

南聖卡埃塔諾, 2005 年 5 月 6 日

中文翻譯如下, 原文附於翻譯後面

公證書

敬致阿雷格裡港市政廳 – RS

我們特此證明, 在 CNPJ 註冊, 編號為 **69.036.630/0001-12** 的 **CROLS MAGNATEC R.C. LTDA.** 公司是我們公司供應商之一, 完全滿足我們對 “維護焊接材料” 的需要。

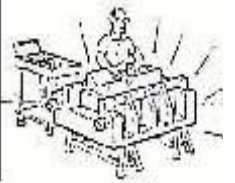
Yours faithfully,



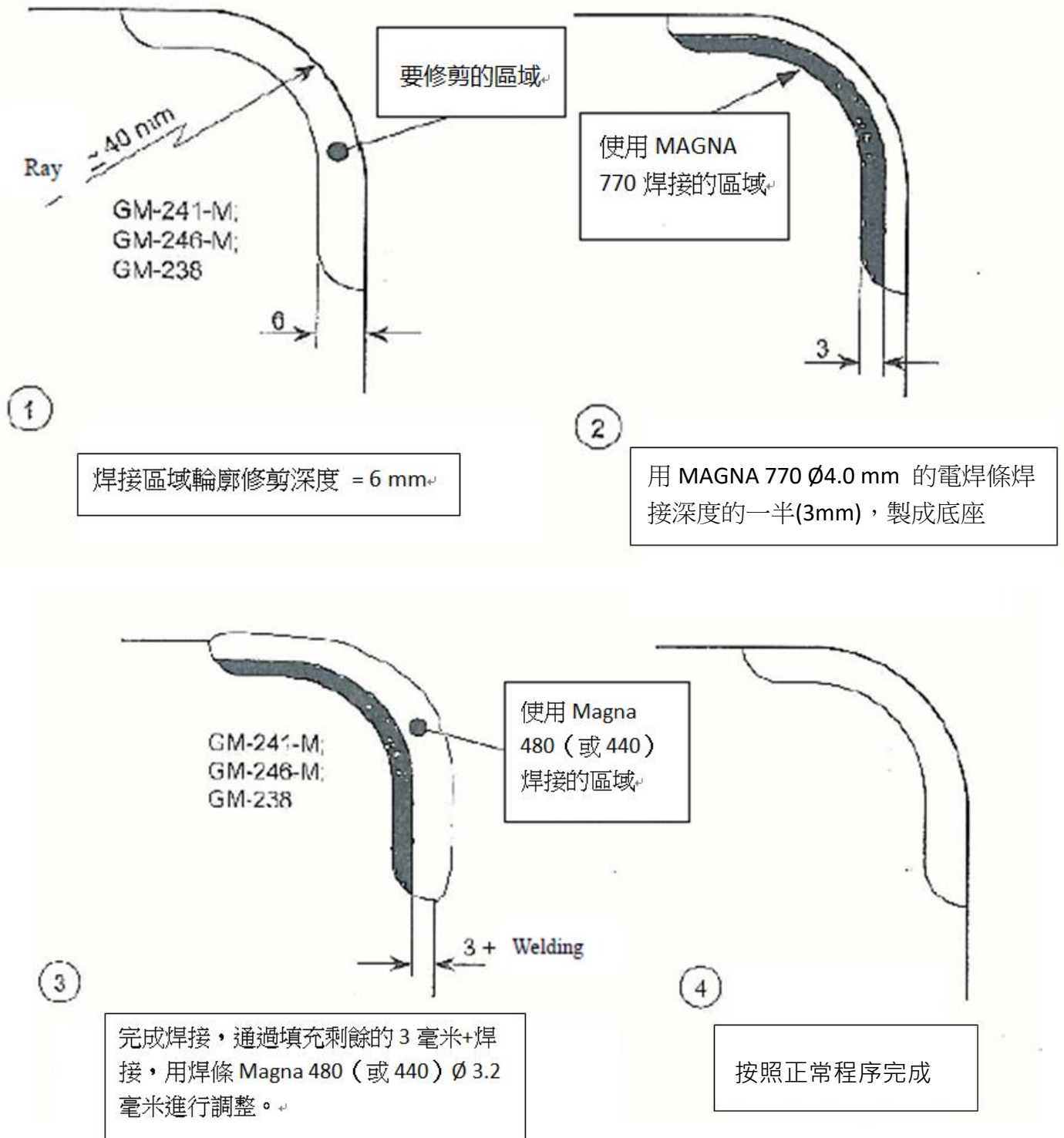
Geraldó Barbi - Purchasing Manager



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
 TOOLS - S. J. TOOLS
 WELDING PROCEDURES

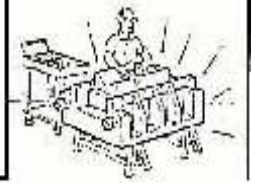


用電焊條 MAGNA 770 和 480 (或 440) 焊接拉伸、成型工具模圓角的焊接程序





MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



維護和改進成型工具的焊接程序 – S. J. 工具

用電焊條 MAGNA 770 和 480 (或 440) 焊接拉伸、成型工具模圓角的焊接程序

MAGNA 焊條是焊接中最新技術使用的結果，而與傳統焊條相比，它們在使用和操作方面非常不同。

在巴西，它們由 CROLS MAGNATEC LTDA. 公司提供，這是 ITW 的 Maintenance Welding 的子公司名稱。

此程序中指的 MAGNA 電焊條是：

電焊條 MAGNA 770B，其中字母 B 表示電焊條直徑為 $\varnothing 5/32$ “ 或 4.0 mm，編號 GMB (kardex) 991500000543;

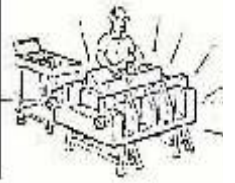
電焊條 MAGNA 480 A(或 440)，其中字母 A 表示電焊條直徑為 $\varnothing 1/8$ “ 或 3.2 mm，編號 GMB(kardex) 991500000681;

