupling 32mm/16mm
73100FD0	KMP410 KELOX PROtec coupling 32mm/20mm
73100FE0	KMP410 KELOX PROtec coupling 32mm/25mm
73100FF0	KMP410 KELOX PROtec coupling 32mm/32mm

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz

KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

73600BB0	KWP410 KELOX PROtec **PPSU** coupling 16mm/16mm
73600DB0	KWP410 KELOX PROtec **PPSU** coupling 20mm/16mm
73600DD0	KWP410 KELOX PROtec **PPSU** coupling 20mm/20mm
73600ED0	KWP410 KELOX PROtec **PPSU** coupling 25mm/20mm
73600EE0	KWP410 KELOX PROtec **PPSU** coupling 25mm/25mm

71100BB0	KMU410 KELOX coupling 16mm x 16mm
71100DB0	KMU410 KELOX coupling 20mm x 16mm
71100DD0	KMU410 KELOX coupling 20mm x 20mm
71100EB0	KMU410 KELOX coupling 25mm x 16mm
71100ED0	KMU410 KELOX coupling 25mm x 20mm
71100EE0	KMU410 KELOX coupling 25mm x 25mm
71100FE0	KMU410 KELOX coupling 32mm x 25mm
71100FF0	KMU410 KELOX coupling 32mm x 32mm
9471500	KM410 KELOX coupling 40mm x 25mm
9471600	KM410 KELOX coupling 40mm x 32mm
9471700	KM410 KELOX coupling 40mm x 40mm
9481600	KM410 KELOX coupling 50mm x 32mm
9481700	KM410 KELOX coupling 50mm x 40mm
9481800	KM410 KELOX coupling 50mm x 50mm
7943030	KM410 KELOX coupling 63mm x 40mm
7943020	KM410 KELOX coupling 63mm x 50mm
7943010	KM410 KELOX coupling 63mm x 63mm
7944030	KM410 KELOX coupling 75mm x 50mm
7944020	KM410 KELOX coupling 75mm x 63mm
7944010	KM410 KELOX coupling 75mm x 75mm

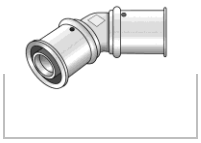
73103BB0	KMP420 KELOX PROtec elbow 90° 16mm
73103DD0	KMP420 KELOX PROtec elbow 90° 20mm
73103EE0	KMP420 KELOX PROtec elbow 90° 25mm
73103FF0	KMP420 KELOX PROtec elbow 90° 32mm

73603BB0	KWP420 KELOX PROtec **PPSU** elbow 90° 16mm
73603DD0	KWP420 KELOX PROtec **PPSU** elbow 90° 20mm
73603EE0	KWP420 KELOX PROtec **PPSU** elbow 90° 25mm

71103BB0	KMU420 KELOX elbow 90° 16mm
71103DD0	KMU420 KELOX elbow 90° 20mm
71103EE0	KMU420 KELOX elbow 90° 25mm
71103FF0	KMU420 KELOX elbow 90° 32mm
9171700	KM420 KELOX elbow 90° 40mm
9181800	KM420 KELOX elbow 90° 50mm
7913010	KM420 KELOX elbow 90° 63mm
7914010	KM420 KELOX elbow 90° 75mm

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

73106EE0	KMP425 KELOX PROtec elbow 45° 25mm
73106FF0	KMP425 KELOX PROtec elbow 45° 32mm

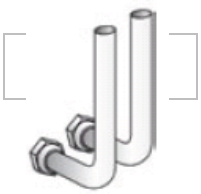


71106FF0	KMU425 KELOX elbow 45° 32mm
9271700	KM425 KELOX elbow 45° 40mm
9281800	KM425 KELOX elbow 45° 50mm
7923010	KM425 KELOX elbow 45° 63mm
7924010	KM425 KELOX elbow 45° 75mm

73150B02	KMP430 KELOX PROtec radiator elbow 90° 16mm/330mm

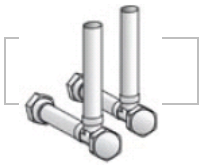
73153BB2	KMP432 KELOX PROtec radiator tee 16mm/330mm
73153DD2	KMP432 KELOX PROtec radiator tee 20mm/330mm

