



Cylindrical or polygonal Cage Making equipment

# Gam **HS**

# Gam **HS CONIC**

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# Gam HS

## UNIVERSAL CAGE MAKING MACHINE

Cage making machines belonging to the **GAM HS** Series, are designed for production of **pile and square cages of various shapes and sizes**.

The technology of the **GAM HS** Series is based on the winding of a continuous **offcoil spiral** around the longitudinal rebars by mean of a traveling welding robot station.

This plant offers **productivity** and **quality** of finished products having a very **compact lay-out** and therefore being suitable to be installed within a limited footprint.



## WE SAVE COSTS

The **GAM HS** operate through a very simple production cycle. The **set-up time** required in between the production of two different cages, especially when having different sizes, is **significantly reduced**.

**High productivity** is guaranteed with **one operator only**.

The extremely **compact lay-out** of the **GAM HS** eases the installation of this machine in whatsoever production area contributing in **cost reduction**.

# Leading solutions

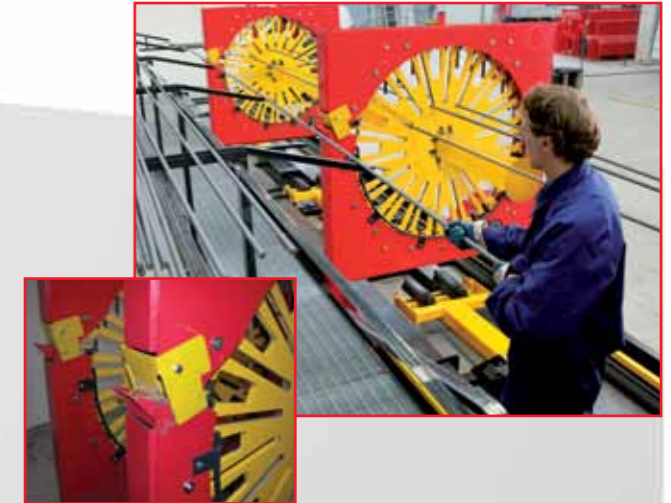
New concepts have been introduced with the **GAM HS**, so that the whole production process of cages has been **simplified** as well as "fine tuned" in specific aspects. The whole **manufacturing cycle is now fast as never before**, for this type of product.

## THE MOBILE HEAD: THE CENTER OF THE PROCESS

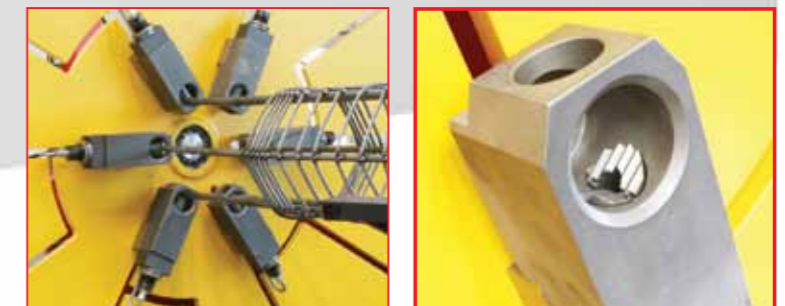
The **GAM HS** plant is based on the concept of the "mobile heads" supporting and driving the rotation of the longitudinal bars, while the welding robot moves along the forming cage. The "Master Head" hosts the **forming ring** where bushes are fixed to make a perfect and precise **template** where the longitudinal bars can be positioned **according to whatsoever cage size and design**.

## PREPARATION TIME REDUCED

The **fast loading of longitudinal bars** is made from the machine side by introducing them in the slots of the mobile heads. **Efforts of the operator are very limited**.



The bars, pushed through the forming ring bushes, are brought to the fixed head where locking is provided by **hydraulically driven clamps**. Clamps are unlocked when cage production is complete.