一些相關信息：

- 1.) MAGNA 電焊條不需要存放在乾燥箱中。它們不吸收濕氣。
- 2.) 在使用 MAGNA 焊條焊接之前，不需預熱鑄鐵。
- 3.) 在所示的程序中，焊接一個總深度為 6 毫米 (每道 3 毫米厚)，焊敷 MAGNA 770 和 MAGNA 480 (或 440) 40 毫米圓角的焊敷量為各種電焊條每公斤 320 毫米長。
- 4.) MAGNA 電焊條焊後無需錘擊，更不論是用壓實還是消除應力了。然而，在某些狀況下 (小於 2% 的狀況)，當使用 MAGNA 770 時，鑄鐵的結構和成分及其對沙子，油和時間 (使用壽命) 的污染程度可以決定這種需求。焊接時，焊工會察覺到這種需求。
- 5.) 無需去除 MAGNA 電焊條焊道間的焊渣 (鋁電焊條除外)。在焊接過程中，它們已經去除了焊接區中的雜質。
- 6.) 用焊條 MAGNA 770 打底後，在焊覆 MAGNA 480 (或 440) 層之前，無需進行任何類型的修整。
- 7.) 焊接完成後，我們可以用砂輪/組裝端或其他類型的研磨方法，啟動修整焊接區域的調整過程。
- 8.) 用 MAGNA 770 和 MAGNA 480(或 440) 焊條焊接後，焊接區域必須保持硬度高於 720 勃氏硬度，相當於洛氏硬度 C 64 度。
- 9.) 建議焊接電流，參考如下： 焊條 MAGNA 770，焊條直徑為 $\varnothing 5/32$ “ 或 4.0 mm。機器 AC/DC (直流) 或 AC (交流) = 90 - 140 安培。• 電焊條尺寸 480 (或 440)，電焊條直徑為 $\varnothing 1/8$ “ 或 3.2 mm。最小電流 = 80 安培 - 最大電流 = 100 安培。注意：電流調整必須根據各個情況和焊工的經驗進行。

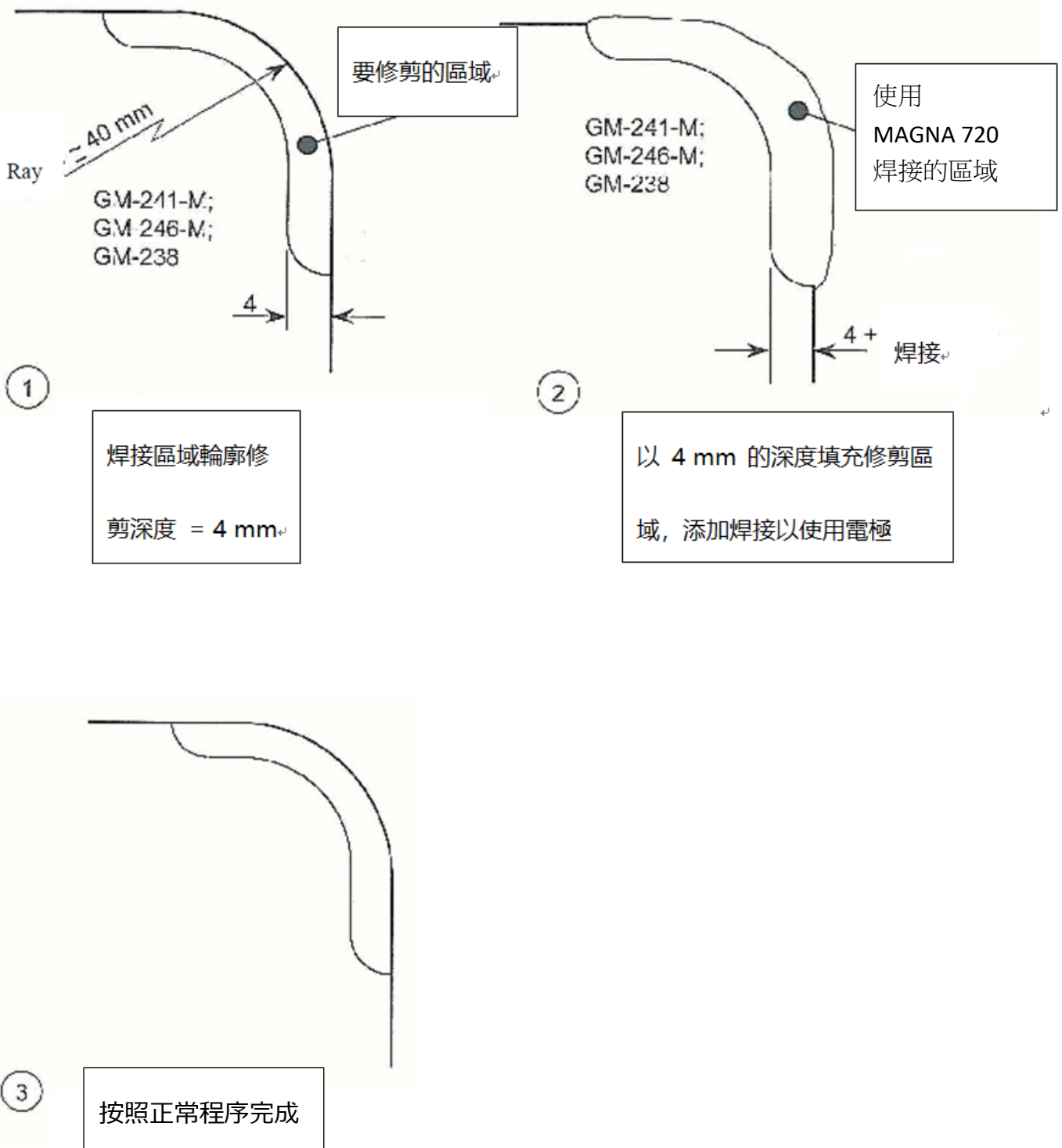


MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS - S. J. TOOLS
WELDING PROCEDURES



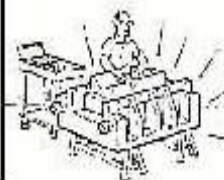
維護和改進成型工具的焊接程序 - S. J. 工具

用電焊條 MAGNA 720 焊接拉伸、成型工具模圓角的焊接程序





MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



用電焊條 MAGNA 720 焊接拉伸、成型工具模圓角的焊接程序

此程序中指示的 MAGNA 電焊條是：MAGNA 720B 電焊條，其中字母 B 表示電焊條直徑為 $\varnothing 1/8$ “或 3.2 mm，編號 GMB (kardex) 991500004570;

