HOLDFAST
Right First Time!

Innovation Plus Imagination

SAY YES TO MS! from Holdfast

☑ 100% Solvent & Isocyanate Free

- UV Resistant
- Excellent adhesion
- No bubble formation
- Can be painted
- Easy to tool
- Tidy finish

ENVIRONMENTALLY FRIENDLY

Holdfast's MS Range:

Adhesive + Sealant -	FIX ALL HIGH TACK MS
Sealant + Adhesive -	FIX ALL 220LM MS
Clear Sealant + Adhesive -	CRYSTAL CLEAR MS ALL 202
Fire Rated Sealant -	FIX ALL MS FIRESTOP FR

www.holdfast.co.nz

HOLDFAST
Right First Time!

Innovation Plus Imagination

WHY MS?

What are MS Polymers?

- **S**ilyl **M**odified Polymers (modified silicone is technically wrong)
- Properties of silicones and polyurethanes **+ more**
- Moisture curing
- Low and high modulus types
- More than 30 years successful in Japan

MS vs. PU

✓ **Does not contain isocyanates or solvents**	✓ Excellent adhesion
✓ **UV Resistant**	✗ Can be painted, yet overtime it cracks
✓ No bubble formation	✗ Contains isocyanates and solvents
✓ Can be painted over with waterbased paints	✗ PU forms $C0_2$ during curing, this may give rise to bubbles.
✓ Good extrudability, even at low temperatures	✗ Poor UV resistance(colour & cracking)
✓ Good workability	✗ Needs dry surface to apply
✓ Excellent adhesion to most substrates	✗ Not available in clear
✓ Permanently elastic properties, also at low temperatures	✗ Poor adhesion to PVC
✓ Excellent adhesion to PVC	

THIS PROVES MS IS THE BEST!

MS Does not contain solvents or isocyanates, which means:

- ✓ no need for safety labels
- ✓ no shrinking
- ✓ plastics and PS can be bonded without risk for deterioration

ENVIRONMENTALLY FRIENDLY

MS is UV Resistant, which means:

- ✓ it is has durability
- ✓ it is colour stable

See test results on reverse of page.

WHY USE OLD TECHNOLOGY?

MOVE FORWARD WITH MS!

References, independent statements that confirm the advantages of MS:

KANEKA

See document attached

- silyl terminated polyether, referred to as MS Polymer was developed by Kaneka Corp., Osaka, Japan
- MS is a leading elastomeric sealant in Japan
- MS is not a silicone, nor polyurethane!
- MS has good adhesion to various substrates
- MS has excellent durability & paintability
- MS cures at ambient temperatures

BRANZ BUILD Magazine (April/May 06)

See document attached

BRANZ Builders Mate Newsletter (June 2007 Issue23)

See document attached

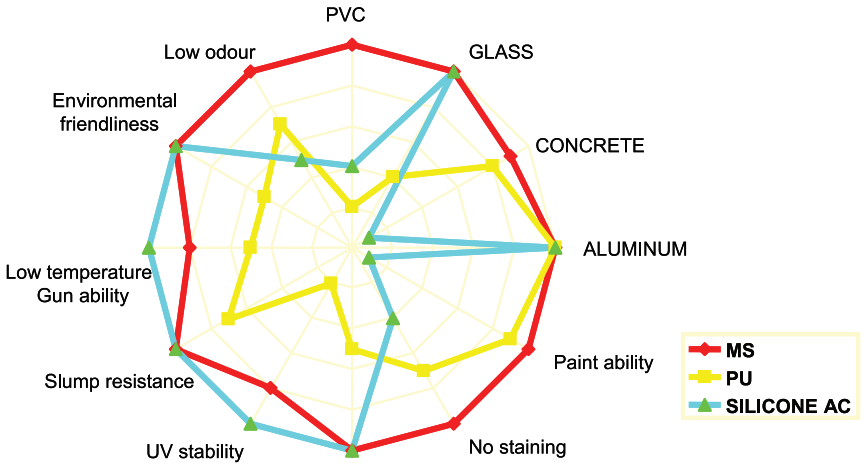
Factual proof that Polyurethanes are not as durable as MS Polymers.

