Rambaldi + Co.I.T. Srl is a company that has operated in their field of machines and equipment for injection moulding of plastic materials since 1984, and has concentrated all its efforts to improve its products and services offered to customers. In 1992 it started a collaboration with a Spanish company called CRONOPLAST, manufacturer of the Babyplast injection moulding machine, and together they agreed to develop and expand on applications and products in the field of MICRO INJECTION MOULDING of thermo plastics.

International production and operational results show that the table-top Babyplast, is now the undisputed world leader in its field. This is demonstrated by its outstanding performance in the following areas:

- Economical production of both small and large batches.
- Continuous production of components using techno-polymers.
- Prototype development.
- Laboratory testing.
- Technical training.

Rambaldi + Co.I.T Srl, who deals with the commercialisation of the machine, have used their knowledge to cover a whole range of complementary services, from the study of the product, mould construction and development, to the supply of samples and preliminary production batches, thus offering their customers an all round service.

Rambaldi + Co.I.T Srl also offers all the accessories necessary to obtain the maximum productivity: dryers, workbenches, chillers, loaders, sprue separators, standard mould parts for babyplast moulds etc.

We can surely guarantee that we maintain three significant differences compared to other manufacturers of micro-injection machines:

We are the PIONEERS in the creation of automatic workbench size injection machines (we presented, as unique, this technology during the exhibition K’92 in Düsseldorf).

We offer an INTEGRATED SERVICE, based on a team of technicians with many years of experience in mould construction and development, not to mention the injection of techno-polymers.

We have gained a vast experience in micro-moulding with more than 10,000 moulds constructed, all over the world, for our machines and to process plastic materials that range from PP-PA-ABS to PC-PBT-POM-PPS, from filled materials to thermo-rubbers, from ceramics to sintered metals.
**Babyplast 6/10**

*Babyplast 6/10P* is the fruit of the experience gained from the thousands of applications matured in medical - electronic - micro-engineering fields and from years of research and development in the field of *MICRO-INJECTION* of thermoplastic materials, ceramics and waxes for micro-fusion.

The results achieved on world markets of our table top machine *Babyplast*, together with the continued and constant developments in performance and applications, have brought it to be a leader in its field taking on the challenge to satisfy the demands of such an ample area.

The new electronics controlled by two powerful microprocessors, widens and improves the field of application of *Babyplast 6/10P* and increases its characteristics:

- Easy to operate with the possibility to memorise up to 100 production cycles.
- Cost saving mould construction thanks to the particular concept of its platens.
- The injection group can be moved off centre. 5 piston sizes from 3 to 15 cm³ Pressure settings from 2650 to 815 bar.
- PID temperature control with the possibility to control mould and hot runner (230V) temperature.
- Proportional hydraulics – Silenced motor / pump assembly.
- Output sockets for auxiliaries, controlled by the microprocessor – PC interface
- Cooling circuit (5 zone) controlled by microprocessor (Optional)
- Monitoring of injection position and mould closure by linear transducers.
- Quality control.

All of this maintaining the same basic structure and not forgetting the concept of simplicity which has been a major contribution to defining it as a forerunner in micro-injection moulding machines.
Advantages with Babyplast

☑ QUALITY of PARTS PRODUCED

☑ LOW PRODUCTION COSTS

☑ SMALL INVESTMENT NEEDED FOR MOULDS
QUALITY OF PARTS PRODUCED

☑ Moulds with a low number of cavities
  Dimensional precision easy to obtain. Thanks to the low running costs, it is possible to be competitive even using moulds with a low number of cavities.

☑ Layout of cavities easily balanced
  It is easier to balance moulds with a small number of cavities and allows to reduce the sprue size.

☑ Homogenous mould temperature
  Thanks to temperature control directly on cavity plate.

☑ Plastification of resin without stress due to friction.
  Thanks to the unique plastification system using spheres, the temperature of the plastification cylinder is homogenous and each granule of plastic is melted by contact on hot metal. In this way, the resin is not overheated by friction.

☑ Low residence times in the injection unit.
  Thanks to the reduced dimensions of the plastification chamber (15cm³), the material remains for a short time at the melting temperature even in cases of small shot sizes of less than a gramme.
LOW PRODUCTION COSTS

☑ Low power consumption
Maximum power consumption Only 3 KW, Inverter for motor speed control. Power consumption during cycle from 1,5 to 2,5 Kw

☑ Reduced times for mould and material change
Each cavity plate is fixed by two screws and centred on the machine platens. Material and colour change with approximately 100/150gr

☑ Low sprue/part ratio
Injection directly into the cavity plate with consequent reduction of the sprue. Average weight of sprue for 4 cavities : 0,6gr

☑ Low consumption for mould temperature control
Mould dimensions reduced to cavity plate with consequent reduction in time and energy needed (cooling/heating) to reach and maintain the correct temperature for the mould.

☑ A complete production cell in only 1m² of space.
Thanks to its compact size (1x0,6m), it is possible to have a complete production cell (machine – chiller – loader – sprue separator - robot) in less than 1m².

☑ Flexibility in high production.
By dividing the production over more machines, in case of problems, only a part of the production stops. It is possible to produce batches of different colours simultaneously. Starting with small production quantities, it is possible to increase production by replicating machine / mould.
Small investment needed for moulds

- **Moulds with low number of cavities**
  Thanks to the low running cost of the machine (approx. 1.5 to 2 €/h) it is possible to obtain low production costs even with moulds which have a low number of cavities. Above all with technical parts where the cost to make the cavity is very high, (core pulls etc.). The saving in the reduction of the number of cavities is very important for reducing costs.

- **Construction of the cavity plate only**
  Thanks to the particular concept of the machine platens (they act as bolsters) only the cavity plate needs to be made.

- **Mini hotrunners with upto 16 tips**
  Due to the vast number of applications using babyplast, some major manufacturers of hotrunners (Hasco – Ewikon – Thermoplay) have developed mini hotrunners, especially for Babyplast, with upto 16 tips. In some cases, thanks to a special machine nozzle, it is possible to inject directly into the part without using a hotrunner.

- **Mini mould blanks**
  Hasco produce a range of standard mould blanks for Babyplast moulds, in various grades of steel, where it is only necessary to make the cavity. This helps reduce time and costs in mould construction.
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Piston diameter (mm.):</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
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<tbody>
<tr>
<td>Volume (cm³):</td>
<td>4</td>
<td>6.5</td>
<td>9</td>
<td>12</td>
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<tr>
<td>Injection pressure (Kg/cm²)</td>
<td>2.650</td>
<td>1.830</td>
<td>1.340</td>
<td>1.030</td>
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<tr>
<td>Clamping force:</td>
<td>6.250 Kg/cm²</td>
<td>62.5 KN</td>
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<tr>
<td>Opening force:</td>
<td>400 Kg</td>
<td>4 KN</td>
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<tr>
<td>Opening stroke:</td>
<td>30 - 110 mm</td>
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<tr>
<td>Ejection force:</td>
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<td>5 KN</td>
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<td>Ejection stroke:</td>
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<td>Hydraulic pressure:</td>
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<td>Oil tank capacity:</td>
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<td>Dry cycle:</td>
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<tr>
<td>Power:</td>
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<tr>
<td>Power supply:</td>
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<td></td>
<td>3 ~ 400V, 50/60 Hz. + Neutral + earth</td>
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</tbody>
</table>
Drawing to show mould assembly mounted in Babyplast machine

- Clamp piston
- Ejector plate
- Ejector piston
- Moving platen
- Fixed mould half
- Moving mould half
- Fixed platen
The machine platens act as bolsters

The injection point can be moved off centre

Grub screws to centre moving half

Injection unit can be moved 25mm off centre

Grub screws to centre fixed half
Baby mould
75x75mm -
Traditional mould
156x156mm
BABYPLAST MOULD DIMENSIONS
MACHINE PLATEN DIMENSIONS

- Moving Mould Half
- Ejector Travel
- Nozzle Travel

Distance:
A = APPROX. 50mm
B = APPROX. 60mm
BABYPLAST
Moulds

8 cavities with slides and injection via a hotrunner - mat. PA6

4 cavities with slides mat. PA 66

1 cavity with slides mat. ABS
BABYPLAST Moulds

10 cavities with slides mat. PA 6

4 cavities with slides mat. POM
BABYPLAST Moulds

2 cavities with 4 slides mat. PP

3 cavities with Ewikon multi-tip hot-runner mat. PP

2 cavities with slides mat. POM
Mould with 4 slides - 1 cavity - Injection with Ewikon hot tip - Mat. PC
Mould with 4 slides - 2 cavity Mat: PP
Mould with unscrew system
2 cavities
Mat: PA
Mould 64 cavities
Mat: POM
Nozzle for spray

24,000 pcs/h
BABYPLAST
Standard Mould Parts
Condizioni generali / Premesse

In linea generale sono state definite le seguenti condizioni:

- Un pezzo utilizzabile per scopo pubblicitario globale con grammatura molto limitata e rendimento pratico.
- Stampo a più impronte con iniezione diretta e senza matecorza
- Produzione con una pressa Babyplast perché facilmente gestibile, con ridotta necessità di periferiche e minima occupazione di spazio, adatta proprio per l’impiego in occasione di fiere e seminari.
- Massima produttività e brevissimi tempi ciclo (forzato <10s)

