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**1225 RIVERSIDE DRIVE WEST
WINDSOR, ONTARIO
ESCC No. 122**

**KITEC® PIPING
INVESTIGATION REPORT**

MAY 07, 2019 – REV01

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INTRODUCTION

Trace Consulting Group Ltd. was retained by M.F Arnsby Property Management Ltd., Agents for and on behalf of ESCC # 122 to review the domestic water system at 1225 Riverside Drive West, Windsor, in order to determine whether Kitec® piping and fittings are installed in the building.

Essex Standard Condominium Corporation No. 122, is a fourteen (14) storey high-rise building with a two (2) storey underground parking garage. It has a total of one hundred and twenty three (123) residential suites. The building is approximately thirteen (13) years old. Amenities include a party room, games room, exercise room and swimming pool area.

A site visit was made on April 8, 2019 to examine the domestic cold and hot water piping systems in this building, including in-suite distribution piping.

All comments in this report have been made from a visual review as well as available information and comments from building staff, with no destructive examination of the piping system. No calculations were performed. Recommendations are our opinion.

OBSERVATIONS

Based on our observations, the domestic water system consists of three zones. All three zones are supplied from the building's water entry via copper risers, which connect to copper domestic cold water supply manifolds located in the corridor ceiling space on every floor. The domestic cold water risers were insulated with fiberglass insulation; the manifolds were not insulated.

Each manifold supplies a series of ¾" connections, one per suite, which are equipped with ¾" ball type isolation valves. Each branch line transitions to Kitec® immediately downstream of the header, and the ¾" Kitec® line runs into each suite on that floor. Within each suite, the ¾" Kitec® piping connects via a ¼ turn Dahl suite isolation valve to ¾" lines serving the suite's dedicated electric hot water heater and a 1" copper cold water manifold. A ¾" domestic hot water Kitec® pipe runs from the tank to a 1" copper hot water manifold. ½" Kitec® distribution piping runs from each manifold through gypsum board walls and suspended ceilings, branching off to serve various plumbing fixtures.

Kitec® piping run-outs generally connect directly to the isolation valve for each fixture, but in certain cases transition to copper a short distance upstream of the fixture.

With regard to the building's common elements, Kitec® piping were observed serving the janitor's sink on the ground floor, the trap seal primer lines from the trap priming manifold located in the basement bicycle room which serve the floor drains in the parking garage, and a hose bibb in the garbage room. Kitec piping was also observed to run within the generator room to other fixtures. Destructive examination of concealed piping within the change rooms and the party room to



identify and replace any Kitec® piping should be completed during the construction phase of the Kitec® replacement project.

The flexible plastic distribution piping was identified as Kitec® due to the markings “XPA”, “IPEX PE-AL-PE”, “IPEX PEX-AL-PEX”, “Plumbetter XPA”, “KITEC”, “B137.9”, and/or “B137.10” on the piping and “Kitec”, “CSA B137.9/10” and “ASTM F1974” on the fittings. Refer to Table 1 for images of the piping distribution system in the suites and common areas of the building.

Table 1 : Photographs



Figure 1: Typical DCW header within ceiling space in corridor.



Figure 2: Typical DCW & DHW manifolds and distribution piping within residential suite



Figure 3: Kitec® piping serving trap priming manifold and Kitec® trap priming lines.

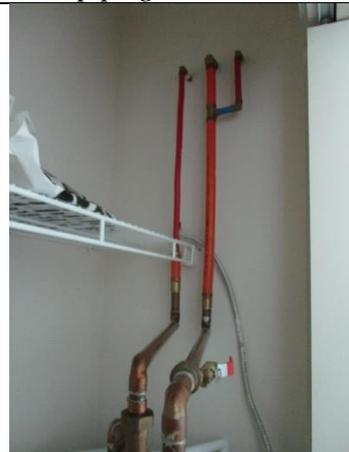


Figure 4: Kitec® piping connecting to hot water tank serving amenity spaces on roof level.



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Figure 5: Suite 106 – Kitec® DCW line connecting to in-suite isolation valve.



Figure 6: Suite 901: Kitec fitting within DHW distribution piping.