SAY YES TO MS!

HOLDFAST
Right First Time!

Innovation Plus Imagination

WHY MS?



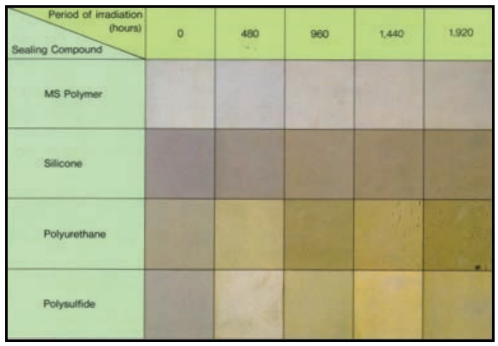
The Proof...

MS Does not contain solvents or isocyanates, which means:

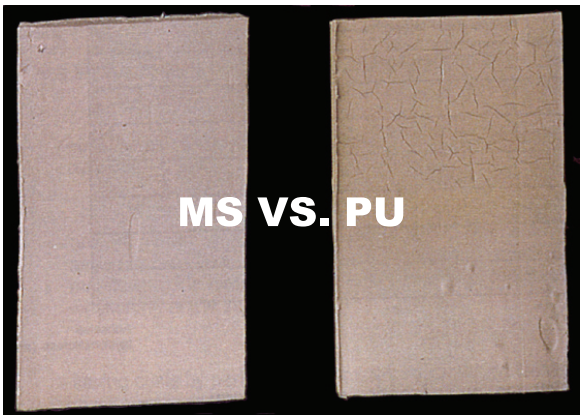
- ✓ no need for safety labels
- ✓ no shrinking
- ✓ plastics and PS can be bonded without risk for deterioration

MS is UV Resistant, which means:

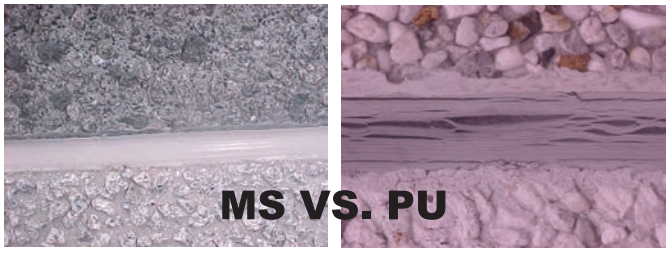
- ✓ it is has durability
- ✓ it is colour stable.



UV Radiation Test
Sunshine weathering tester: Suga Test Instruments WEL-SUN HC type
Thickness of the sheet of sealing compound: 3mm
Temperature of the black panel: 63°C
Watering time: 18 minutes/120minutes



Polyurethanes: UV Stability
Result after six weeks strong UV Radiation



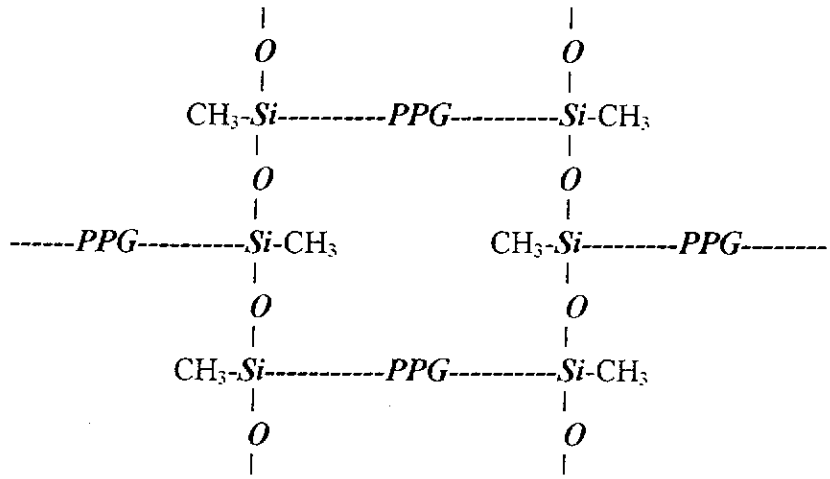
UV Radiation (after 10 years)
Result after six weeks strong UV Radiation

SAY YES TO MS!

III. What is MS Polymer

KANEKA MS POLYMER®, silyl terminated polyether(see Figure 1.), hereinafter referred to as MS POLYMER, was developed by Kaneka Corp., Osaka, Japan (ref. 2, 3, 4, and 5), and has been widely used in high performance construction sealants for over 15 years in Japan. MS sealant, with its well acknowledged advantages: good adhesion to various substrates, excellent durability and paintability, is now positioned as a leading elastomeric sealant in Japan.

MS POLYMER, cures at ambient temperatures through a cycle of hydrolysis and condensation reaction at terminal silyl group, with atmospheric moisture in the presence of curing catalyst, to form the crosslinking structure, shown below.



The resulting crosslinked network can be thought of a polyether cured through siloxane linkages(-Si-O-Si-, a stable chemical bond) or siloxane linkage cured through polyether linkages. **This is not Silicone, nor Polyurethane!**

This unique curing and cured polymer network offers various advantages in MS sealant formulated with MS POLYMER.

Recently, some silane modified polyurethane based sealants are found in the European market which claims to be "MS sealant." Since these sealant contains urethane and urea linkages in their polymer backbone which is not in the case of MS POLYMER, therefore, it should not be called as MS sealant.

RESEARCH

by Mark Jones, BRANZ Materials Manager

Putting sealants to the test

BRANZ recently compared the performance of several 'modified silicone' sealants with conventional sealants, such as silicone, polyurethane and polysulfide sealants. Here's how they performed.

Modified silicone sealants have been increasingly accepted over recent years to the point that they have now begun to dominate the market for external building applications. They combine the adhesion and mechanical properties of polyurethanes with the excellent durability and weatherability of silicone sealants to give mechanically stable, durable polymers. In addition they can be painted, unlike most silicones, adding to their appeal.

Durability testing of 10 sealants

For several years BRANZ has been investigating the durability of building sealants and how New Zealand conditions affect their long-term adhesion. Accelerated weathering of identical sets of 10 commercially available sealants was carried out using a xenon arc UV/water-spray chamber, and fluorescent ultraviolet/condensation equipment with both UVA and UVB lamps. A similar set of specimens was placed on the BRANZ exposure site to compare with long-term natural exposure.

Accelerated UV techniques have been extremely useful in rapidly assessing the durability of materials in the presence of UV radiation, but there is some inconsistency between results from the different techniques available (UVA lamps, UVB lamps and xenon arc lamps) and natural in-service performance in natural light (see Figure 1). The output of the UVA lamps is a good simulation of summer sunlight up to a point, but this drops off in intensity at higher wavelengths, a region where some polymeric materials are particularly UV-sensitive. The higher energy, lower wavelength UVB lamps degrade polymeric materials faster, but they can give anomalous results due to the higher energy UVB/UVC (270–295 nm) region that is not present in sunlight. The output of xenon arc lamps is widely recognised as the most consistent with summer sunlight.

The integrity of the sealants was monitored over about 8,000 light hours (14 months) of accelerated UV exposure. This is industry practice to estimate the durability of sealants over a 10–15-year period of natural exposure. After this 14-month period, the sealant samples were examined and the tensile adhesive properties of the sealants assessed.