# Reduced set up times

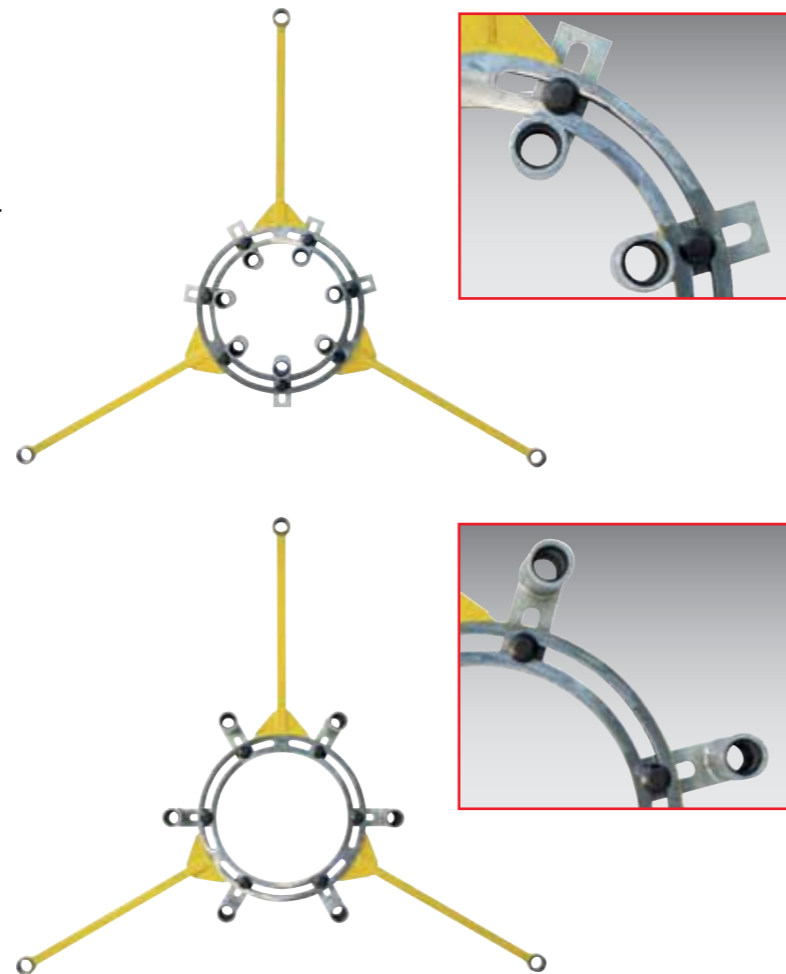
The unique design allows for **quick replacement of bushings** templates/jigs, cutting down the preparation times required **between cages of different types**.

## INFINITE POSSIBILITIES

The **bushes** can be **positioned and fixed** either inside or outside of the template. The position can be adjusted radially in order to create **many different settings**, depending on the different dimensions of the cage.

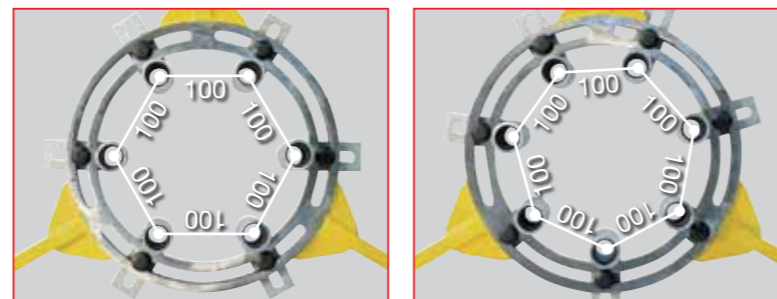


Circular templates for the production of cylindrical cages.



## ODD OR EVEN

The forming ring system allows to produce cages indifferently having **odd or even** number of longitudinal bars. It is always possible to set the forming ring so that, as required by **international design norms**, the **distance between each longitudinal bar** will be exactly the same.



## AUTOMATIC SETTINGS



The operator can place the **right number of longitudinals around the cage circumference** according to the production specification, by using the **GAM HS** control panel special functions.

A **dedicated device** helps to establish the **exact position of each bush** on the forming ring so speeding up the whole preparation of the machine for production.

## CUSTOMIZED SOLUTIONS

As option, special detachable bushes can be supplied in order to mount the **longitudinal bars** bent at the end, the so called "crank rebar". Special bushes for mounting of "**double longitudinal**" are also available.



# Welding under control



A latest generation welding robot, executes the work in full control of the process at each spot. Cages of unparalleled quality in welding assembling is guaranteed.



## WE COUNT THE BARS

The machine is equipped with a device counting each bar and establishing its exact position to perfectly synchronize the welding robot. Also when manufacturing a double longitudinal cage the system always allows to weld properly, exactly at the right spot.



## NO LIMITS PITCH



Cages can be produced with spiral starting at 100 mm only from the end, with fixed or variable pitch.

The pitch can be adjusted with no limitation, rather can be even reduce to zero in putting in direct contact two loops and welding them to each other in continuous configuration.

## WE ADJUST THE WELDING



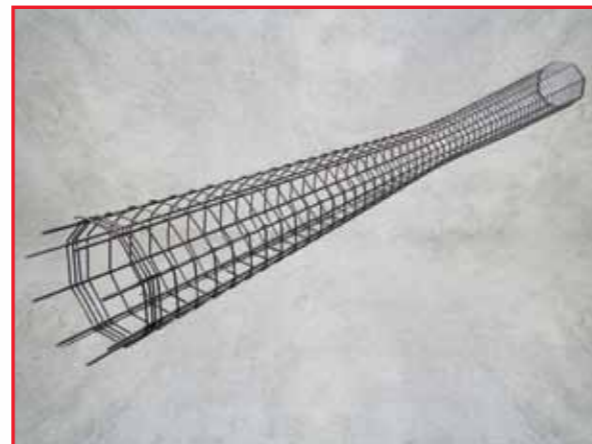
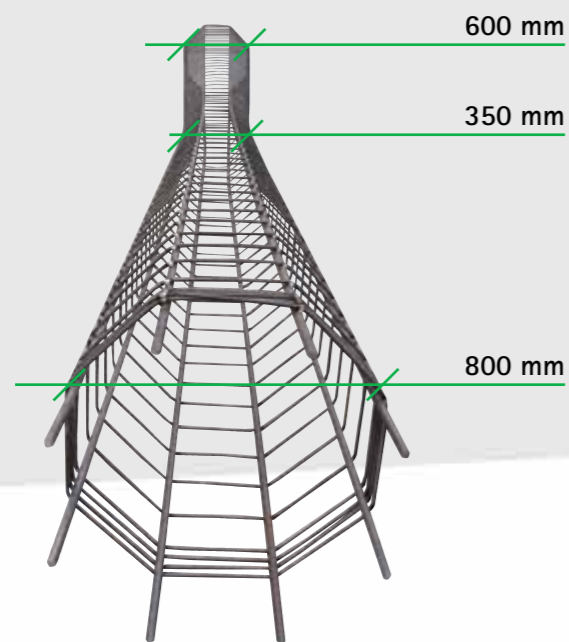
With the **GAM HS** and its dedicated Control Panel, it is possible to manage and control all parameters of welding, including the basic ones such as the minimum welding time which is established depending of the sizes to be welded.

# Gam HS CONIC

The **GAM HS Conic** cage assembling machines are particularly designed for production of **conic cages**, as well as **cylindrical and polygonal** of various shapes and sizes.

The method of production consists always in the welding of a **wire spiral** all around a set of longitudinal bars positioned in a per-defined geometry.

The machine offers **compact design with limited footprint**, **productivity** and outstanding **quality** of the finished product.



