Tight lining (size reduction via roll down or swage lining)

When is it used and what are the benefits?

Tight lining is a process that temporarily reduces the size of the new pipe, enabling it to be drawn into the degraded pipe. Once inserted, the PE pipe expands to create a tight fit with the old pipe, minimising reduction in flow capacity.

What are the concerns?

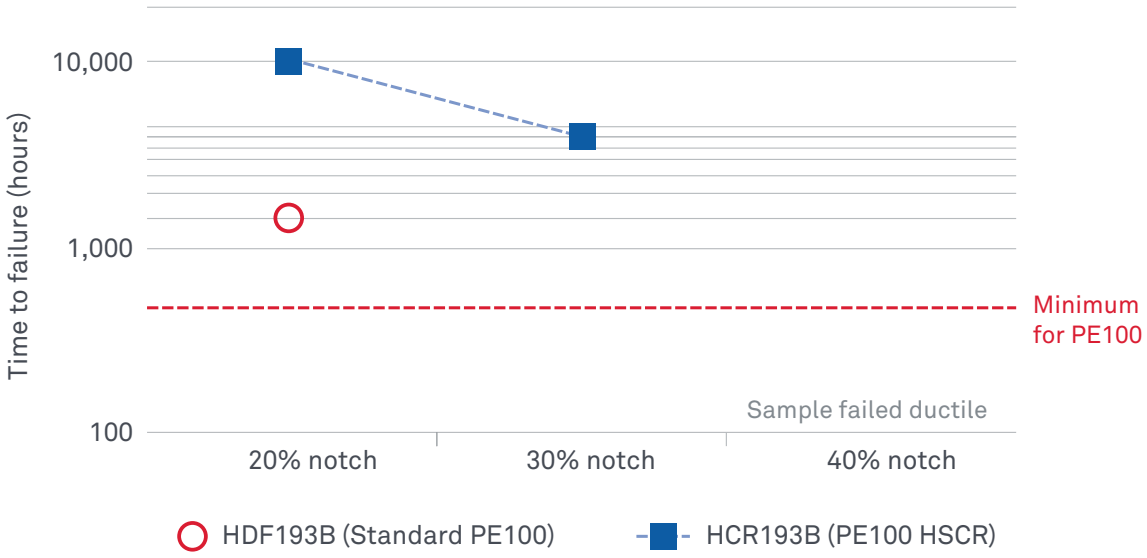
Although gouging due to movement of the new pipe is minimised as the diameter of the inserted pipe is temporarily reduced, some gouging may still occur at the base of the new pipe. Another concern is the integrity of butt welds that are forcibly reduced in diameter. Damage to butt welds caused by the size reduction process may not be immediately evident and may initiate slow crack growth failure in PE100 materials.

How can the use of Alkadyne® HCR193B address these concerns?

Alkadyne® HCR193B is a PE100 HSCR resin that has been specifically developed to achieve stress crack resistance that is greatly superior to standard PE100 resins. Alkadyne® HCR193B complies with AS/NZS 4131 and meets the requirements of POP016 for High Stress Crack Resistant PE100. The use of Alkadyne® HCR193B inhibits crack growth from notch type damage and defects possibly generated in butt welds during installation. This provides an enhanced level of confidence during the tight lining process compared with other PE resins.

Surface damage is a significant risk when installing pipe using the tight lining method. The depth of any surface damage on the installed pipe cannot usually be accurately determined in the field, and may possibly be greater than the 10% of the wall thickness that is allowed by the installation standard. Testing has shown that Alkadyne® HCR193B meets slow crack growth resistance specifications even with notches deeper than 10% of the wall thickness as shown in the chart below.

Notched Pipe Test (ISO 13479)



NOTE: Test covered 110mm pipes with varied notch depth tested in hydrostatic pressure test at 920kPa/80°C

Figure12: Notched Pipe Test ISO 13479 with varying notch depth