

Rust Converters

1.1.6

What Are Rust Converters?

“Rust converters” are acidic solutions (usually tannic acid and/or phosphoric acid based) that are intended for direct application to rust-covered steel to convert the rust (hydrated ferric oxide) into inert, insoluble products.

So Why Mechanically Clean When You Can Convert Rust Easily?

The suppliers of these “rust converter” products claim that there is no need to remove the rust, potentially saving the applicator a great deal of work in removing rust mechanically. These suppliers also make the claims that the conversion products adhere tightly to the steel to form a protective barrier that prevents further corrosion and also provides a suitable surface to paint.

But, according to Standards Australia’s “Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings”, **AS/NZ2312:2002**, “There is a **considerable amount of published literature which refutes such claims**, stating that where any conversion may occur, **complete penetration of rust and reaction with it is unlikely.**”ⁱ Standards Australia declares that with some ‘rust converters’, only a colour change occurs, whilst in the case of phosphoric acid-based rust converters the **phosphoric acid** has little or **no reaction with hydrated ferric oxide** under normal conditions, and that unreacted acid can become **trapped beneath subsequently applied paint**.

The Standard states that the use of a ‘rust converter’ with any coating systems quoted in AS2312 Table 6.3 (coating systems for direct application to hand-cleaned and power-tool cleaned rusty steel) is not recommended, and **will detract from their subsequent performance**.

How Well Do The Conversion Products Adhere To The Steel?

Rust converters are not film formers – they cannot seal or bind porous, loosely adhering rust on steel. Rust converter suppliers claim is that wetting agents in the rust converter will penetrate into the rust and that the conversion products firmly adhere, but this does nothing to reduce the porosity of the converted rust. The conversion products may be harder and more cohesive, but anything that was loose before conversion will still be loose after conversion. The porosity of the surface also inhibits complete removal of any residual (unreacted) acid.

And herein lies a problem – how do you know how much “rust converter” to apply to a rusty surface? Assuming that the solution can penetrate 100% into the rust (unlikely), how can one calculate the correct spreading rate, or measure degree of conversion? Too much “rust converter”, and you will have residual acid on the surface; too little, and not all the rust will be converted. Residual acid is not visible or easily detectible, so it is difficult to tell if you have rinsed off all the excess acid.

Conclusion

The protection of steel against corrosion depends very much on the **degree to which steel has been cleaned of corrosion products** and **profiled** correctly to take a high-performance zinc-rich primer. There are no quick and easy shortcuts to achieve this. Surface preparation must be by means of abrasive blast cleaning or power tool cleaning to achieve the appropriate standard (Please refer to Dulux[®] Protective Coatings Tech Note 1.1.2.)

ⁱ Standards Australia AN/NZ2312:2002, “Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings”