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## Transfer Oil Assembling Instructions

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GOMAX® QUADRA DN2 – DN4 – DN6

### Scope

The scope of this training procedure is to train operators in assembling QUADRA DN2, DN4, DN6 hoses and fittings using a conventional/commercial hydraulic crimping machine, in addition to our customized tools RXA007, RXA005, RXA011, RXA012 in order to provide advice for those customers who need a heavy duty crimping machine.

It is essential to fulfil the training process in the hose assembly procedures in order to make high quality Transfer Oil – GOMAX QUADRA DN2, DN4 and DN6 hose assemblies.

Transfer Oil – GOMAX QUADRA hose assemblies are designed and manufactured to be installed in air conditioning & refrigeration applications.

Only the use of genuine Transfer Oil – GOMAX QUADRA hoses, fittings, recommended tooling and full compliance with the following Transfer Oil – GOMAX QUADRA assembly instructions can guarantee safety and conformity with standards.

### **WARNING!**

**NON-COMPLIANCE WITH THESE RULES CAN LEAD TO THE PREMATURE FAILURE OF THE HOSE ASSEMBLY AND THE LOSS OF WARRANTY.**

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## 1. Crimping machine selection

### 1.1. Selection of the crimping machine:

The crimping machine is the most important machine you will need when assembling GOMAX QUADRA hoses DN2, DN4, DN6. For this reason it is very important that the selection of this equipment is made carefully, taking into account every characteristic of the parts that will be assembled and the performance of the finished product.

For the assembling of the GOMAX QUADRA hoses DN2, DN4, DN6 with the GOMAX Quadra fitting and ferrules there are many different hydraulic crimping machines available on the market; some manufacturers and models of suitable hydraulic crimping machines are listed below.

- **UNIFLEX – HYDRAULIC GmbH, model HM200;**
- **FINN POWER, model P20;**
- **O+P S.r.l, model TUBOMATIC H47/E EL.**

This is just a short list of the suitable crimping machines that can be found on the market.

The two main characteristics that are fundamental to obtain a perfect crimping result on GOMAX QUADRA assemblies are:

- the selected crimping machine **SHOULD** have 8 crimping dies;
- the selected crimping machine **SHOULD** have a control for the position of the dies: this control can be digital with a display for the crimping data or a simpler electro mechanical vernier dial for setting the final position of the dies during the



Digital Control



Electro Mechanical control with vernier dial

## 1.2. Selection of the dies:

The selected crimping machine should be equipped with 3 set of dies:

Set of dies diameter 6,8 mm for GOMAX QUADRA DN2.

Set of dies diameter 9,0 mm for GOMAX QUADRA DN4.

Set of dies diameter 12,0 mm for GOMAX QUADRA DN6.

In order to obtain a correct final crimping diameter, which is fundamental to ensure the performance of the assembled hose, the correct die set should be installed on the crimping machine which should be set to achieve the final diameter of the crimped ferrule as listed in the table below (Table 1).

HOSE	DIES SET Diameter (mm)	CRIMPING Diameter (mm)
DN2	6,8	7,0 ± 0,1mm
DN4	9.0	10,0 ± 0,1mm
DN6	12,0	12,4 ± 0,1mm

Table 1

The die sets diameters indicated in table 1 are those specified for the crimping machine as used by Transfer Oil for the production of GOMAX QUADRA hose assemblies. If the indicated die sets are not available for the customers selected crimping machine then, before ordering the selected crimping machine, please contact Transfer Oil Customer Service.

The use of inadequate dies sets, for example too small, will result in irregular shape and ridges on the external surface of the ferrule and the assembly will not be able to sustain the pressure.

The use of a die set too big will cause the incapability of reaching the final crimping diameter of the ferrule.

If among the dies available for your machine you are missing the suitable one, please don't attempt to crimp the fitting regardless, contact your assembling machine dealer to supply the missing die set.

## 2. Preparing the assembly

Cut the GOMAX QUADRA capillary hose to the required length using Transfer Oil cutter for capillary hoses type WXA004. If you wish to use another method of cutting it is important that the cut is perpendicular (90° angle with a tolerance of 5%)



We recommended the use of the cutter WXA004.



## 3. Assembling the ferrule and the insert

Slip the nut over the hose (depending on fitting type). Ensure that the threaded side is pointing towards the end of the hose that needs assembling.  
Slip the ferrule over the hose end, ensure correct positioning, in line with the hose end (due to the design it can be only be mounted in one way).

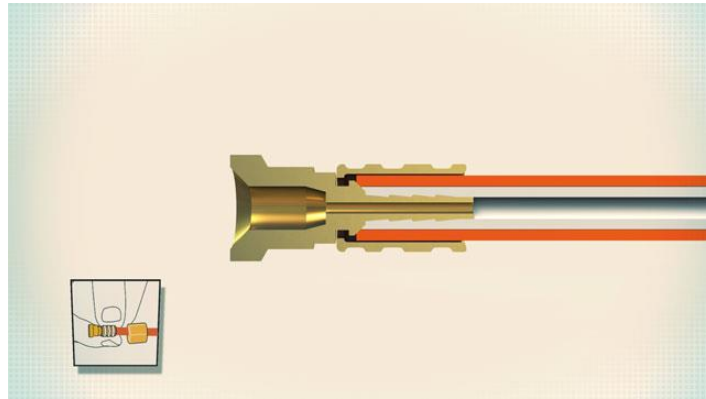


Push the insert into the hose end you want to assemble. Assemble/put the insert together with the nut onto the hose end.



#### 4. Crimping of the ferrules

Make sure that the insert is completely inserted into the hose by positioning it in line with the end of the hose. Pay attention not to move the components already fitted and slide the ferrule over the hose towards the insert positioning in line with the insert.



Slide the Ferrule over the hose towards the insert positioning.

After having adequately set the crimping machine parameters, start crimping the ferrule making sure that the whole length is being crimped by the dies

##### 4.1. Setting the crimping machine:

Depending on the crimping machine that is used, referring to the User Manual provided by the manufacturer of the crimping machine, set it in the correct way in order to achieve the final crimping diameter of the ferrules.

Refer to table 1 of this procedure to select the correct set of dies and the correct crimping diameter.

##### 4.2. Crimping:

Assembling GOMAX QUADRA hoses requires crimping the hose in one step. This is to allow a uniform deformation of the ferrule.

After having adequately set the crimping machine parameters (4a), start crimping the ferrule making sure that the whole length is being crimped by the dies.

Take particular care that during the crimping stroke of the machine the components of the assembly don't move into an incorrect position.

Let the machine reach the final position that you have previously set using the machine control device and only when you are sure that the machine has completed the crimping stroke, open the dies and remove the assembled end of the hose.

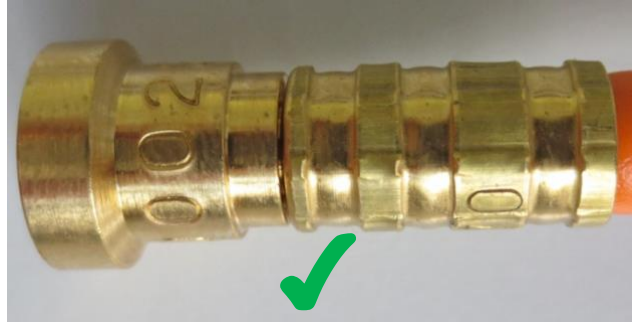
## 5. Checking

Once that the assembling of the hose end is finished, check the correct positioning of the components

- **make sure that the entire surface of the ferrule has been swaged**



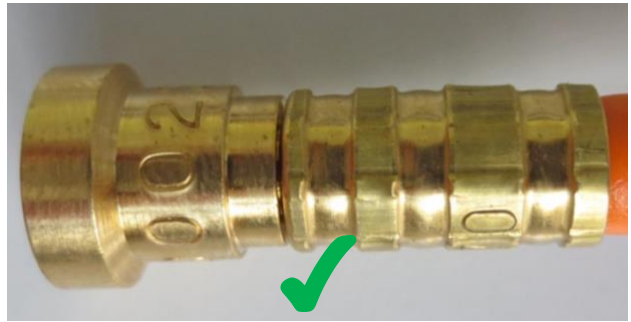
Example of ferrule not completely swaged



- **make sure that the crimped ferrule and the insert are correctly positioned at each end of the assembly**



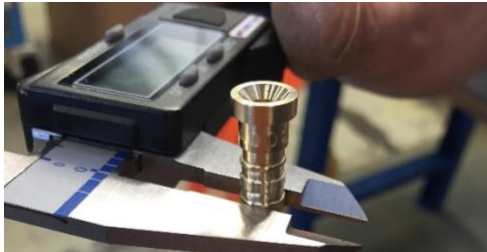
Insert not crimped in the proper position



To have verification of correct crimping, carry out a check with a vernier.

- Measure the diameter of the second and third rings of the swaged ferrule and check that the value is included in the crimping dimensional tolerance of  $\pm 0,1\text{mm}$  (see table number 1 - page 5).
- During this measurement rotate the hose end so that you can verify if the machine is making a proper round crimping.

If the crimping diameter is not within the range of tolerance for that particular hose type, cut the hose end and repeat the crimping operation.



Measurement of the third ring of the ferrule



Measurement of the second ring of the ferrule

### WARNING!

**WHEN ASSEMBLING AN ELBOW FEMALE DO NOT MOVE NOR ROTATE IT, OTHERWISE YOU RISK TO DAMAGE OR EVEN BREAK THE INSERT INSIDE THE HOSE COMPROMISING THE ENTIRE HOSE ASSEMBLY.**