TG14:20

Supplementary Couplers and Check Couplers

NASC
National Access & Scaffolding Confederation

SUPPLEMENTARY COUPLERS

Supplementary couplers are sometimes incorrectly referred to as check couplers or safety couplers.

Supplementary couplers are active couplers which add strength to the connection, whereas check couplers are used to give added security in situations of high risk to personnel but cannot be relied upon to provide additional strength to the joint.

Typical design applications where high coupler forces could be expected and which may require the use of supplementary couplers include:

- Diagonal braces in the lower lifts of a scaffold.
- Suspended and slung scaffolds.
- Loading platforms.
- Lifting gantries.
- Truss-out and cantilever scaffolds.
- Falsework structures.
- Pedestrian bridges and walkways.
- Temporary roofs and supporting scaffolding.

The NASC has undertaken several tests on a variety of couplers to establish the appropriate recommended load values when these are used as supplementary couplers. It has been acknowledged that Scaffolding Companies use a variety of couplers in their general work, therefore it is not considered appropiate that a single coupler manufacturer should be considered when determining the most suitable recommended safe working load. It is also accepted that Scaffolders may not necessarily fully nest the couplers when the second coupler is used as a supplementary.

Because of the ultimate strength limitations on the main coupler, a supplementary coupler arrangement, unless verified, is normally limited to the use of one main coupler plus one supplementary coupler. This arrangement would be expected to give the safe working loads in the table below. This information supersedes that implied in BS EN 12811-1 Annex 1 table C1 and further referenced in TG20:13 Design Guide, Clause 5.9.2.

Table 1: Maximum Safe Working Loads

Main Coupler plus Supplementary Coupler arrangement	Maximum Safe Working Load
Two BS EN 74-1 Class A couplers (right angle couplers only) Two BS EN 74-1 Class B couplers (right angle couplers only)	9.1kN 15.2 kN

The review of tests undertaken by the NASC concluded that the loads stated in the above table are appropriate for guidance, although it is recognised that other documents recommend different values. The variance in values obtained from the NASC testing show that the load capacity of two couplers differ significantly depending on the positional arrangement and type of coupler used. It was found that generally, fittings of different types when used together perform differently to when the same type is used. This is the overriding parameter in this guidance, when considering the use of supplementary couplers.

The NASC will conduct further tests using swivel couplers and further advice will be given when this data is available. It is recommended that swivel couplers are used only as the supplementary coupler in the meantime.

The tests also indicated that generally, nested drop forged couplers provided a greater resistance to load than the equivalent pressed steel couplers nested together. The variation in design of certain couplers means that some of them do not nest or sit touching in key areas, which negates the positive effect of the supplementary fitting. It was found that the couplers which nested more closely, with more areas touching each other, gave the best result. The arrangement of nesting that delivered the highest load capacity using two drop forged right angle couplers is shown in this image.

The Maximum Safe Working Load given in Table 1 assumes that the direction of the applied load is from the main coupler towards the supplementary coupler. The capacity in the direction from the supplementary coupler towards the main coupler remains the capacity of the single main coupler. If restraint is required in the two opposing directions, then a supplementary coupler should be fitted to BOTH sides of the main coupler and the value in the table can then be considered to apply in both directions.

If the estimated force in the tube is more than the maximum safe working load figures, then either further advice should be sought from the coupler manufacturer/supplier as to the load bearing capacity of their particular couplers or an alternative scaffold design solution should be sought.

Only right-angle couplers (also known as doubles) or swivel couplers should be used as supplementary couplers. Putlog couplers (also known as singles) should never be used in this application. A half coupler could be used and might be found to fit closer to the original coupler.

BS EN 74-1 gives test requirements for supplementary couplers, it is recommended that the coupler manufacturer's advice should be sought as to the suitability of his couplers to act as supplementary couplers, including the way they must be used. Orientation of the fitting plus the supplementary coupler due to the shape and bearing surfaces must be in line with manufacturers' recommendations.

CHECK COUPLERS (OR SAFETY COUPLERS)

Typical design applications where high risk to personnel situations may arise and which may require the use of check couplers are hanger tubes on slung scaffolds and rakers on cantilevered platforms or truss-outs.

Only right-angle couplers (also known as doubles) or swivel couplers should be used as check couplers. Putlog couplers (also known as singles) should never be used in this application.

Where a combination of high coupler forces and a high risk to personnel simultaneously occurs, it may be necessary to install a supplementary coupler arrangement plus a check coupler or an alternative scaffold design solution should be considered.

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