Exclusive solutions for unparalleled productivity

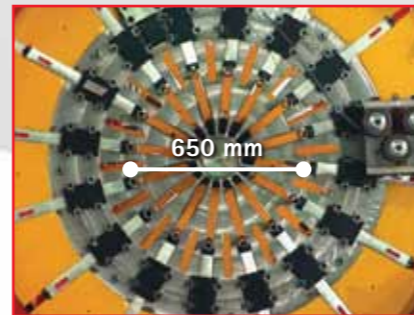
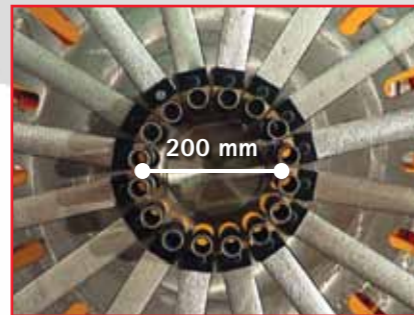
## FIXED HEAD

The **fixed head** is equipped with **hydraulic grippers** able to automatically **lock and unlock the longitudinal bars** at the start of cage production and at the end of it, before evacuation of the finished product



## CIRCUMFERENCE AUTOMATIC CONTROL

The **Mobile Master Head** is equipped with an exclusive device designed to radially **position the bushes**, by mean of an **automatic control**, according to any configuration, size and cage design. Furthermore this automated system allows to modify the positioning of the bushes and therefore **the diameter of the cage**, during the **production/welding cycle** so to obtain **conic cages**.



## ON-LINE STRAIGHTENING AND CUTTING

The straightening and cutting machines belonging to the **RF and RH Series** can straighten an cut wire up to length of 12m. They can be perfectly integrated with a management and working station based on the **GAM HS** or the **GAM HS Conic**. (OPTIONAL)



# SYNCHRONIZED AUTOMATISMS FOR CONSTANT QUALITY

The whole production cycle is controlled by a sophisticated automation system that guarantees an outstanding **quality of the finished product**.

All fixed and mobile heads are perfectly synchronized as the rotation speed depends of the cage design and of the required parameters for welding.

The Control Panel can program and manage also the production of cages designed with **inner reinforcing rings** (stiffeners) which are to be mounted and welded manually.

The machine can "hold" the automatic welding process at **the right time and at the right position** in order to let the operator to fix the ring and then **re-start the auto-mode production in a fast and simple manner**.



The automatic cycle also provides for the management of the **cage support system**. Completed the construction, the operator lowers the devices that support the cage to allow the unloading.



## WORLD SYSTEM: TOTAL CONTROL










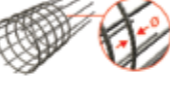
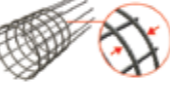


• **MEP Industrial PC "World System" operator control panel is comprised of:**

- LCD screen for the user friendly visualization of all data.
- Compact, ("embedded") microprocessor with low power consumption.
- Input/output and control axes electronic card with protection against short circuit and overload.

• **The software specially developed by MEP allows:**

- Programming of all the production data for the cage.
- Storing of produced cages data.
- Semi-automatic set up of tooling jigs. Give the size of the cage (diameter of the pole, longitudinal bars diam., spiral wire diam., number of longitudinal bars) the software shows the operator which template to use and the mounting position of the longitudinal bars' bushings (GAM HS).
- Automatic bushings positioning (GAM HS Conic).
- Control of all the parameters of the machine.
- "Active Diagnostic" for a constant monitoring of the efficiency of all the devices in the plant.
- Programming of cages with paired bars (GAM HS).
- Programming type of welding. For each section you can indicate whether the weld must be continuous (every intersection between longitudinal and spiral), or alternate (every 2 crossings, 3...).
- Programming spiral pitch.
- Intermediate stops (ie placing of reinforcement rings).

