

Cembre three 'm' rule assures crimped lug connections

- ***REQUIREMENTS OF BS7609 CODE OF PRACTICE FOR THE 'INSTALLATION AND INSPECTION OF UNINSULATED COMPRESSION & MECHANICAL CONNECTORS FOR POWER CABLES WITH COPPER OR ALUMINIUM CONDUCTORS'***

1. Choose a **manufacturer** providing crimp tooling, die set and lugs **matched** to work together to give assured crimping performance.
2. Each lug should be clearly **marked** with a reference on the barrel or palm which enables the user to verify that the lug selected is the correct size and type for the conductor. The manufacturer's name or logo also allows the correct die set and crimp tool to be selected from their recommended list.
3. Prepare the conductor by stripping the insulation back so that, when assembled, it cannot be trapped in the barrel of the lug. The strip length should be equal to that of the barrel. Take care to avoid damage to the conductor strands during the stripping operation. Exposed conductor strands should be cleaned to remove any particles of insulation.
4. Fully insert the conductor into the barrel. If an inspection hole is provided, check the conductor is fully inserted.
5. Crimp the lug in accordance with the manufacturer's instructions. Pay careful attention to the positioning of the die on the barrel and, if multiple compressions are required, the sequence in which they are made.
6. Examine the completed crimp to check:
 - a. Marking on lug shows it is correct for the conductor type and size.
 - b. The marking on the lug shows the correct die set was used.
 - c. No insulation is trapped in the barrel.
 - d. Excess grease is removed from insulation and lug.
 - e. If an inspection hole is provided, the conductor has been fully inserted.
 - f. It is NOT over-compressed causing excessive flash or burrs which are detrimental to the performance of the joint. It is NOT under-compressed, as this is detrimental to the performance of the joint. If any doubt exists, samples should be produced for test purposes.



- **IN ADDITION TO THE REQUIREMENTS OF BS7609 CEMBRE ADVISES**

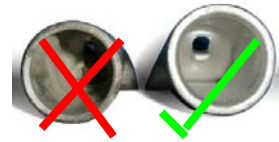
It is imperative that the installation is not compromised by a poor choice of Copper tube lug, or by the use of a 'mismatched' crimping system.

- Cembre supports the Approved Cables Initiative (ACI) Code of Practice to ensure that the conductor used is both third-party approved and appropriately marked.

- The lug should have an equal current carrying capacity to that of the conductor. Copper tube lugs designed and manufactured by Cembre achieve maximum electrical conductivity with minimum resistance by the use of high purity, electrolytic Copper having a cross sectional area equivalent to that of the conductor.



- Beware lugs manufactured from thin wall Copper tube as they have the potential to cause elevated temperatures when the conductor is carrying high levels of current.



- Recommended procedures for conductor preparation and crimping Cembre Copper tube lugs, including number, position and sequence where multiple compressions are required, - are defined in Cembre data sheet DS194/Rev02 attached.



- Cembre Copper tube lugs are also fully annealed after pressing to alleviate residual stresses within the palm area and ensure optimum mechanical and electrical performance at the connection interface.
- Ensure Cembre crimp tooling is certified as calibrated regularly and serviced correctly and all equipment, particularly die sets, is inspected for damage or wear and maintained in good condition.

- **DIE SELECTION**

- ALWAYS refer to the die selection chart in every Cembre general products catalogue. A die selection guide booklet is also included with every new Cembre crimp tool. Additional copies available from Cembre.

- **NUMBER AND SEQUENCE OF COMPRESSIONS PER LUG**

- The number and sequence of compressions shown in the die selection guides are specifically determined for Cembre lugs from the lug type and design, the force applied by Cembre crimp tooling and the bite width of the matched die set.
- ALWAYS apply the correct number of compressions as per the die selection guide in order to assure the performance of the joint after crimping.
- Apply each compression in the correct sequence to avoid distorting the lug.

- **EXTRA FLEXIBLE CONDUCTORS - WHICH LUG AND DIE COMBINATION?**

- Cembre Copper tube lugs for extra flexible conductors 35 to 185sqmm have the same cross sectional area of Copper as standard Cembre A-M lugs for LV applications, but with a slightly wider inner diameter to more easily accommodate the fine strands.
- Above 185sqmm it may not be possible to use the correct size standard lug with an extra flexible conductor. For example, say a 240sqmm lug does not fit on a 240sqmm extra flexible conductor, it is acceptable and common practice to use the next larger size of lug, here 300sqmm.
- The lug **MUST** however be crimped with the die set appropriate to its size, 300sqmm, since using a 240sqmm die set will distort the lug and be detrimental to performance. For guidance, see the A-M range in Cembre general products catalogue.

- **COMPACTED CONDUCTORS - WHICH LUG AND DIE COMBINATION?**

- For low voltage applications use Cembre A-M Copper tube lugs. Matched crimp tooling and hexagonal die sets **MUST** be used as per Cembre general products catalogue.
- Always apply the rule that the cross sectional area of the lug should at least equal that of the conductor so, when using compacted conductor it is essential that the correct size lug be used, even if the fit appears 'loose' prior to crimping.
- The apparent 'loose' fit is due to the air between conductor strands having been 'compacted out' during manufacture, causing a slight reduction in the diameter of the conductor. The resulting gap between conductor and lug barrel wall is fully taken up during the crimping process.
- Do not be tempted to move down a lug size to obtain a tighter fit, as there will then be insufficient copper in the shoulder or palm of the lug. As an example, for 185sqmm compacted conductor use A37 lug, ME37-C die set and appropriate Cembre crimping tool.