9825220	KM435 KELOX connection to skirting board 16x1/2"x16
9825240	KM435 KELOX connection to skirting board 16x1/2"xST
9825200	KM435 KELOX connection to skirting board STx1/2"x16
9845220	KM435 KELOX connection to skirting board 16x1/2"x20
9845240	KM435 KELOX connection to skirting board 20x1/2"x16
9845250	KM435 KELOX connection to skirting board 20x1/2"x20
9845270	KM435 KELOX connection to skirting board 20x1/2"x25
9845290	KM435 KELOX connection to skirting board 25x1/2"x20
9805220	KM435 KELOX connection to skirting board 25x1/2"x25



7701610	KM437 KELOX elbow connection to skirting board

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010



7701620	KM438 elbow connection with shut-off function

73110BBB	KMP440 KELOX PROtec tee 16mm/16mm/16mm
73110BDB	KMP440 KELOX PROtec tee 16mm/20mm/16mm
73110DBB	KMP440 KELOX PROtec tee 20mm/16mm/16mm
73110DBD	KMP440 KELOX PROtec tee 20mm/16mm/20mm
73110DDB	KMP440 KELOX PROtec tee 20mm/20mm/16mm
73110DDD	KMP440 KELOX PROtec tee 20mm/20mm/20mm
73110EBB	KMP440 KELOX PROtec tee 25mm/16mm/16mm
73110EBD	KMP440 KELOX PROtec tee 25mm/16mm/20mm
73110EBE	KMP440 KELOX PROtec tee 25mm/16mm/25mm
73110EDD	KMP440 KELOX PROtec tee 25mm/20mm/20mm
73110EDE	KMP440 KELOX PROtec tee 25mm/20mm/25mm
73110EEE	KMP440 KELOX PROtec tee 25mm/25mm/25mm
73110FBF	KMP440 KELOX PROtec tee 32mm/16mm/32mm
73110FDF	KMP440 KELOX PROtec tee 32mm/20mm/32mm
73110FEE	KMP440 KELOX PROtec tee 32mm/25mm/25mm
73110FEF	KMP440 KELOX PROtec tee 32mm/25mm/32mm
73110FFF	KMP440 KELOX PROtec tee 32mm/32mm/32mm

73610BBB	KWP440 KELOX PROtec **PPSU** tee 16mm/16mm/16mm
73610DBB	KWP440 KELOX PROtec **PPSU** tee 20mm/16mm/16mm
73610DBD	KWP440 KELOX PROtec **PPSU** tee 20mm/16mm/20mm
73610DDD	KWP440 KELOX PROtec **PPSU** tee 20mm/20mm/20mm
73610EBE	KWP440 KELOX PROtec **PPSU** tee 25mm/16mm/25mm
73610EDD	KWP440 KELOX PROtec **PPSU** tee 25mm/20mm/20mm
73610EDE	KWP440 KELOX PROtec **PPSU** tee 25mm/20mm/25mm
73610EEE	KWP440 KELOX PROtec **PPSU** tee 25mm/25mm/25mm

71110BBB	KMU440 KELOX tee 16mm x 16mm x 16mm
71110BDB	KMU440 KELOX tee 16mm x 20mm x 16mm
71110DBB	KMU440 KELOX tee 20mm x 16mm x 16mm
71110DBD	KMU440 KELOX tee 20mm x 16mm x 20mm
71110DDB	KMU440 KELOX tee 20mm x 20mm x 16mm
71110DDD	KMU440 KELOX tee 20mm x 20mm x 20mm
71110EBB	KMU440 KELOX tee 25mm x 16mm x 16mm
71110EBD	KMU440 KELOX tee 25mm x 16mm x 20mm
71110EBE	KMU440 KELOX tee 25mm x 16mm x 25mm
71110EDD	KMU440 KELOX tee 25mm x 20mm x 20mm
71110EDE	KMU440 KELOX tee 25mm x 20mm x 25mm
71110EEE	KMU440 KELOX tee 25mm x 25mm x 25mm
71110FBF	KMU440 KELOX tee 32mm x 16mm x 32mm
71110FDF	KMU440 KELOX tee 32mm x 20mm x 32mm

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

71110FEE	KMU440 KELOX tee 32mm x 25mm x 25mm
71110FEF	KMU440 KELOX tee 32mm x 25mm x 32mm
71110FFF	KMU440 KELOX tee 32mm x 32mm x 32mm
9371470	KM440 KELOX tee 40mm x 20mm x 40mm
9371570	KM440 KELOX tee 40mm x 25mm x 40mm
9371660	KM440 KELOX tee 40mm x 32mm x 32mm
9371670	KM440 KELOX tee 40mm x 32mm x 40mm
9371770	KM440 KELOX tee 40mm x 40mm x 40mm
9381580	KM440 KELOX tee 50mm x 25mm x 50mm
9381680	KM440 KELOX tee 50mm x 32mm x 50mm
9381880	KM440 KELOX tee 50mm x 50mm x 50mm
7933030	KM440 KELOX tee 63mm x 40mm x 63mm
7933010	KM440 KELOX tee 63mm x 63mm x 63mm
7934030	KM440 KELOX tee 75mm x 40mm x 75mm
7934010	KM440 KELOX tee 75mm x 75mm x 75mm