一些相關信息：

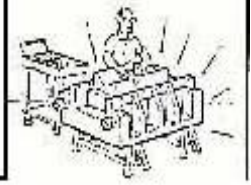
- 1.) MAGNA 電焊條不需要存放在乾燥箱中。它們不吸收濕氣。
- 2.) 在使用 MAGNA 焊條焊接之前，不需預熱鑄鐵。
- 3.) 在所示的程式中，要焊接總深度為 4 mm 的 40 mm 圓角，焊條 MAGNA 720B 的效率約為每公斤電焊條 240 mm 線性長度。
- 4.) 在 99.9% 的情況下，無論是壓實還是消除應力，都無需錘擊 MAGNA 720 電焊條的焊道。但是，在一些罕見的特殊情況下，焊工會察覺到何時需要錘擊。
- 5.) MAGNA 電焊條焊道間無需清除焊渣（鋁電焊條除外）。在焊接過程中，它們已經去除了焊接區域的雜質。
- 6.) 焊接完後，我們可以通過砂輪/組裝端或其他類型的研磨方法，啟動修整焊接區域的調整過程。
- 7.) 當使用焊條 MAGNA 720 焊接時，沉積材料和焊接母材之間將發生分子融合（GM-241，GM-246-M 或 GM-238），因此焊接區域將保持母材的硬度，只要母材的硬度在 41 和 52 洛氏“C”之間，母材的硬度將保持在+1 或-1 洛氏“C”的公差範圍內。
- 8.) 在比較這兩種程序時，我們的結論是，當僅使用焊條層 MAGNA 720 焊接時，所需的沉積材料量以及焊接時間將少於使用焊條 MAGNA 770 和 480（或 440）的兩層工藝。但是，會降低焊接區域的硬度。
- 9.) 焊接電流建議，作為參考：
電焊條 MAGNA 720，焊條直徑為 $\varnothing 1/8$ “或 3.2 mm。
直流電焊機（直流）= 60 - 100 安培。
交流電焊機（交流電）= 65 - 100 安培。

注意：微調必須根據各種情況和焊工的經驗進行。

程序類型	硬度	效率	工作/成本
1 層電焊條 MAGNA 720	41 – 52 RC	240 mm/Kg	較低
2 層電焊條 MAGNA 770 和 MAGNA 480 或 440	64 RC	160 mm/Kg	較高



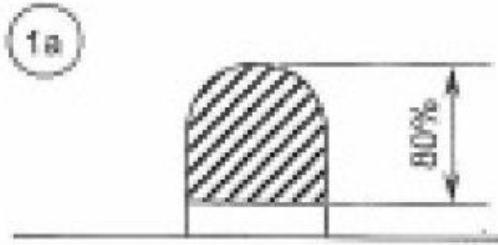
MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



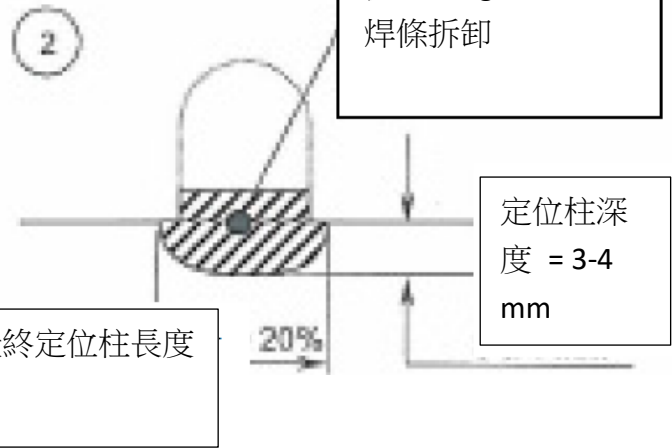
維護和改進成型工具的焊接程序 – S. J. 工具

使用 MAGNA 100、770 和 480 (或) 440 電焊條製造定位柱的程序

準備校正定位柱工具

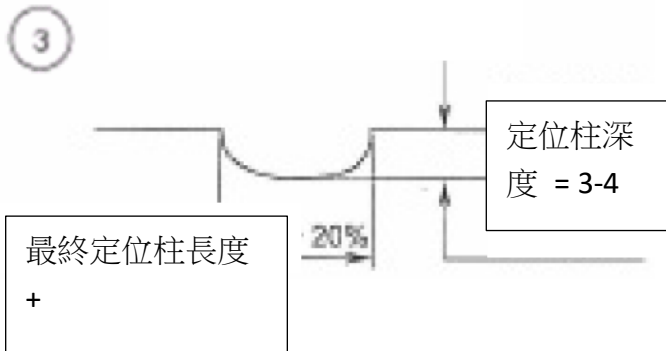


用磨盤進行修整
去除 80% 的定位柱高度。



1b

如果沒有定位柱，請按照以下步驟 2 標記將要建造的位置並修剪定位柱深度。



如果修整是通過機械或手動加工，則可以將步驟 1 和 2 一起製作。切割的磨盤不能用碳基的磨盤。

拿掉剩餘的現有定位柱 (20%)，並使用開槽倒角電焊條 MAGNA 100 \varnothing 1/8 “修剪”定位柱

“裂縫 (深度在 3 至 4 mm 之間，長度直到比定位柱最終長度大 20%)。

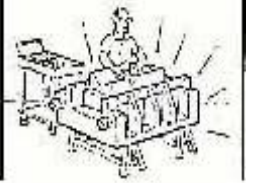
注意

不允許使用切割盤來製造定位柱裂縫，因為這些圓盤在大多數情況下由碳製成，它們將碳分子釋放到裂縫中，這些碳分子在接觸 MAGNA 焊道後會成為碳化鐵，非常堅硬的碳顆粒會危及焊接層的效率。也不可能使用黑鐵電焊條來執行此操作。

除了使用 MAGNA 100 電焊條外，我們還可以在使用切割工具、旋轉式銼刀或氧化鋁磨石除去裂縫，其顆粒在焊接過程中視為污垢去除。



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS - S. J. TOOLS
WELDING PROCEDURES