DISCUSSION

Kitec® is a plumbing system manufactured by IPEX™ Canada. It is composed of brass fittings and a flexible layered pipe consisting of aluminium tubing that is permanently bonded between layers of crosslinked polyethylene (PEX). The Kitec® system was originally advertised as an inexpensive and corrosion- and erosion-resistant alternative, and its flexible construction and light weight also increased the ease of installation as compared to rigid piping systems such as copper. Kitec® pipes were installed for domestic water and hydronic applications in many low and high rise residential buildings, as well as for some commercial and industrial uses. It became a popular alternative to copper in the mid-1990s, and was sold and installed in Canada until it was discontinued around 2007 after a North American class action lawsuit.

Brass plumbing fittings for potable water applications are normally made from so-called DZR (dezincification resistant) brass alloys which contain less than 15% zinc. This is because yellow (Cu-Zn) brasses which contain higher levels of zinc may be subject to a process called dezincification, wherein the chemistry of the normal municipal water supply leaches zinc from the brass, leaving behind a weakened, spongy copper layer at the water contact surface. As the deterioration progresses, mechanical failure occurs by straight forward fracture or increased vulnerability to stress corrosion cracking. This results in leaks, possible flow blockages, even catastrophic failure of the affected parts. Plumbing fittings that are resistant to dezincification are appropriately marked with the letters "CR" (corrosion resistant) or "DZR" (dezincification resistant). We did not observe this marking on the fittings on site.

The problems with the Kitec® system are twofold. The brass fittings have a high zinc content and are subject to premature failure due the dezincification process described above. The layered



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polyethylene-aluminum piping itself is also considered to be defective as it is subject to increasing risk of rupture over time, particularly when exposed to hot chlorinated water.

It is difficult to estimate the lifespan of Kitec® system components. The severity and rate of stress corrosion cracking can vary significantly from piece to piece in the brass fittings. Manufacturer IPEX™ Canada also notes that varying levels of corrosive contaminants exist in the municipal water supply affect the rate of the dezincification process affecting the brass fittings. The contaminants arise from air pollution, acidity from rainwater, and by-products from waste treatment and power plants. IPEX™ Canada further states that there is no consistent lifespan range for the Kitec® system components, nor ways of predicting failure based on visual examination.

The class action lawsuit settlement website notes that signs of imminent failure are sometimes but not always present. On Kitec® fittings a build-up of white zinc oxide residue on the outside of the fitting may be observed, and for Kitec® piping a darkening and/or bulging of the pipe. While we did not observe either of these conditions on site, in our experience with similar buildings, first failures tend to occur around the 8 to 10-year mark and increase in frequency thereafter.

In condominiums, Kitec® was used for water distribution within each unit, but not usually for the common main and riser piping. Kitec® piping and fittings are both considered to be at risk of premature failure, and it is anticipated that these failure rates will increase over time. In a multi-unit building, the damage resulting from flooding in one unit is likely to affect nearby units. This risk is now considered so severe that the presence of Kitec® is considered a “material fact” that must be declared on a building’s status certificate or disclosure statement.

RECOMMENDATIONS

Failures of the Kitec® system are different than those experienced with copper piping. When a copper piping system is approaching the end of its lifespan, failures usually occur in the form of “pin hole” leaks which are easily managed and do not typically result in major flooding. In our experience, unlike copper piping, Kitec® components can without any visual indication or prior warning, either by a longitudinal split in the piping or failures which result in separation of the fitting from piping. In both cases, the result is high volume flooding affecting surrounding units and significant insurance claims.

The City of Windsor requires a plumbing permit to replace the domestic water piping system inside a residential suite. Stamped Engineering drawings and an Engineer’s Commitment to Review are required for this. Trace Consulting Group Ltd. can assist in providing drawings and specifications for the scope of the replacement work for use in obtaining a permit, not only to obtain a permit, but also to tender the project in order to obtain competitive bids from selected and pre-qualified contractors.



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Based on the information above, and on the age of the Kitec® piping system, we recommend replacement of the Kitec® pipe and fittings throughout the building as soon as practicable, via a coordinated program, for domestic water distribution systems of both common elements and inside each residential suite.

▪ **Option 1 : Replace Kitec® with Uponor® AquaPEX® tubing system**

Although Kitec® piping also uses PEX in its construction, the Uponor® product is not to be confused with the existing defective PEX-AL-PEX piping produced by IPEX.