Partner nella progettazione

Studio di progettazione Hein GmbH

Sviluppo del prodotto con Sistema di calcolo FEM, simulazione di stampaggio e calcolo del ritiro, progettazione dello stampo

HASCO

Sistema a Canale Caldo, normalizzati dello stampo, Costruzione dello stampo, Campionatura presso la scuola interna

Babyplast, H. Christmann

Pressa di iniezione

ISK GmbH

Raffreddamento con CO2

Linde Gas

Fornitore del gas

Barlog Plastics GmbH

Fornitore del materiale plastico

Dicronie U.T.E. Pohl

Rivestimento dei componenti dello stampo

Simulazione-Stampaggio

Sviluppo-Prodotto (Alexander Hein) e Progettazione-Stampo presso lo Studio di Progettazione Hein GmbH

Progettazione-Stampo
Sistema a Canale Caldo H7000/…

- Per lo stampaggio a molte impronte, senza materoza di pezzi piccoli e molto piccoli su uno spazio estremamente limitato.
- Disponibile a magazzino come sistema Standard a 4, 8 e 16 punti di iniezione. Distanza tra le punte di soli 8, 10 e 20 mm. Nello stampo per la graffette si sono 10 mm di interasse tra le punte.
- Lo minimo dimensioni di ingombro del sistema a canale caldo ne permettono il montaggio in stampi con dimensioni esterne a partire da 750x106 mm.
- Utilizzo universale di normallizziata della HASCO per gli stampi molto piccoli per Mini-Press, come distributori a canale caldo standard con anche bussola di iniezione opzionale ed attacchi rapidi per piccoli stampi.
- Uguali rapporto di pressione in ogni punto di iniezione grazie al bilanciamento geometrico dell’intero sistema.
- La tenuta ermetica piatta dalla calotta intorno alla punta compensa la dilatazione termica radiale del distributore ed evita le tensioni che eventualmente si presentano in caso di dilatazione termica.
- La superficie con minimo carica di pressione riduce le forze di portanza. La presenza di poco materiale nella zona della calotta facilita il cambio di materiale.
- La tolleranza molto strette per il punto di iniezione e la lunghezza permettono di eseguire un posizionamento preciso dalla punta sul punto di iniezione e quindi garantisce un minimo diametro di iniezione, a partire da ca. 0.4 mm.
- Le punte sono prodotte con un lega speciale di molibdeno che, insieme ad una buona conducibilità termica, presentano anche un elevata resistenza all’usura.
- Una adeguata potenzialità termica, su tutta la lunghezza del distributor, garantisce un profilo termico omogeneo ed una temperatura costante lungo tutto il percorso di scorrimento ed in tutte le punte.
- Elementi di supporto in titano riducono al minimo la perdita di calore dovuto alla conduzione termica nello stampo.
Costruzione dello stampo ad iniezione nel Reparto Produzioni Speciali HASCO

- Precisi lavori di elettroerosione a filo ed a tuffo.
- Determinazione precisa dei profili per un articolo privo al 100% di bave.
- Creazione precisa di margini di soli 0,5mm di spessore sul profilo.
- Creazione adeguata dei lardoni di estrazione determinati dal profilo.
- Minimo attrito nelle guide delle guance per ridurre le forze di sforzo ed apertura grazie all’utilizzo di un innovativo rivestimento in dinorite.
- Dalla progettazione del prodotto fino alla campionatura: 12 settimane - Costruzione stampo: 5 settimane.

Campionatura presso la Scuola Tecnica della HASCO

- Messa in funzione dello stampo su una pressa Babyplast.
- Collegamento e regolazione del condizionamento ISK con CO2.
- Ottimizzazione della geometria del pezzo sulla base del comportamento di sforzo e della rigidità presso il reparto Produzione Speciale HASCO.
- Rivestimento delle cavità’ per uno sforzo migliore del pezzo.
- Seconda campionatura presso la Scuola Tecnica della HASCO alla presenza di tutti i partner della progettazione, prova di materiale soddisfacente con PBT, PA12 e ABS.
- Tempo ciclo: 10s
Ewikon hotrunners for Babyplast

2-4-6 tips
Ewikon
Hotrunners
for Babyplast

2-4-6 tips

EWIKON
Heißkanalsysteme
GmbH & Co.KG

babyplast®
Injection directly into part

Profile for nozzle with Ewikon tip

(art. RB.008 PEW)
Babyplast nozzle with static mixer

Machine Nozzle with static mixer art. 100.6656400
Venturi loader
Art. RB600 VHV
For all types of materials in granular form – compact, size and low weight. Suitable for clean rooms.

Material loader
Art. RB600 VH
Loader for materials in granular form 250x150x60cm.