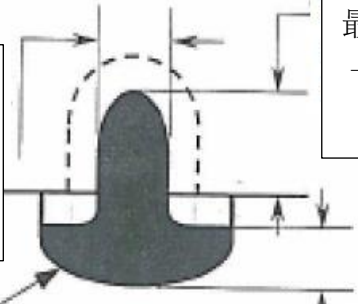


維護和改進成型工具的焊接程序 - S. J. 工具

使用電焊條 MAGNA100、770 和 480 (或 440) 製造定位柱與定位柱的程序

4

最終定位柱長
度 - (小於)
6mm



最終定位柱高度
- (小於) 3 mm

用焊條焊接
定位柱芯
Magna 770

定位柱深度的一
半或 1.5 至 2
mm

焊接定位柱，比最終定位柱尺寸小 3 mm
電焊條 MAGNA 770 \varnothing 4.0 mm。

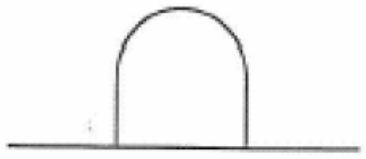
5



使用 Magna 480
(或 440) 焊條完
全焊接

使用焊條 MAGNA 480 (或 440) \varnothing 3.2 mm
在最終調整中用焊接完成調整。

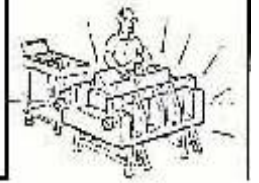
6



按照正常程式完成定位柱。



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



維護和改進成型工具的焊接程序 – S. J. 工具

使用電焊條 MAGNA 770 和 480 (或 440) 製造定位柱的程序

電焊條 MAGNA 100C，其中字母 C 表示電焊條直徑為 $\varnothing 1/8$ “或 3.2 mm，編號 GMB (kardex)

991500000544;

電焊條 MAGNA 770B(或 440)，其中字母 B 表示電焊條直徑為 $\varnothing 5/32$ “或 4.0 mm，編號 GMB(kardex)

991500000543;

電焊條 MAGNA 480A(或 440)，其中字母 A 表示電焊條直徑為 $\varnothing 1/8$ “或 3.2 mm，編號 GMB(kardex)

991500000681;

一些相關信息：

- 1.) MAGNA 電焊條不需要存放在乾燥箱中。它們不吸收濕氣。
- 2.) 在使用 MAGNA 焊條焊接之前，不得預熱鑄鐵。
- 3.) 在 99.9% 的情況下，無論是壓實還是消除應力，都無需錘擊 MAGNA 720 電焊條的焊道。但是，在一些罕見的特殊情況下，焊工會察覺到何時需要錘擊。
- 4.) 無需去除 MAGNA 電焊條焊道間的焊渣（鋁電焊條除外）。在焊接過程中，它們已經去除了焊接區中的雜質。
- 5.) 焊盤與焊條 MAGNA 770 焊接後，在塗覆 MAGNA 480 (或 440) 層之前，無需進行任何類型的修整。
- 6.) 焊接完成後，我們可以用砂輪/組裝端或其他類型的研磨方法，啟動修整焊接區域的調整過程。
- 7.) 用 MAGNA 770 和 MAGNA 480 (或 440) 焊條焊接後，根據該程式，定位柱區域的硬度必須高於勃氏硬度 720，相當於洛氏 “C” 硬度 64。
- 8.) 建議焊接電流如下，作為參考：

- 電焊條尺寸 100，電焊條直徑為 $\varnothing 1/8$ “或 3.2 mm。

最小電流 = 250 安培。 – 最大電流 = 350 安培。

- 電焊條 MAGNA 770，電焊條直徑為 $\varnothing 5/32$ “或 4.0 mm。

直流電或交流電 = 90 – 140 安培。

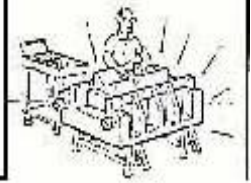
- 電焊條尺寸 480 (或 440)，電焊條直徑為 $\varnothing 1/8$ “或 3.2 mm。

最小電流 = 80 安培。 – 最大電流 = 100 安培。

注意：微調必須根據不同的情況和焊工的經驗進行。

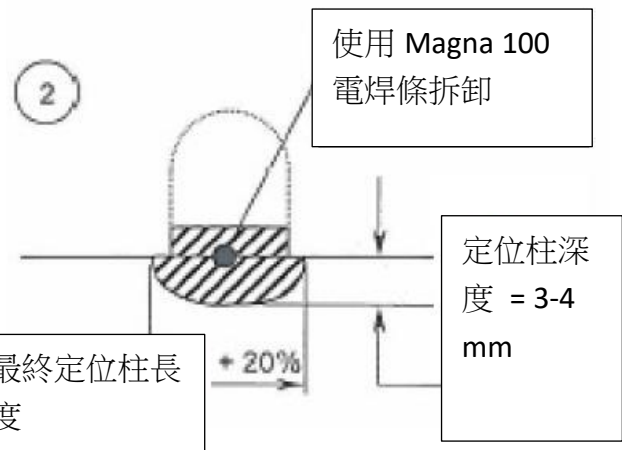
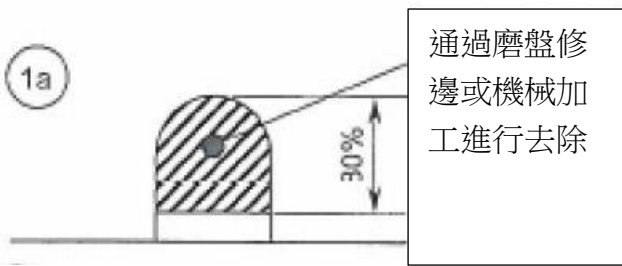


MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS - S. J. TOOLS
WELDING PROCEDURES