Some surface cracking

Generally the sealant samples subjected to the UVA fluorescent lamps were still in very good condition, although some polyurethane sealant samples were beginning to show signs of surface cracking. This cracking appeared worse on the samples exposed to the higher intensity UVB lamps (Figure 2) and the xenon arc lamps. Similarly, small cracks were evident on the surface of the modified silicone sealants exposed to UVB lamps, with a worse effect observed on the xenon arc samples (Figure 3). The surfaces of the silicone and polysulfide sealants appeared to be in very good condition on all the exposed samples.

Excellent adhesion for modified silicones

Tensile adhesion tests were performed on aluminium substrates to assess the effect of the accelerated weathering exposure on the sealants, as well as tensile strength and elongation of individual sealants.

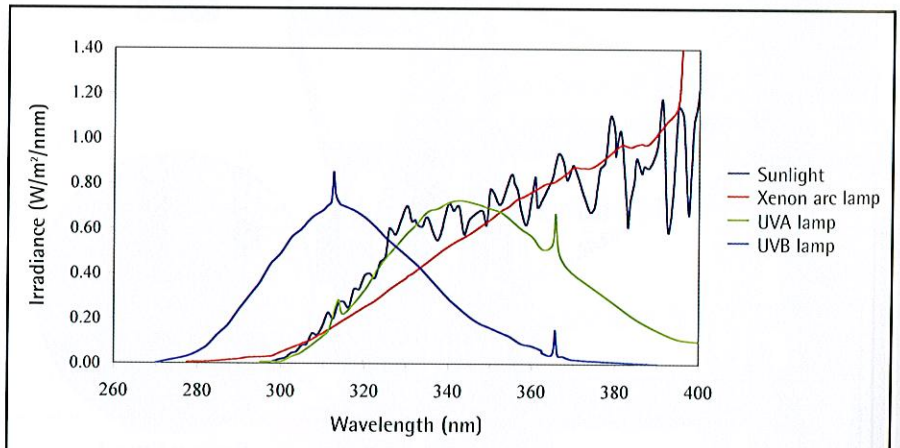


Figure 1: Comparison of UV outputs of accelerated weathering lamps. (Information courtesy of QPanel Lab Products.)

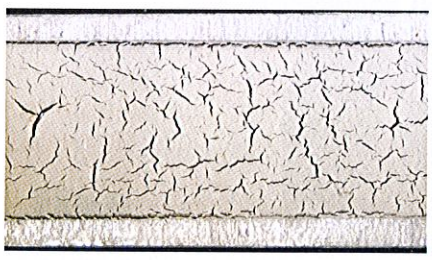


Figure 2: Polyurethane sealant surface after exposure to UVB lamps.

Figure 3: Modified silicone sealant surface after exposure to xenon arc lamps.

Generally the tensile adhesive properties of the modified silicones were significantly higher than those of the silicones, polyurethanes and polysulfides, both before and after exposure, indicating excellent adhesive properties. Figures 4 and 5 show typical results from the work. The UV exposure does not appear to have a detrimental effect on the tensile adhesive properties of the modified silicone sealants, even though the sealant surfaces showed signs of cracking. There is a slight decrease in the tensile extension of these sealants after the UV exposure.

The silicone sealants have excellent weatherability and their adhesive performance is largely unaffected by UV exposure, but the weathering has again affected their tensile extension. The polysulfide sealants also performed satisfactorily with only a slight loss of tensile adhesion strength observed and good tensile extension retention after each of the accelerated UV weathering tests.

However, Figures 4 and 5 show that the polyurethane sealants did not perform well after the accelerated weathering, particularly after exposure to the UVB fluorescent lamps and xenon arc lamps. These sealants showed a significant deterioration in both tensile adhesive and extension properties. In some cases, the tensile properties were reduced by over 70%.

Modified silicone performed well

This study indicates that modified silicone sealants perform very well after exposure to the three most popular accelerated UV weathering exposure tests. They are substantially more durable than polyurethanes and possess excellent adhesive and mechanical properties. They also have comparable weathering properties to the conventional silicone sealants.