Uponor® AquaPEX® is a crosslinked polyethylene tubing system which is classified within the industry as PEX-a piping. PEX-a is produced by the peroxide (Engel) method, a manufacturing process where polyethylene is crosslinked in its amorphous state (above the crystalline melting point). Because of this, the degree of crosslinking reaches around 85%, resulting in a more uniform product with no weak links in the molecular chain, properties which make it the most durable and flexible PEX on the market.

The high degree of crosslinking gives PEX-a shape memory, which causes PEX-a tubing to shrink back to normal size after it is expanded. This property is leveraged to creating strong and durable cold expansion fitting connections using the ASTM F1960 standard. PEX-a tubing also has thermal memory, which allows kinked tubing to be restored to shape using a heat gun.

These properties result in a reliable and easy to install piping system that can be fished through holes, operates across a wide range of temperatures and pressures, and is backed by Uponor®'s 25 year warranty against material defects, up to 2 million dollars per incident. This option minimizes capital costs, as the tubing is less expensive, and the cutting and patching of finishes required is less than for rigid piping such as copper. Uponor also does not require insulation.

▪ **Option 2 : Replace Kitec® with Type "L" Copper piping**

Some clients prefer to take a more conservative approach to the replacement of their in-suite piping, and request that copper pipe and fittings be used for the replacement of the Kitec® system. Although copper piping was the industry standard for domestic water systems for many years, it does have greater material and installation costs, and a higher risk of failure of the soldered joints as compared to the cold expansion fittings with PEX reinforcing rings used in the Uponor® system.



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COST ESTIMATE

All figures stated exclude HST, permits, engineering fees, security, and removal and reinstatement of finishes. The latter may substantially increase costs in units such as the penthouse suites where there are special architectural finishes. These values are based on pre-estimation only. We recommend a full tender process to obtain exact and competitive pricing for this job.

- **Option 1 : Replace Kitec® with Uponor® AquaPEX® tubing system**

Budget pricing for replacement of the in-suite piping of typical suites with Uponor® AquaPEX® tubing and fittings by a certified plumbing contractor is as follows :

Table 2 : Estimated Labour & Material Cost to Install Uponor® AquaPEX® in Typical Suites

Suite type	Estimated cost
Bathroom, Laundry	\$4,500 - \$5,500
2 Bathrooms, Laundry	\$5,500 - \$6,500
2-storey Loft Suite	\$8,500 - \$10,000

Budget pricing for Kitec piping replacement with Uponor AquaPEX piping within all common elements, including but not limited Kitec piping serving each suite from the manifold located in the corridor to the suite isolation valves is approximately \$130,000 - \$150,000.

Budget pricing provided above have been inflated when compared to GTA prices. Budget pricing also do not include any costs associated with contractor accommodation/relocation. Eventual costs will highly depend on contractor scheduling and appetite at time of tender.

- **Option 2 : Replace Kitec® with Type “L” Copper piping**

It is difficult to provide precise budget pricing for replacement of in-suite piping with copper because there are many variables involved in the installation and it is relatively rare in recent years because of the increasing popularity of flexible piping systems. That said, where piping is generally accessible behind gypsum board finishes, as is the case in this building, cost to supply and install type “L” copper piping is roughly a 35-40% premium on the cost of Uponor® AquaPEX®.



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Suite owners may be able to recover some of the cost of replacing the piping in their suite by making a claim against the class action lawsuit mentioned above. We have attached, as Appendix 1, some frequently asked questions and responses found on Kitec® settlement website which may be a useful reference.



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We trust the above is satisfactory. Should you have further questions please do not hesitate to contact the undersigned.

Yours truly,

TRACE CONSULTING GROUP LTD.

Report by:

A handwritten signature in cursive script, appearing to read 'Kaezad Wania'.

Kaezad Wania
Mechanical E.I.T

Reviewed by:

A handwritten signature in cursive script, appearing to read 'Sam Soltani'.

Sam Soltani, P.Eng, LEED® AP
President



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LIMITATIONS

- This report reflects our best professional assessment and opinion based on our visual inspection of the above property only. There is no expressed or implied warranty or a compliance with past or present regulations.
- This report is only for the Mechanical systems and does not reflect on any other systems, structures or items other than those described in the report.
- This report is meant to be used in its entirety. Any use by a third party, or any reliance on or decisions to be made based on this letter, is the responsibility of said third party.
- This report does not eliminate uncertainties regarding the potential costs for the present and in the future.
- No destructive examination or physical testing has been performed.
- No design calculations have been performed.
- Trace Consulting Group does not accept any responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will not exceed our fees paid for professional services.
- This site report is valid only for that work which was specifically requested and is subject to review should additional information become available.
- Trace Consulting is not responsible for any views or opinions expressed by employees performing the site review.
- Trace Consulting will not be responsible for deviation within the normal limits of accuracy in accordance with standard practices.