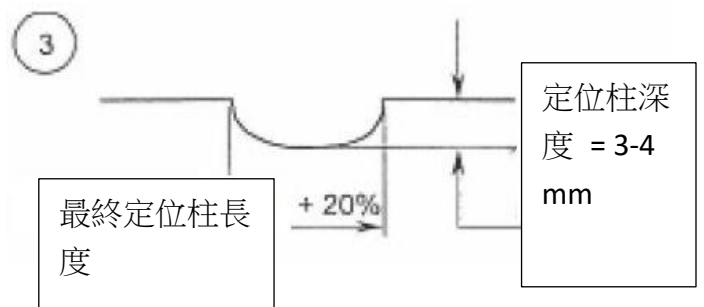
維護和改進成型工具的焊接程序 - S. J. 工具

使用 MAGNA 100 和 720 電焊條製作定位柱的程序
根據是否有前緣準備工具

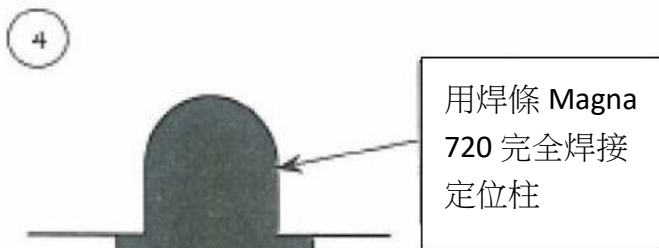


1b

如果沒有前翼緣，請按照步驟 2 標記將要構建最終翼緣長度的位置並修剪定位柱深度。



按照步驟 1a, 1b, 2 和 3, 按照程序進行兩層焊接。請參閱第 1/5 頁。



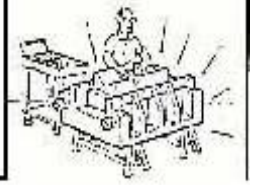
在最終調整中加入焊接，用 MAGNA 720 \varnothing 3.2 mm 電焊條焊接定位柱。



按照正常程式完成定位柱。



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



維護和改進成型工具的焊接程序 – S. J. 工具

使用 MAGNA 100 和 720 電焊條製作定位柱的程序

此程序中指定的 MAGNA 電焊條是：

電焊條 MAGNA 100C，其中字母 C 表示電焊條直徑為 $\varnothing 1/8$ “ 或 3.2 mm，編號 GMB (kardex)
991500000544;

電焊條 MAGNA 720B，其中字母 B 表示電焊條直徑為 $\varnothing 1/8$ “ 或 4.0 mm，編號 GMB (kardex)
991500004570;

一些相關信息：

- 1.) MAGNA 電焊條不需要存放在乾燥箱中。它們不吸收濕氣。
- 2.) 在使用 MAGNA 焊條焊接之前，不得預熱鑄鐵。
- 3.) 在 99.9% 的情況下，無論是壓實還是消除應力，都無需錘擊 MAGNA 720 電焊條的焊道。但是，在一些罕見的特殊情況下，焊工會察覺到何時需要錘擊。
- 4.) 無需去除 MAGNA 電焊條焊道間的焊渣（鋁電焊條除外）。在焊接過程中，它們已經去除了焊接區中的雜質。
- 5.) 焊接完成後，我們可以用砂輪/組裝端或其他類型的研磨方法，啟動修整焊接區域的調整過程。
- 6.) 當使用焊條 MAGNA 720 焊接時，焊積和焊接母材之間將發生分子熔合（GM-241，GM-246-M 或 GM-238），因此焊接區域將保持母材的硬度，只要母材的硬度在 41 和 52 洛氏 “C” 之間，母材的硬度將保持在+1 或-1 洛氏 “C” 的公差範圍內。
- 7.) 在比較這兩種程式時，我們得出結論，當僅使用焊條層 MAGNA 720 焊接時，所需的焊條材料量以及因此的焊接時間將少於使用 MAGNA 770 和 480（或 440）焊條的兩層工法，但是焊接區域的硬度會降低。

8.) 焊接參考電流，：

焊條 MAGNA 100，焊條直徑為 $\varnothing 1/8$ “ 或 3.2 mm。

最小電流 = 250 安培。 - 最大電流 = 350 安培。

電焊條 MAGNA 720，電焊條直徑為 $\varnothing 1/8$ “ 或 3.2 mm。

直流電焊機= 60 - 100 安培。

交流電焊機= 65 - 100 安培。

注意：微調必須根據各種情況和焊工的經驗進行。



São Caetano do Sul, 06th May 2005

DECLARATION OF HONOUR

To the Town Hall of Porto Alegre - RS

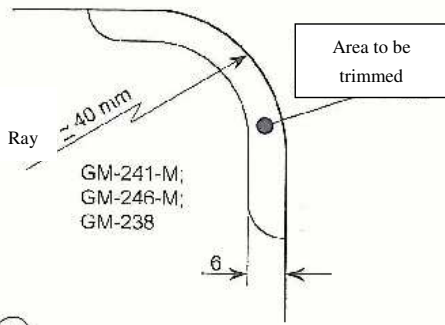
We hereby certify, for the required purposes that the enterprise CROLS MAGNATEC R.C. LTDA., registered with the CNPJ with the number 69.036.630/0001-12, is part of the list of our company's suppliers, meeting perfectly our requirements concerning the supplying of "Maintenance Welding Consumables".

Yours faithfully,

Geraldo Barbi - Purchasing Manager

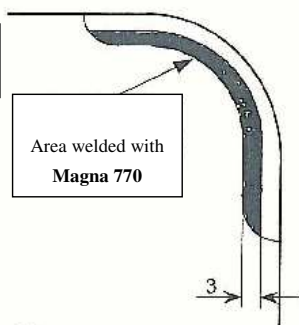


PROCEDURES TO WELD RAYS OF THE DRAWING BACK, MOULDING AND TREADING DOWN TOOLS, WITH ELECTRODES MAGNA 770 and 480 (or 440)



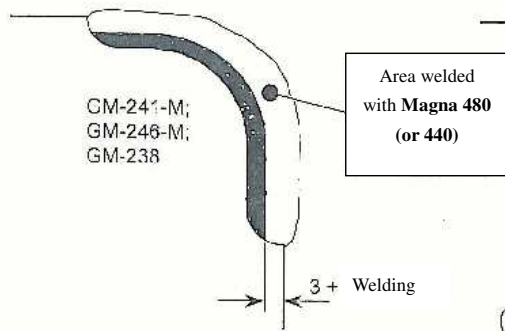
1

Welded Area Profile
Trim Depth = 6 mm



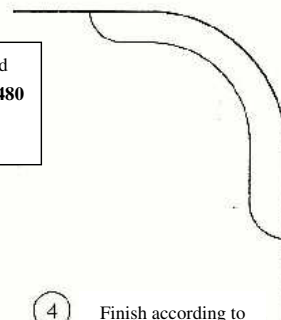
2

Weld the half (3 mm) of the depth with the electrode **Magna 770** Ø 4,0 mm, to make the base



3

Complete the welding, by filling the remaining 3 mm + welding, to adjust with the electrode **Magna 480 (or 440)** Ø 3,2 mm.