Although it is difficult to predict the durability lifetimes of the sealants accurately, the results from these tests suggest that these modified silicone sealants will meet the durability requirements of the New Zealand Building Code.

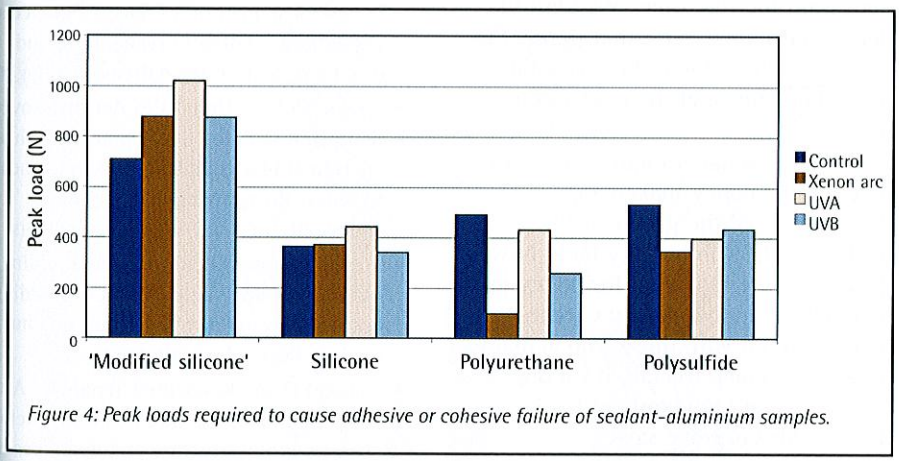


Figure 4: Peak loads required to cause adhesive or cohesive failure of sealant-aluminium samples.