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APPENDIX 1

KITEC® CLASS ACTION LAWSUIT SETTLEMENT FREQUENTLY ASKED QUESTIONS AND ANSWERS



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1. What is this class action settlement about?

The Settlement creates a one hundred and twenty five million U.S. dollar (US\$125,000,000) Settlement Fund (less attorneys' fees and costs set forth below) to be used for the benefit of the Class to pay for the repair of buildings, residences, homes or other structures plumbed with the Kitec System. Any money paid from the Settlement Fund to members of the Settlement Classes will be paid in the class member's local currency. The [Plan Of Allocation](#) describes the amounts and conditions of the benefits to the Class. **NOTE: To be eligible to receive any money from the Settlement Fund, you must complete and submit the Claim Form accompanying the Notice available on the [Case Documents](#) page. The claim filing deadline is January 9, 2020.** After the Claims Deadline, any funds remaining in the Settlement Fund after all payments to those Class Members filing proper Claim Forms, will be returned to the IPEX Funding Entities. Claims made after the Claims Deadline will be rejected.

APPLYING FOR PAYMENT UNDER THE SETTLEMENT

(Questions 2 - 12)

2. How do I apply for payment under the settlement (i.e. file a claim)?

To apply for payment under the settlement, you must submit a properly completed and timely Claim Form. Claim Forms are available at the following link: [Claim Form](#) or you can fill out the "Request Notice Packet" section on the top right of any page.

Please navigate to "Completing the Claim Form" at the top of the page for more information.

3. Who should file a claim?

Claims may only be filed by eligible persons defined as: all persons that own, have owned, lease, or have leased, and all those who have or may pursue claims through or in the name or right of them, buildings, homes, residences or any other structures in the United States (excluding the Clark County, NV class) and Canada that contain, or at any time contained, the Kitec System.

Excluded from the Settlement are all Persons who properly executed and timely submitted an Opt Out Form.

Clark County, NV properties are excluded because they are included in a separate class action suit. To find out more information regarding the Clark County settlement, please visit www.plumbingdefect.com.



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5. What is the deadline for filing a claim?

The claims filing deadline is January 9th, 2020 which is 8 years from the effective date of the settlement.

6. The Claim Form asks me to send in a piece of pipe. What if I don't have one?

If you are unable to provide a sample, you can still send in a claim form but you should state the reason for why you cannot do so on your claim form and that will be considered with your claim. You should also send documentation showing proof of installation, repairs, or replacement of your Kitec pipe or fittings.

7. I haven't experienced a leak. Should I still file a claim?

Yes. If you have not experienced a leak, you should still file a Claim Form. If there are sufficient funds remaining at the end of the claims filing period, you might be eligible for some compensation. How the funds are distributed at the end of the claims filing period depends on the sufficiency of the funds but will most likely be on a pro rata basis to all those who filed a valid claim.

If after you have filed a Claim Form, you experience a leak, you should file a second Claim Form with information regarding the leak and any related repair or replacement expenses.

8. I did the repairs myself. Should I still file a claim?

Yes. Even if you completed the repairs and/or replacement of the system yourself, you can claim under the settlement. Documentation still needs to be provided for the repair/replacement, as well as proof that you had KITEC pipes or fittings before installation of a new system.

9. Can a city file a claim with respect to municipal buildings that aren't privately owned?

Yes, cities can file claim with respect to municipal buildings that are not privately owned.



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10. Can an insurer or other person with a subrogated claim file a claim under the settlement?

Yes, insurers or other persons with subrogated claims can file a claim under the settlement. The insurer or other persons with subrogated claims must specify the property with respect to which the claim applies and provide documentation establishing that it can file a claim in respect of that property.

11. I've already filed a Claim Form, but I experienced another leak in my Kitec System. What should I do?

You should file another Claim Form and indicate on page 3 of the Claim Form that you have previously filed a claim. You should attach the relevant documentation in respect of the new leak only.