4

Finish according to normal procedure



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



**PROCEDURES TO WELD RAYS OF THE DRAWING BACK, MOULDING AND
TREADING DOWN TOOLS, WITH ELECTRODES MAGNA 770 and 480 (or 440)**

The MAGNA electrodes are the result of the most recent technology used in welding and therefore they are very different concerning use and operating if compared to traditional electrodes.

In Brazil, they are supplied by the enterprise **CROLS MAGNATEC LTDA.**, new denomination that was given to Maintenance Welding., subsidiary enterprise of ITW.

The MAGNA electrodes indicated in this procedure are:

Electrode MAGNA 770B, where the letter B indicates the electrode diameter of $\varnothing 5/32"$ or 4,0 mm, number GMB (kardex) 99150000543;

Electrode MAGNA 480 A (or 440), where the letter A indicates the electrode diameter of $\varnothing 1/8"$ or 3,2 mm, number GMB (kardex) 99150000681;

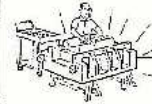
Some relevant information:

- 1.º) The MAGNA electrodes do NOT need to be stored in a greenhouse. They do not absorb humidity.
- 2.º) Before welding with MAGNA electrodes, one shall NOT pre-heat the cast iron.
- 3.º) In the procedure shown, to weld a 40 mm ray with total depth of 6 mm (3 mm to each layer), the deposition of both the MAGNA 770 and the MAGNA 480 (or 440) is 320 mm linear per kilogram of each electrode.
- 4.º) There is NO need to hammer the material deposited with the MAGNA electrodes, whether it is for compacting or to relieve stresses. However, in some cases (less than 2%), when using the MAGNA 770, the structure and the composition of the cast iron and its level of contamination with sand, oil and time (useful life) can determine that need. When welding, the welder will perceive that need.
- 5.º) There is NO need to remove the slag formed between the layers of deposited material of the MAGNA electrodes (except for the aluminium electrodes). They already remove the impurities of the welded area, during welding.
- 6.º) After the welding of the weld bead with the electrode MAGNA 770, there is NO need to make any kind of trimming, before applying the layer of MAGNA 480 (or 440).
- 7.º) After the total welding, we can initiate the process of adjustment of the welded areas with the welding trimming, through turbine/assembled end or other type of abrasive method.
- 8.º) After welding with the electrodes MAGNA 770 and MAGNA 480 (or 440), the welded area must remain with hardness superior to 720 Brinell, equivalent to 64 Rockwell "C".
- 9.º) Recommendation of amperage to welding, as a reference:
 - Electrode **MAGNA 770**, electrode diameter of $\varnothing 5/32"$ or 4,0 mm.
Machine AC/DC (Direct Current) or AC (Alternating Current)= 90 – 140 Amps.
 - Electrode **MAGNA 480 (or 440)**, electrode diameter of $\varnothing 1/8"$ or 3,2 mm.
Minimum Amperage = 80 Amps. – Maximum Amperage = 100 Amps.

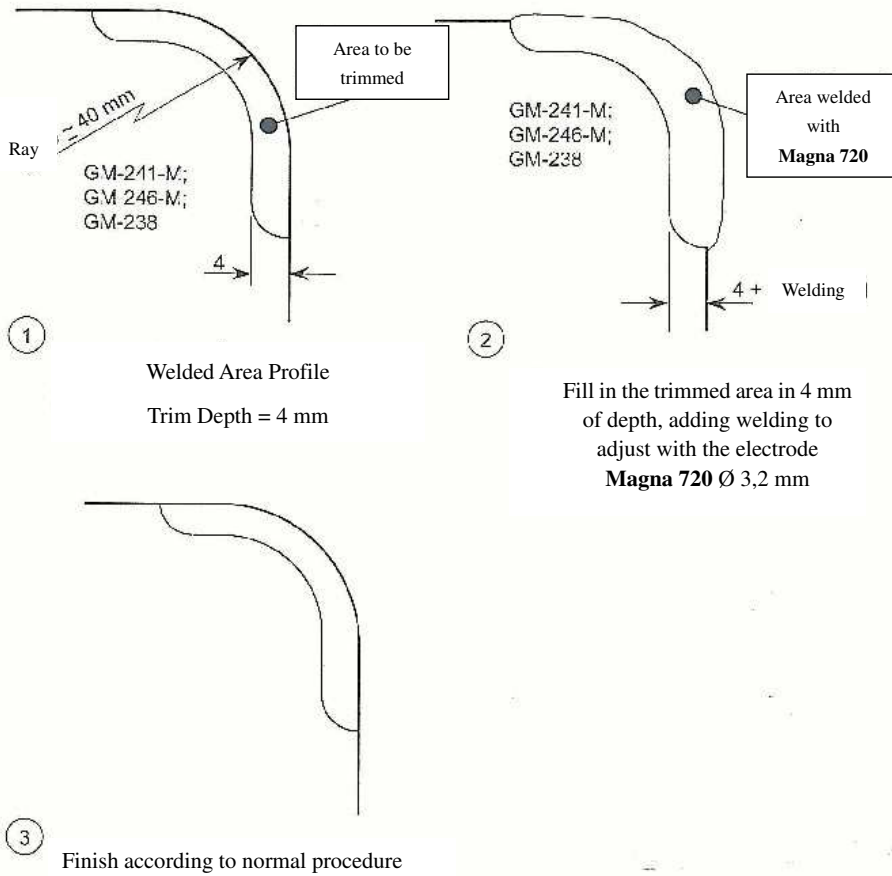
Note: The current adjustment must be done according to each situation and to the welder's experience.



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



PROCEDURES TO WELD RAYS OF THE DRAWING BACK, MOULDING AND
TREADING DOWN TOOLS, WITH ELECTRODES **MAGNA 720**





MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



**PROCEDURES TO WELD RAYS OF THE DRAWING BACK, MOULDING AND
TREADING DOWN TOOLS, WITH ELECTRODES MAGNA 720**

The MAGNA electrode indicated in this procedure is:

Electrode MAGNA 720B, where the letter B indicates the electrode diameter of \varnothing 1/8" or 3,2 mm, number GMB (kardex) 991500004570;

Some relevant information:

- 1.º) The MAGNA electrodes do NOT need to be stored in a greenhouse. They do not absorb humidity.
- 2.º) Before welding with MAGNA electrodes, one shall NOT pre-heat the cast iron.
- 3.º) In the procedure shown, to weld a 40 mm ray with total depth of 4 mm, the efficiency of the electrode MAGNA 720B is around 240 mm linear per kilogram of each electrode.
- 4.º) In 99,9% of the cases there is NO need to hammer the material deposited with electrodes MAGNA 720, whether it is for compacting or to relieve stresses. However, in some rare special cases, the welder will perceive when that is necessary or not.
- 5.º) There is NO need to remove the slag formed between the layers of deposited material of the MAGNA electrodes (except for the aluminium electrodes). They already remove the impurities of the welded area, during welding.
- 6.º) After the total welding, we can initiate the process of adjustment of the welded areas with the welding trimming, through turbine/assembled end or other type of abrasive method.
- 7.º) When welding with the electrode MAGNA 720, the molecular fusion between the deposited material and the welding base material will occur (GM-241, GM-246-M or GM-238) and consequently *the welded area will remain with the hardness of the base material*, within a tolerance of \pm 1 or -1 Rockwell "C", as long as the base material has its hardness between 41 and 52 Rockwell "C".
- 8.º) When comparing the two procedures, we conclude that, when welding with just an electrode layer MAGNA 720, the amount of deposited material needed, and consequently the time to weld will be less than in the two-layer procedure, with the electrodes MAGNA 770 and 480 (or 440). However, the hardness of the welded area will decrease.
- 9.º) Recommendation of amperage to welding, as a reference:
 - Electrode **MAGNA 720**, electrode diameter of \varnothing 1/8" or 3,2 mm.
Machine DC (Direct Current)= 60 – 100 Amps.
Machine AC (Alternating Current)= 65 – 100 Amps.

Note: The fine adjustment must be done according to each situation and the welder's experience.

TYPE OF PROCEDURE	HARDNESS	EFFICIENCY	WORK/COST
1 layer of Electrode MAGNA 720	41 – 52 RC	240 mm/Kg	LOWER
2 layers of Electrodes MAGNA 770 and MAGNA 480 or 440	64 RC	160 mm/Kg	HIGHER

Made by: Luiz França

Date: 09/01/03 – Revised on: 14/01/03

Page 4/4

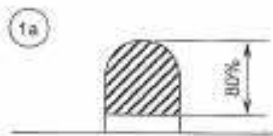


MAINTENANCE AND IMPROVEMENTS OF THE
STAMPING TOOLS – S. J. TOOLS
WELDING PROCEDURES



**PROCEDURES TO MAKE BRIDLE FLANGES
WITH ELECTRODES MAGNA 100, 770 and 480 (or) 440**

PREPARATION OF THE TOOL DEPENDING IF THERE IS AN ANTERIOR FLANGE OR NOT



Remove 80% of the flange height, by trimming through an abrasive process (attrition abrasive disc).

1b

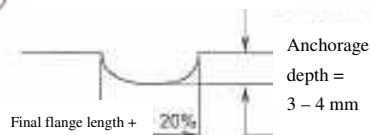
If there is no anterior flange, mark the place where it will be built and trim the anchorage depth, by following step 2

2



Remove the remaining existing flange (20%) and trim the "anchorage" fissure (depth between 3 to 4 mm and length until 20% bigger than the flange final length), with chamfer electrode MAGNA 100 Ø 1/8".

3



The steps 1 and 2 can be made together, if the trimming is through mechanical or manual machining. **Cut abrasive discs can NOT be used to the carbon base.**

ATTENTION

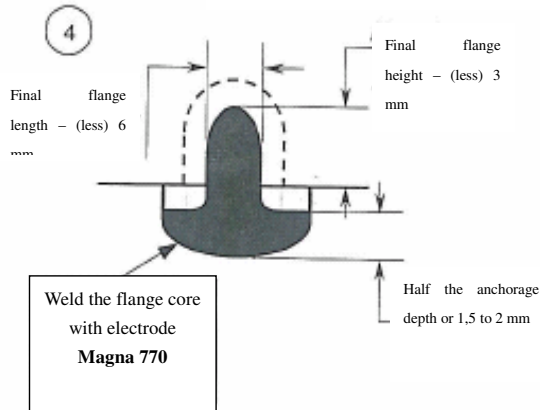
The use of cut discs to make the anchorage fissure is not allowed, because those disks are, in most times, made of carbon and they release carbon molecules into the fissure, which after receiving the welding layer MAGNA, become iron carbides, very hard particles that jeopardize the efficiency of the welded layer. It is also not possible to use graphite electrodes to perform that operation.

In addition to the use of the electrode MAGNA 100, we can machine the fissure with a cut tool, rotary file or aluminium oxide grindstones, whose particles are removed as dirt, during welding process.

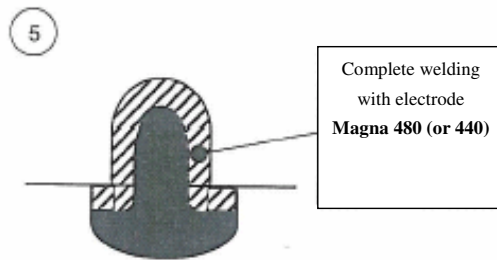


**PROCEDURES TO MAKE BRIDLE FLANGES
WITH ELECTRODES MAGNA 100, 770 and 480 (or) 440**

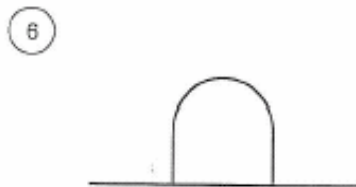
WELDING WITH MAGNA ELECTRODES



Weld the flange core, leaving 3 mm less than the final flange dimensions, with the electrode **MAGNA 770** Ø 4,0 mm.



Complete the welding with the electrode **MAGNA 480 (or) 440** Ø 3,2 mm, by adding welding to the final adjustments.



Finish the flange, according to normal procedure.



