The Building Envelope Authority

MCRMA CAMPAIGN SET TO IMPACT CORRECT FASTENER DRIVER CHOICE

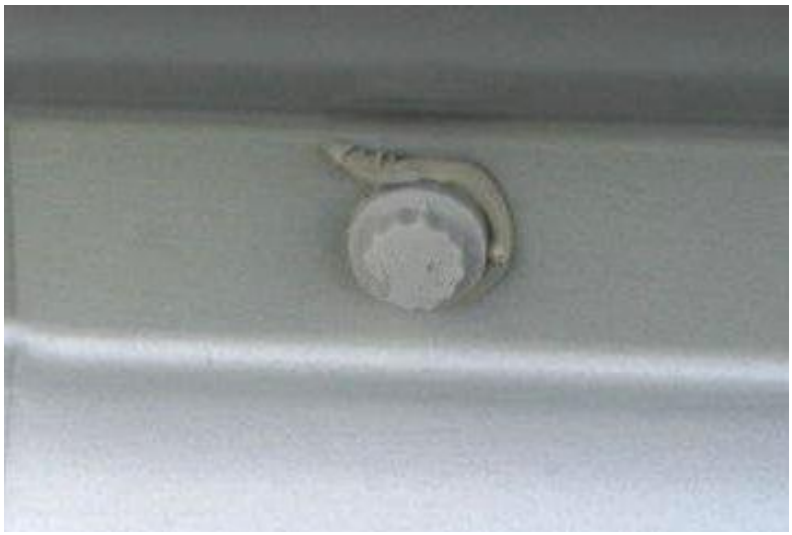
The Metal Cladding and Roofing Manufacturers Association (MCRMA) has launched a campaign highlighting that impact drives should NOT be used to install fasteners and only appropriate and recommended screw guns should be used for the installation of fasteners. Screw guns are an installer essential when working in roofing and cladding construction, as they ensure that the optimum mechanical performance of a self-drilling fastener is obtained, guaranteeing the integrity of the building envelope.

Impact drivers should not be used! Their repetitive impact action can lead to drilling failures, reduce the fastener pull-out performance, and damage the coating or strip the moulding on the fastener head. The use of an impact driver may therefore make void any warranty provided by the fastener supplier.

The majority of fastener-related problems on site are simply from using incorrect tooling. Self-drilling fasteners are designed to be installed with the constant rotational drive of a purpose-designed screw gun. Drill points do not perform well at very high speeds, so a maximum of 2000 rpm is recommended. Whilst this may appear counter-productive, the burn-out rate will be substantially less. Once an attempt at drilling holes has failed, case hardening of the steel support will make subsequent attempts even more difficult.

In today’s construction, higher tensile grades of steel are being increasingly specified and used. The typical tensile strength of light section purlins, rails and spacer bars has increased considerably in recent years.

Published minimum tensile grades of 39N/mm² and 450N/mm² are now commonplace and with the allowable tolerances the maximum could be nearer to 600N/mm². This higher tensile material stretches the self-drilling performance tolerance. Therefore, it is imperative that the correct installation tools are specified to minimise the number of cases where fasteners are 'burning out’.

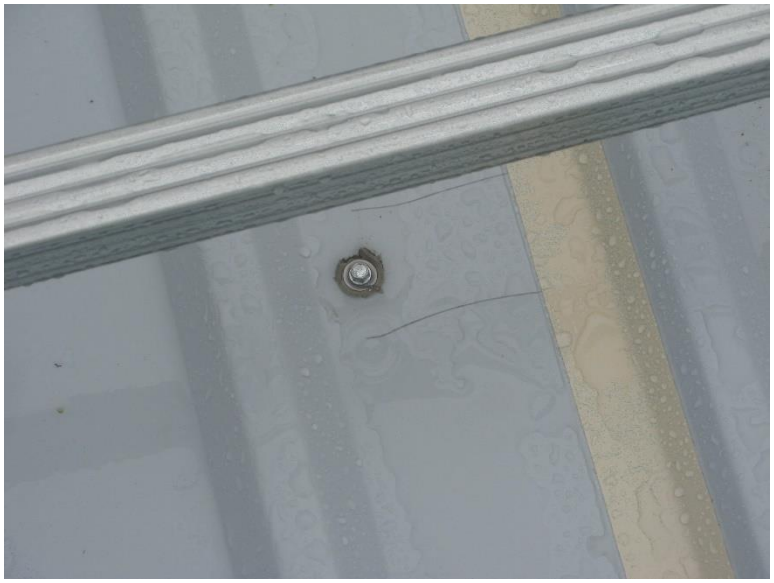


Ripped and deformed washer caused by the use of an impact drive and which resulted in the ingress of water

Self-drilling fasteners, the preferred type used for roofing and cladding constructions, are to be installed with either a battery screw gun or a 110V screw gun, with the compatible head socket/bit and fitted with an adjustable depth locating nose piece unless the fastener design incorporates features to prevent overdriving.

For external drive screws, e.g., hexagonal and bi-hexagonal (moulded) heads, the socket must be deep enough so that the drive is on the flange at the base of the head. This will give more efficient drilling of the fastener as well as preventing damage to the top of the fastener head.

This is particularly relevant to magnetic sockets where, on some designs, the magnet is very shallow and could damage the coating to the head. This is made worse as the magnet naturally attracts a build-up of swarf. The recess on sockets must be deep enough to clear the top of the fastener head.



Fully deformed washer caused by overdriving

Applying excessive end load via the screw gun whilst the fastener is drilling could also be counterproductive and increase the risk of the fastener ‘burning out’. This is, perhaps naturally, more common on thicker hot rolled/heavy section steel supports

The exact speed of the screw gun will vary depending on the fastener type and the steel substrate, but the slower a fixing is installed, the higher the mechanical performance obtained. Screw guns have a slower rotational speed than impact drivers, but far more efficient in that the installer will not have to attempt to drill into the substrate more than once or try and use multiple fasteners, which in itself creates more problems.

In summary

Do

- Install roofing and cladding self-drilling fasteners using either a battery screw gun or a 110v screw gun.
- Ensure that the screw gun is fitted with a correctly adjusted depth locating nose piece (unless the fastener has features to prevent overdriving)
- Install roofing and cladding self-drilling fasteners at speeds less than 2000 rpm whether or not the fastener has features to prevent overdriving
- Always use the correct PPE to avoid personal injury
- Ensure correct sockets and drive bits are used
- Any magnet must be recessed deep enough to clear the head
- External sockets must drive on the flange at the base of the screw head

Do not

- Install roofing and cladding fasteners with either an impact driver or a dry wall screw gun.
- Apply excessive end loads (bodyweight force) via the screw gun whilst the fastener is drilling, particularly on thicker hot rolled/heavy section steel supports.

Adoption by industry of the guidance in this article will lead to better and more consistent standards of metal roofing and cladding construction.

Correct specification screw guns are available for purchase from the MCRMA fastener manufacturers. MCRMA member companies can advise on the suitability and performance of materials, systems and assemblies and are featured on the MCRMA web site at www.mcrma.co.uk

This article first appeared in Total Contractor magazine, August 2021

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