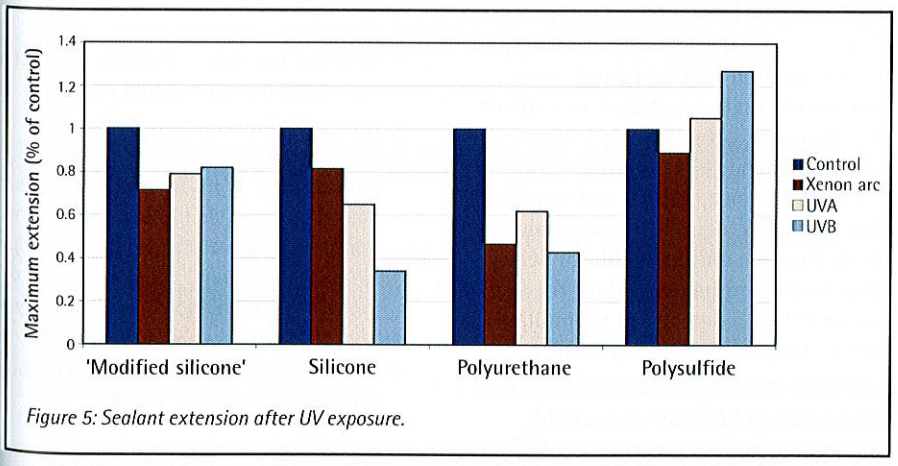


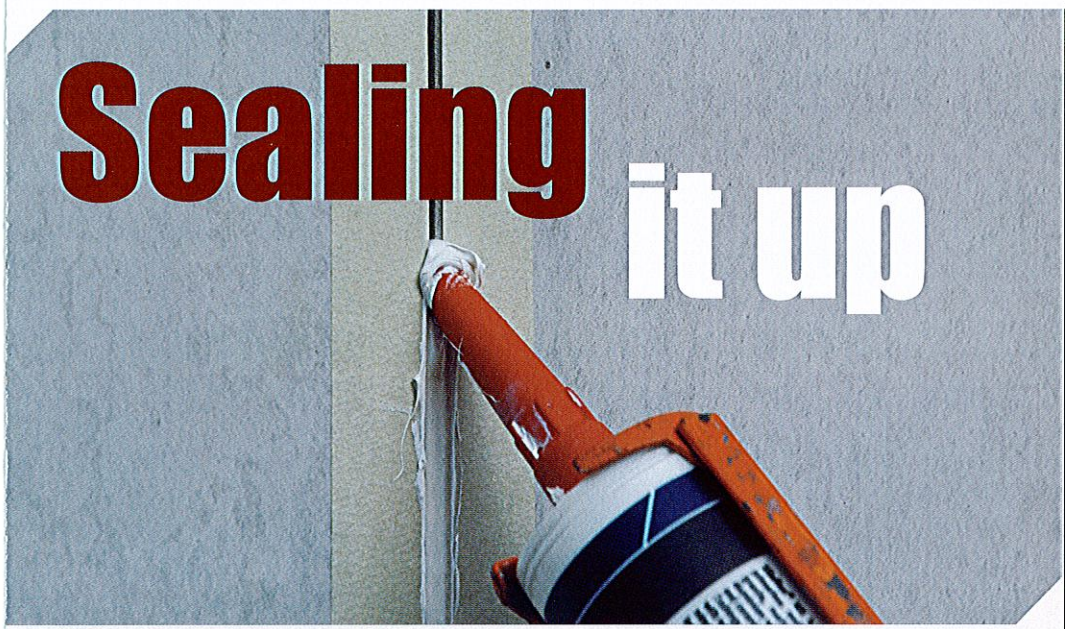
Figure 5: Sealant extension after UV exposure.

FREE TO ALL BUILDERS

BRANZ

BUILDER'S MATE

ISSUE 23 | JUNE 2007



Sealing it up

Choosing the right sealant and applying it the right way are crucial to the effectiveness of the seal.

Sealants are used in joints to keep out moisture and air. The continued effectiveness of a sealant joint depends on the choice of sealant for the substrate and the exposure conditions, the joint dimensions and the soundness of the material it is applied to.

Choice may be limited by compliance documents to the New Zealand Building Code, which incorporates specific requirements for certain uses. For example, an ISO 11600: 2002 compliant neutral-cure sealant is prescribed in section 9.2.4.1 of E2/AS1for control joints in bricks and in 9.9.8 for penetrations through EIFS. Generally, however, the applicator should use the sealant specified by the designer.

Sealants are usually classified by chemical or movement type. The manufacturer's recommendations should be carefully followed because sealants may vary widely in formulation and performance between manufacturers. Recent research (BUILD April/May 2006, pages 94–95) compared the performance of several modified silicone sealants with silicone, polyurethane and polysulfide sealants. The study showed that modified silicone performs very well after exposure and can be substantially more durable than polyurethanes.

Design of the joint is also critical, particularly the width-to-depth ratio. Joint design including joint preparation, priming, application and maintenance is covered in detail in BRANZ *Bulletins* 440 and 441.

Check the soundness and priming of the substrate material before application. >

INDUSTRY NEWS

Building consent help

The Department of Building and Housing has released a new publication aimed at helping designers, builders and homeowners' agents work through the building consent process. It is called *Guide to applying for a building consent (simple residential buildings)* and is available free either in hard copy, or by downloading a PDF from www.dbh.govt.nz.

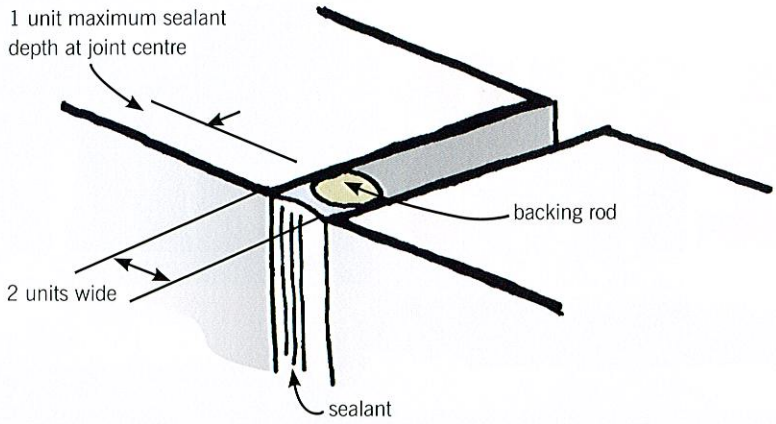
It covers issues to consider and describes the minimum documentation that should be supplied with an application to demonstrate compliance with relevant clauses of the Building Code. There are sample drawings of site plans, foundation plans, floor plans, elevations, sections, and construction details, plus a design summary check sheet.

HAMMER 'N' NAILS

Inside:

Win!

An Arges 82 mm 1100 W planer worth $199



Sealant joint profile.

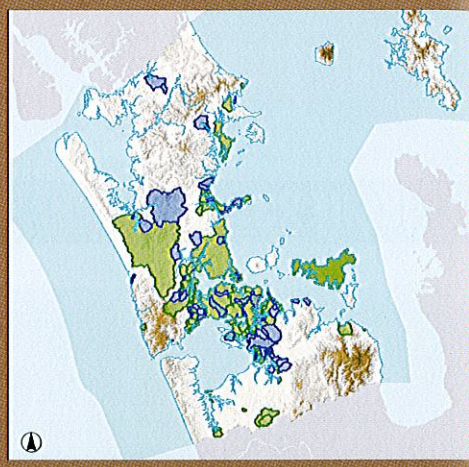
Continued from previous page

Loose substrate material should be removed and surface contamination cleaned off. Use masking tape to prevent contamination of adjacent surfaces, and remove it immediately after tooling. If a primer is used then the sealant must be applied to the joint within the time noted on the primer container.

The best way to apply sealant is to push the gun in the direction in which the sealant is applied, as illustrated in the front page photograph. Pulling the gun during application is more likely to leave trapped air and points of weakness.

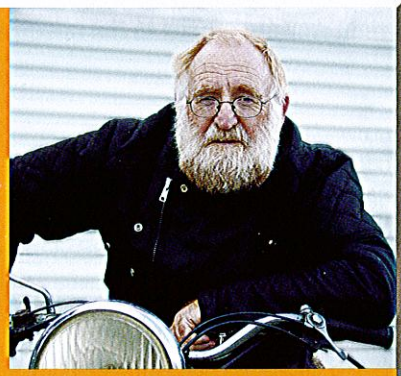
Finally, tool the joint to ensure that the sealant completely fills the joint to the required depth. No air should be trapped in the joint if it is to remain effective. The joint may require protection until the sealant cures.

PRODUCT INFORMATION



The Auckland Regional Council now has a stormwater discharge consents mapping system live on its website. This mapping system shows the location of stormwater consent applications, as well as stormwater networks discharge consents, anywhere in the Auckland region. You can find it in the maps section at www.arc.govt.nz.

Dribblings from the Old Geezer



So often I hear from older chippies that they are not going to bother trying to become a Licensed Building Practitioner. "Bugger that", they often eloquently acclaim, going on to tell how they're going to go under the radar until they retire.

It will be a sad loss if the experienced of our industry are allowed to just skulk off this way. We hear anecdotes about cowboys in the industry and how we need to get them out. Yep … couldn't agree more, but for God's sake, don't drive out the older workers.

Think about it – not many of them are the cowboys that we need to purge. Those are usually the boys in a hurry who do need to be slowed down a bit.

The LBP regime needs to be sold not only to the general public so they are enthused about it, but also to our own people to embrace it. So far I am not convinced that this is being done very well. We're all in this together and we all should be proud of our skills and not be scared to show it.

Des Molloy