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



**PROCEDURES TO MAKE BRIDLE FLANGES
WITH ELECTRODES MAGNA 100, 770 and 480 (or) 440**

The MAGNA electrodes indicated in this procedure are:

Electrode MAGNA 100C, where the letter C indicates the electrode diameter of \varnothing 1/8" or 3,2 mm, number GMB (kardex) 99150000544;

Electrode MAGNA 770B (or 440), where the letter B indicates the electrode diameter of \varnothing 5/32" or 4,0 mm, number GMB (kardex) 99150000543;

Electrode MAGNA 480A (or 440), where the letter A indicates the electrode diameter of \varnothing 1/8" or 3,2 mm, number GMB (kardex) 99150000681;

Some relevant information:

- 1.º) The MAGNA electrodes do NOT need to be stored in a greenhouse. They do not absorb humidity.
- 2.º) Before welding with MAGNA electrodes, one shall NOT pre-heat the cast iron.
- 3.º) There is NO need to hammer the material deposited with the MAGNA electrodes, whether it is for compacting or to relieve stresses. However, in some cases (less than 2%), when using the MAGNA 770, the structure and the composition of the cast iron and its level of contamination with sand, oil and time (useful life) can determine that need. When welding, the welder will perceive that need.
- 4.º) There is NO need to remove the slag formed between the layers of deposited material of the MAGNA electrodes (except for the aluminium electrodes). They already remove the impurities of the welded area, during welding.
- 5.º) After the welding of the pad with the electrode MAGNA 770, there is NO need to make any kind of trimming, before applying the layer of MAGNA 480 (or 440).
- 6.º) After the total welding, we can initiate the process of adjustment of the welded areas with the welding trimming, through turbine/assembled end or other type of abrasive method.
- 7.º) After welding with the electrodes MAGNA 770 and MAGNA 480 (or 440), according to that procedure, the flange area must remain with hardness superior to 720 Brinell, equivalent to 64 Rockwell "C".
- 8.º) Recommendation of amperage to welding, as a reference:
 - Electrode **MAGNA 100**, electrode diameter of \varnothing 1/8" or 3,2 mm.
Minimum Amperage = 250 Amps. – Maximum Amperage = 350 Amps.
 - Electrode **MAGNA 770**, electrode diameter of \varnothing 5/32" or 4,0 mm.
Machine CC (Direct Current) or CA (Alternating Current) = 90 – 140 Amps.
 - Electrode **MAGNA 480 (or 440)**, electrode diameter of \varnothing 1/8" or 3,2 mm.
Minimum Amperage = 80 Amps. – Maximum Amperage = 100 Amps.

Note: The fine adjustment must be done according to each situation and the welder's experience.



**PROCEDURES TO MAKE BRIDLE FLANGES
WITH ELECTRODES MAGNA 100 and 720**

PREPARATION OF THE TOOL DEPENDING IF THERE IS AN ANTERIOR FLANGE OR NOT

1a



Removal through trimming with abrasive disc or machining

2



Removal with electrode **Magna 100**

Anchorage depth = 3 – 4 mm

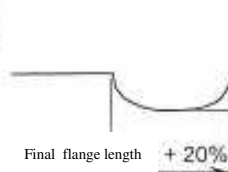
1b

If there is no anterior flange, mark the place where it will be built and trim the anchorage depth, by following step

2

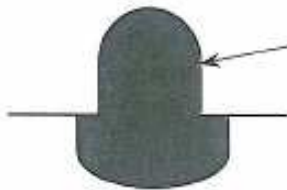
Follow the steps 1a, 1b, 2 and 3, according to the procedure, to weld with two layers. See page 1/5.

3



Anchorage depth = 3 – 4 mm

4



Totally weld the flange with electrode **Magna 720**

Weld the anchorage shoulder and the flange with the electrode **MAGNA 720** Ø 3,2 mm, by adding welding to the final adjustments.

5



Finish the flange, according to the normal procedure.



MAINTENANCE AND IMPROVEMENTS OF THE STAMPING
TOOLS – S. J. TOOLS
WELDING PROCEDURES



**PROCEDURES TO MAKE BRIDLE FLANGES
WITH ELECTRODES MAGNA 100 and 720**

The MAGNA electrodes indicated in this procedure are:

Electrode MAGNA 100C, where the letter C indicates the electrode diameter of \varnothing 1/8" or 3,2 mm, number GMB (kardex) 99150000544;

Electrode MAGNA 720B, where the letter B indicates the electrode diameter of \varnothing 1/8" or 4,0 mm, number GMB (kardex) 991500004570;

Some relevant information:

- 1.º) The MAGNA electrodes do NOT need to be stored in a greenhouse. They do not absorb humidity.
- 2.º) Before welding with MAGNA electrodes, one shall NOT pre-heat the cast iron.
- 3.º) In 99,9% of the cases, there is NO need to hammer the material deposited with the electrode MAGNA 720, whether it is for compacting or to relieve stresses. However, in some rare, special cases, the welder will perceive that need.
- 4.º) There is NO need to remove the slag formed between the layers of deposited material of the MAGNA electrodes (except for the aluminium electrodes). They already remove the impurities of the welded area, during welding.
- 5.º) After the total welding, we can initiate the process of adjustment of the welded areas with the welding trimming, through turbine/assembled end or other type of abrasive method.
- 6.º) When welding with the electrode MAGNA 720, the molecular fusion between the deposited material and the welding base material will occur (GM-241, GM-246-M or GM-238) and consequently *the welded area will remain with the hardness of the base material*, within a tolerance of \pm 1 or -1 Rockwell "C", as long as the base material has its hardness between 41 and 52 Rockwell "C".
- 7.º) When comparing the two procedures, we conclude that, when welding with just an electrode layer MAGNA 720, the amount of deposited material needed, and consequently the time to weld will be less than in the two-layer procedure, with the electrodes MAGNA 770 and 480 (or 440). However, the hardness of the welded area will decrease.
- 8.º) Recommendation of Amperage to welding, as a reference:
 - Electrode **MAGNA 100**, electrode diameter of \varnothing 1/8" or 3,2 mm.
Minimum Amperage = 250 Amps. – Maximum Amperage = 350 Amps.
 - Electrode **MAGNA 720**, electrode diameter of \varnothing 1/8" or 3,2 mm.
Machine CC (Direct Current)= 60 – 100 Amps.
Machine CA (Alternating Current)= 65 – 100 Amps.

Note: The fine adjustment must be done according to each situation and to the welder's experience.