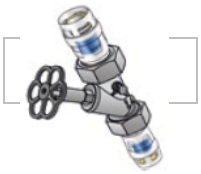
73240B02	KMP447 KELOX PROtec Tee female thread 16mmx1/2"
73240D02	KMP447 KELOX PROtec Tee female thread 20mmx1/2"
73240E02	KMP447 KELOX PROtec Tee female thread 25mmx1/2"
73240E04	KMP447 KELOX PROtec Tee female thread 25mmx3/4"
73240F02	KMP447 KELOX PROtec Tee female thread 32mmx1/2"
73240F04	KMP447 KELOX PROtec Tee female thread 32x3/4"

71240B02	KMU447 KELOX Tee female thread 16mm x 1/2"
71240D02	KMU447 KELOX Tee female thread 20mm x 1/2"
71240E02	KMU447 KELOX Tee female thread 25mm x 1/2"
71240E04	KMU447 KELOX Tee female thread 25mm x 3/4"
71240F04	KMU447 KELOX Tee female thread 32mm x 3/4"
9373380	KM447 KELOX Tee female thread 40mm x 1"
9383480	KM447 KELOX Tee female thread 50mm x 1"
7933330	KM447 KELOX Tee female thread 63mm x 1"
7934040	KM447 KELOX Tee female thread 75mm x 1"

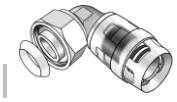
73202B02	KMP450 KELOX PROtec adaptor male 16mmx1/2"
73202D02	KMP450 KELOX PROtec adaptor male 20mmx1/2"
73202D04	KMP450 KELOX PROtec adaptor male 20mmx3/4"
73202E04	KMP450 KELOX PROtec adaptor male 25mmx3/4"
73202E05	KMP450 KELOX PROtec adaptor male 25mmx1"
73202F02	KMP450 KELOX PROtec adaptor male 32mmx1/2"
73202F04	KMP450 KELOX PROtec adaptor male 32mmx3/4"
73202F05	KMP450 KELOX PROtec adaptor male 32mmx1"

Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010

71202B02	KMU450 KELOX adaptor male 16mm x 1/2"
71202D02	KMU450 KELOX adaptor male 20mm x 1/2"
71202D04	KMU450 KELOX adaptor male 20mm x 3/4"
71202E04	KMU450 KELOX adaptor male 25mm x 3/4"
71202E05	KMU450 KELOX adaptor male 25mm x 1"
71202F05	KMU450 KELOX adaptor male 32mm x 1"
9072500	KM450 KELOX adaptor male 40mm x 1 1/4"
9082600	KM450 KELOX adaptor male 50mm x 1 1/2"
7903010	KM450 KELOX adaptor male 63mm x 2"
7904010	KM450 KELOX adaptor male 75mm x 2 1/2"

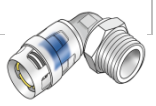


73233BB0	KMP452 KELOX slanted seat valve with KMP455 16-DN15
73233DD0	KMP452 KELOX slanted seat valve with KMP455 20-DN15
73233EE0	KMP452 KELOX slanted seat valve with KMP455 25-DN20
73233FF0	KMP452 KELOX slanted seat valve with KMP455 32-DN25



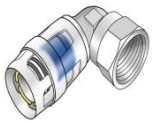
73203B02	KMP455 KELOX PROtec union with female thread 16mmx1/2"
73203B04	KMP455 KELOX PROtec union with female thread 16mmx3/4"
73203D04	KMP455 KELOX PROtec union with female thread 20mmx3/4"
73203E05	KMP455 KELOX PROtec union with female thread 25mmx1"
73203F06	KMP455 KELOX PROtec union with female thread 32mmx5/4"
73204B02	KMP455K KELOX PROtec union female thread conical seal 16mmx1/2"
73204D04	KMP455K KELOX PROtec union female thread conical seal 20mmx3/4"
73204E04	KMP455K KELOX PROtec union female thread conical seal 25mmx3/4"
73204F04	KMP455K KELOX PROtec union female thread conical seal 32mmx3/4"
73207B02	KMP456K KELOX union elbow female thread conical seal 16mmx1/2"