## TECHNICAL AND PRODUCTION CHARACTERISTICS

					
		GAM 1100	GAM 1500	GAM 2000	GAM HS Conic
	<b>CAGE LENGHT</b>				
	minimum	2400 mm - 96"	2400 mm - 96"	2400 mm - 96"	on request
	maximum	12000 - 21000 mm 39'-4" - 69' -7"	12000 - 24000 mm 39'-4" - 78'9"	12000 - 24000 mm 39'-4" - 78'9"	on request
	<b>CYLINDRICAL CAGE DIAMETER</b>				
	minimum with automatic welding	200 mm* - 8"	200 mm* - 8"	400 mm - 8"	on request
	minimum with manual welding	100 mm* - 4"	100 mm* - 4"	100 mm* - 4"	on request
	maximum (other sizes upon request)	1100 mm - 3'-7 3/8"	1500 mm - 5'	2000 mm - 6'-6"	on request
	<b>CAGE SIDE SQUARE</b>				
	minimum with automatic welding	150 mm - 6"	150 mm - 6"	150 mm - 6"	on request
	maximum (other sizes upon request)	350 mm - 14"	600 mm - 24"	600 mm - 24"	on request
	<b>DIAMETER LONGITUDINAL BARS</b>				
	min/max diameter of longitudinal bars: cylindrical cage	Ø 8 - Ø 32 mm #2 - #10	Ø 8 - Ø 40 mm #2 - #11	from Ø 10 - Ø 40 mm #3 - #11	on request
	min/max diameter of longitudinal bars: polygonall cage	Ø 8 - Ø 20 mm #2 - #6	Ø 8 - Ø 20 mm #2 - #6	Ø 10 - Ø 20 mm #3 - #6	on request
	<b>NUMBER OF BARS</b>				
	maximum bars Ø 32 mm -#10 (cylindrical)	26	30	52	on request
	<b>DIAMETER SPIRAL WIRE</b>				
	min/max diameter of longitudinal bars: cylindrical cage	Ø 6 - Ø 16 mm #2 - #5	Ø 6 - Ø 16 mm #2 - #5	Ø 6 - Ø 16 mm #2 - #5	on request
	min/max diameter of longitudinal bars: polygonall cage	Ø 6 - Ø 10 mm #2 - #3	Ø 6 - Ø 12 mm #3 - #4	Ø 6 - Ø 12 mm #3 - #4	on request
	<b>SPIRAL PITCH</b>				
	min/max diameter of longitudinal bars: cylindrical cage	0 - 500 mm 0 - 1'-7"	0 - 500 mm 0 - 1'-7"	0 - 500 mm 0 - 1'-7"	0 - 500 mm 0 - 1'-7"
	min/max diameter of longitudinal bars: polygonall cage	0 - 300 mm 0 - 12"	0 - 300 mm 0 - 12"	0 - 300 mm 0 - 12"	0 - 300 mm 0 - 12"
	<b>WEIGHT CAGE</b>				
	maximum	3200-5600 kg (12-21 m) 7500/12345 lbs (39'-4" - 69' -7")	5000 -10000 kg (12-24 m) 11000/22000 lbs (39'-4" - 78'9")	7500-13000 kg (12-24m) 16535/28660 lbs (39'-4" - 78'9")	on request
	<b>NUMBER OF TEMPLATE RINGS</b>				
	standard (other sizes upon request)	9 (300 - 1100) 9 (12" - 3'-7 3/8")	12 (300 - 1500) 12 (12" - 5')	16 (400 - 2000) 16 (12" - 6'-6")	no

THE PLANT REQUIRES THE USE OF AN AIR COMPRESSOR.

\* 100 / 200 mm - 4" / 8" special tool (optional)

Note: #2 = 1/4" ; #3 = 3/8" ; #4 = 1/2" ; #5 = 5/8" ; #6 = 3/4" ; #10 = 1-1/4" ; #11 = 1-3/8"5



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