Dehumidifier
Art. RB602 TCE
Capacities 2 l - max temp. 180°C Complete with venturi loader and adapter for Babyplast.

Electrical cabinet
Cod. RB602 VA
Electrical cabinet – C/F, equipped with machine.

Spray remover
Cod. RB600 PM
Pneumatic with bell for removing sprays - 200 V 50 Hz.

Temperature controller
Cod. RB602 TR
Pressure and water temperature controller - Max. temp. 50°C - 230V/50/60Hz - 30W.

Spray separator
Cod. RB606 SH
Spray separator for Babyplast - 230V 50W - 63x0/300mm.

Bench
Cod. RB602 BA
Aluminum bench with integral supports designed to take chiller or mold cabinet 120x1000 x 9000.

Moist cabinet
Cod. RB600 E
Mold cabinet (even hold up to 12 molds) rotating shelves 1000x1000x2000mm.

Chiller
Cod. RB602 N10
Chiller - R134A, Cooling power 4.4 kwhr. Power rating 1.3kW.

Babyplast
Auxiliaries
Babyplast in the USA
Parts produced by Babyplast

PC - POM - PA - PP - ABS
Parts produced by Babyplast

PC - POM - PA - PMMA – PP - ABS
Micro-moulding specialists

babyplast®
Micro-moulding specialists
Education and research on micro/nano manufacturing

Previous and current work

**FIB sputtered NiBe µ-cavity**

**Education:**
- New course “Micro/nano manufacturing” in Spring 04

**Research:**
- Development of micro/nano manufacturing technologies
  (micromolding, micromachining, microwelding...)
- Complement to MRSEC, and PTC, MIC, CIMS centers
- Lab: new Micro/Nano Manufacturing Lab
Education and research on micro/nano manufacturing

New equipment

1. Ferromatik Milacron Babyplast molding machine
2. FEI Strata-201 focused ion beam
3. Sodik K1C microEDM
INTERNATIONAL JOURNALS

Micro-moulding specialists
Parts produced by Babyplast

POM-PA-PP

POM - 4 cavities - surface area 32 cm²

POM - 1 cavity - EWIKON nozzle - 3 tips

PP - 1 cavity - insert loaded by robot

PA6 - 40 cavities
Parts produced by Babyplast

PC-POM-PA-PBT

- **POM** - 4 cavities
  - pz. 0,02 gr

- **PC** - 1 cavity
  - pz. 5,4 gr

- **PC** - 2 cavities
  - pz. 1,1 gr

- **PBT** 30%Fv
  - 2c. 1,3 gr

- **Valox 420**
  - 2,5 gr

- **Pa 66 + 20%fe + 30%fv**
  - pz. 0,1 gr

- **Stanyl** - 3 cavities
  - pz. 1 gr

- **POM** - 1 cavity
  - 1 gr

- **PBT 20% Fv**
  - 1 cavity
  - 6 gr
Parts produced by Babyplast

PC-POM-PA-PBT

POM - 6 V cavities

PEEK - 2 cavities

PP 8 cavities

PS - 8 cavities

PP 32 cavities
Parts produced by Babyplast
PC - POM - PA - PP - ABS
Parts produced by Babyplast

PC - POM - PA - PP
- ABS - PP
If you need to produce a part that weighs from 0,01 g. to a maximum of 15 g, we have a real winner as an alternative: *BABYPLAST* 6/10

With more than 10,000 applications used on the Babyplast machine, that include the use of the most varied thermoplastics, various types of moulds, we are able to put at the disposal of the customer our experience, that has no equal in the field of micro injection moulding.

The majority of the moulds developed for Babyplast are not for preliminary production or prototypes, but for full production.

The materials used, range from PP-PS-PE-ABS-PA to PC-POM-PBT-PPS-PPO-LCP, from thermo rubbers to filled materials, from ceramics to sintered metals.

Moulds have been developed with up to four slides, single and multi tips with up to four tips, and as many as 40 cavities in one single mould.

Babyplast is mainly used in technical fields: Electronics - automotive – micro-mechanics - medical - furniture, but it is also used by manufacturers of toys – promotional products - cosmetics – costume jewellery.
Babyplast production unit
Installation of the UAI injection unit onto a Babyplast machine
Installation of the UAI injection unit onto a Babyplast machine.
Installation of the UAI injection unit onto a Babyplast machine

PPS + TPU
Babyplast with robot application
<table>
<thead>
<tr>
<th>Electronics</th>
<th>Laboratories</th>
<th>Automotive</th>
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<tbody>
<tr>
<td>Babyplast 6/10</td>
<td>Communication</td>
<td>Micromechanics</td>
</tr>
<tr>
<td>BTicino spa</td>
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<tr>
<td>Drennan (Fishing tackle)</td>
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<td>Columbian Chemicals co.</td>
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