12. Is there a limit to how far back a claim can refer to?

No, you should file a claim with respect to any leaks experienced with respect to your Kitec pipe or fittings.

SETTLEMENT BENEFITS

(Questions 13 - 14)

13. What payments will I receive under the settlement?

Per the plan of allocation, a payment will occur per each qualified leak experienced. The payment is approximately one half of the estimated costs to repair or replace the affected fitting or pipe. Payment amounts will be based on how the KITEC pipes/fittings were installed. On your Claim Form you will need to specify whether the pipes are:

1. Open and accessible
2. Located behind drywall
3. Installed in concrete

For additional information please visit navigate to ["Case Documents"](#) at the top of the page and read the ["Plan Of Allocation"](#).



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Depending on the volume of claims and fund sufficiency the amount of the initial payment might be increased before the end of the claims period. If this happens and you have already filed a claim, you will receive a supplemental payment.

At the end of the claims period, assuming there are funds remaining, you will receive a supplemental payment. Depending on fund sufficiency the supplemental payment might include your full costs of repairing or replacing the affected fittings or pipe and the costs of a complete replumb. It is therefore important that you provide complete information with your Claim Form.

14. I sold a house with KITEC pipes/fittings and was required (by insurance, inspector, etc.) to replace with another system. Can I be reimbursed, even though a leak never occurred?

You should file a Claim Form and include documentation showing that you were required to replace your Kitec System and the costs of the replumb.

Depending on fund sufficiency you might be eligible for compensation at the end of the claims period or possibly earlier.

CLAIMS NOT RELEASED

(Questions 15 - 16)

15. What if my pipes/fittings leak as a result of improper installation?

Filing a claim in this settlement does not compromise your rights to pursue legal action against a third party for certain forms of improper installation (such as a nail in the pipe, etc).

16. I have a health problem and KITEC pipes and/or fittings in my home. Are issues related to health included in this settlement?

Claims in the Kitec litigation did not include any allegations or evidence of health issues or impact and we know of none. Health issues are not covered by the settlement.



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17. What should inspectors tell their clients regarding this settlement if a property has KITEC pipes?

Inspectors should inform clients of the settlement and advise them to file a Claim Form even if they have not yet experienced a leak.

18. If I am selling my property, what am I required to disclose to potential buyers and/or the subsequent owner?

The laws regarding the disclosure of information to potential buyers and/or subsequent owners vary depending on the state or province. If you are planning on selling your home and have a Kitec System, you should consult with a real estate lawyer in this regard.

If you have filed a Claim Form, you must advise potential buyers and/or subsequent owners that you have filed a claim and the terms of the release (as disclosed in the Agreement).

19. Should plumbing be replaced if a problem has occurred?

Yes. If the problem is with KITEC pipes or fittings you should have a licensed plumber look at your pipes and replace the defective pipes or fittings. You should also file a Claim Form in order to be eligible to receive payment under the settlement. Please navigate to ["Completing the Claim Form"](#) at the top of the page for more information.

20. Should plumbing be replaced if a problem has yet to occur?

If you suspect a problem with your Kitec pipes or think they might be defective, you should have a licensed plumber inspect them. Even if you have not had any repairs or damage, you should register yourself in the settlement by filling out and submitting a claim form. Please navigate to ["Completing the Claim Form"](#) at the top of the page for more information.

You should continue to monitor your Kitec System. The first sign of failure for the fittings is a buildup of white residue on the outside of the fitting. The first sign of failure for the pipe is a blackening of the pipe and/or a bulging of the pipe. Typically problems occur first near the hot water tank.

21. How do I obtain further information?

You may obtain specific details about the Settlement itself by contacting the Settlement Administrator via telephone (1-877-337-1293) or at the address below. Additionally please visit the [Case Documents](#) page for relevant case information.



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Kitec Claims Administrator
PO Box 6001
Larkspur, CA 94977-6001

OR

Canadian Kitec Claims Administrator
PO Box 3355
London ON N6A 4K3

22. Can a condominium association file a claim or does each owner/unit need to file on an individual basis?

If the condominium association is the entity that would be responsible for the plumbing of the condominium project then they would be able to register with the claims administrator. However, if the residents would be responsible for the plumbing, then the individual should file a claim. In both cases, the Condominium Agreement should be submitted with the claim form.