73206B02	KMP457 KELOX PROtec adaptor female 16mmx1/2"
73206D02	KMP457 KELOX PROtec adaptor female 20mmx1/2"
73206D04	KMP457 KELOX PROtec adaptor female 20mmx3/4"
73206E04	KMP457 KELOX PROtec adaptor female 25mmx3/4"
73206E05	KMP457 KELOX PROtec adaptor female 25mmx1"
73206F05	KMP457 KELOX PROtec adaptor female 32mmx1"



73212B02	KMP460 KELOX PROtec elbow adaptor 90° male 16mmx1/2"
73212D02	KMP460 KELOX PROtec elbow adaptor 90° male 20x1/2"
73212D04	KMP460 KELOX PROtec elbow adaptor 90° male 20x3/4"
73212E04	KMP460 KELOX PROtec elbow adaptor 90° male 25mmx3/4"
73212F05	KMP460 KELOX PROtec elbow adaptor 90° male 32mmx1"
73216B02	KMP467 KELOX PROtec elbow adaptor 90° female 16mmx1/2"

KE KELIT®
INNOVATIVE PIPE SYSTEMS
Phone +64 (04) 568 4870 **Fax** +64 (04) 568 9870 **e-mail** info@kekelit.co.nz
KE KELIT New Zealand Limited Level 1, 1 Margaret Street, Lower Hutt 5010



73216D02	KMP467 KELOX PROtec elbow adaptor 90° female 20mmx1/2"
73216D04	KMP467 KELOX PROtec elbow adaptor 90° female 20mmx3/4"
73216E04	KMP467 KELOX PROtec elbow adaptor 90° female 25mmx3/4"
73216F05	KMP467 KELOX PROtec elbow adaptor 90° female 32x1"

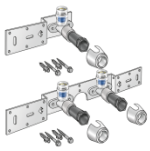
71120B00	KMU471 KELOX ULTRAX end cap 16mm
71120D00	KMU471 KELOX ULTRAX end cap 20mm

73250B02	KMP480 KELOX PROtec wall bracket 90° female 16mmx1/2"
73250D02	KMP480 KELOX PROtec wall bracket 90° female 20mmx1/2"
73250D04	KMP480 KELOX PROtec wall bracket 90° female 20mmx3/4"
73250E04	KMP480 KELOX PROtec wall bracket 90° female 25mmx3/4"

73254B2B	KMP477 KELOX PROtec double wall bracket female 16mmx1/2"x16mm
73254D2D	KMP477 KELOX PROtec double wall bracket female 20mmx1/2"x20mm

73256B02	KMP481 KELOX PROtec male wingback 16mmx1/2"x50mm
73256D02	KMP481 KELOX PROtec male wingback 20mmx1/2"x50mm

73272BB0	KMP489 KELOX PROtec STEELFIX adaptor 16mm x 15mm
73272CD0	KMP489 KELOX PROtec STEELFIX adaptor 20mm x 18mm
73272DE0	KMP489 KELOX PROtec STEELFIX adaptor 25mm x 22mm
73272EF0	KMP489 KELOX PROtec STEELFIX adaptor 32mm x 28mm



73261B02	KMP485 KELOX PROtec connection set 16mmx1/2" Single Connection
73262B02	KMP485 KELOX PROtec connection set 16mmx1/2" 8-10cm
73266B02	KMP485 KELOX PROtec connection set 16mmx1/2" 15cm
73261D02	KMP485 KELOX PROtec connection set 20mmx1/2" Single Connection
73262D02	KMP485 KELOX PROtec connection set 20x1/2" 8-10cm
73266D02	KMP485 KELOX PROtec connection set 20mmx1/2" 15cm

73264B02	KMP485SB KELOX PROtec connection set with elbow 16mmx1/2" 8-10cm
73268B02	KMP485SB KELOX PROtec connection set with elbow 16mmx1/2" 15cm
73264D02	KMP485SB KELOX PROtec connection set with elbow 20mmx1/2" 8-10cm
73268D02	KMP485SB KELOX PROtec connection set with elbow 20mmx1/2" 15cm

KE KELIT New Zealand Limited
Level 1, 1 Margaret Street, Lower Hutt 5010

Phone +64 (04) 568 4870
Fax +64 (04) 568 9870
e-mail info@kekelit.co.nz

www.kekelit.co.nz