



## QUESTIONNAIRE ON HPDC COMPANIES IN RELATION TO PLANTS FEATURES AND QUALITY CONTROL

### PRESENTATION

Assomet is the association gathering the Italian companies engaged in the production and transformation of non-ferrous metal and it represents the productive chain of aluminum and light metals, copper, lead, zinc and precious metals, from primary production to recycling and transformation (wrought products and castings).

Assomet is a partner of the European Research Project MUSIC, taking care of the dissemination of its achieved scientific results.

The MUSIC Project – *MULTI-layers control&cognitive System to drive metal and plastic production line for Injected Components* – funded by the European Commission within the Seventh Framework Program considers that the application of modern tools and control software to a productive technology influenced by several interconnected variables, as it is for non-ferrous metal die casting, can provide great opportunities for a productive improvement.

The methodology and the tools set up during the MUSIC project for the real-time monitoring of the complex factors that are necessary for a quality casting production, if integrated in the current practices of the die-casting foundries, will be able to dramatically support the competitiveness of this sector, that could be otherwise relegated to a marginal role in comparison to the dominant leadership of the Eastern countries.

This short questionnaire will allow to collect quantitative information that will be useful to better understand the quality requirements and to define the necessary route to be followed to reach such results. This is particularly true as far as small companies are concerned, since they are largely representative in the foundry sector.

The scientific results of the MUSIC Project will be presented during the HTDC 2016 – High Tech Die Casting event that will take place in Venice on 22<sup>nd</sup> and 23<sup>rd</sup> June 2016, once they will be put at free disposal of all the foundries of the European Union.

### MUSIC Project Partners





## QUESTIONNAIRE ON HPDC COMPANIES IN RELATION TO PLANTS FEATURES AND QUALITY CONTROL

To be sent back no later than February 29<sup>th</sup>, 2016 to Assomet Servizi  
(e-mail [info@assomet.it](mailto:info@assomet.it), fax 0039 02 66146599),  
or to be filled in electronically on the MUSIC Project web-site:  
<https://music.eucoord.com/Survey/body.pe>

The questionnaire has to be filled in anonymously<sup>1</sup>.

- (1) The productive plant is located in (in case of more plants, please fill in more questionnaires): (010)
- France
  - Germany
  - Italy
  - Poland
  - Spain
  - Other Country ..... (please specify)
- (2) Number of employees (people stably working in the company):
- From 1 to 10 (021)
  - From 11 to 20 (022)
  - From 21 to 50 (023)
  - From 51 to 100 (024)
  - From 101 to 250 (025)
  - Over 250 (026)
- (3) Company turnover (per year)
- Up to 5 mln € (031)
  - Over 5 and up to 15 mln € (032)
  - Over 15 and up to 50 mln € (033)
  - Over 50 and up to 100 mln € (034)
  - Over 100 mln € (035)
- (4) Apart from high pressure die casting, which casting processes are used in the foundry?
- Sand casting (041)
  - Gravity casting (042)
  - Low pressure die casting (043)
  - Rheocasting (044)
  - Vacural (045)
- Other casting and forming techniques (please specify)
- ..... (046)
  - ..... (047)

<sup>1</sup> In accordance to the Italian Legislative Decree 196/2003, in terms of processing of personal data for all the people collaborating in this survey. Assomet Servizi S.r.l. has been appointed as controller in accordance with Article 29 of the Code regarding the protection of personal data and its pro tempore sole director will be responsible for the data management .



(5) High pressure die casting alloys used (please specify the quantity)

- Al ..... tpy (051)
- Zn ..... tpy (052)
- Cu ..... tpy (052)
- Mg ..... tpy (054)
- Other alloys
- ..... tpy (055)
- ..... tpy (056)

(6) High pressure die casting machines in use (in terms of clamping force)

- Up to 200 t n. .... (061)
- From 201 to 500 t n. .... (062)
- From 501 to 800 t n. .... (063)
- From 801 to 1.000 t n. .... (064)
- From 1.001 to 2.000 t n. .... (065)
- Over 2.000 t n. .... (066)
- Total n. ....**

(7) Of the total, the high pressure die casting machines are characterized by:

- Cold chamber n. .... (071)
- Hot chamber n. .... (072)

(8) Of the total, the high pressure die casting machines characterized by the use of robots in automatic or semi-automatic stations are: n. .... (081)

To which operations are the robots dedicated?

- The stations are fully automatic (082)
- Lubrication (083)
- Castings ejection (084)
- Ejection and trimming (085)
- Size and quality control (086)

(9) Of the total, how many high pressure die casting machines are characterized by an in-line control of the process parameters?

- Valve control of the piston speed n. .... (091)
- Multi-point control of the injection curve n. .... (092)
- Closed loop advanced control n. .... (093)

(10) Installation year of the oldest ..... and most recent press ..... (101) (102)

(11) Which are your customers' sectors (please specify the percentage in relation to the turnover)?

- Automotive ..... % (111)
- House-hold appliances ..... % (112)
- Other durable goods ..... % (113)
- Building ..... % (114)
- Mechanics ..... % (115)
- Electric and electronic industry ..... % (116)
- Other (please specify)
- ..... % (117)
- ..... % (118)
- ..... % (119)

**Total 100%**



- (12) The foundry provides
- Only trimmed and deflashed parts (121)  
or on customers' demand also
  - Machined parts (122)
  - Thermally treated parts (123)
  - Coated parts (124)
  - Assembled parts (125)
- (13) Which is castings weight in the current production?
- Minimum weight .....kg (131)
  - Maximum weight .....kg (132)
- (14) Does the foundry have a laboratory for the quality control?
- Yes (141)
  - No (142)
- For which tests?
- Microstructural  Yes  No (142)
  - Mechanical  Yes  No (143)
  - Dimensional  Yes  No (144)
  - Pressure tightness  Yes  No (145)
  - Computer tomography  Yes  No (146)
  - Other ..... (please specify) (147)
- (15) During the last year, which have been the main reasons for scraps production in relation to customers' counterclaims?
- Gas porosity ..... % (151)
  - Inclusions ..... % (152)
  - Solidification shrinkage ..... % (153)
  - Cracks ..... % (154)
  - Filling defects ..... % (155)
  - Metal/die interactions ..... % (156)
- Total 100%**
- (16) Which kind of classification is used for defects?
- ASTM (161)
  - CEN/TR 16949 (162)
  - Customer specification (163)
- (17) Which are the certifications or quality manuals obtained by the foundry?
- ISO 9000 series (171)
  - ISO 14000 (172)
  - ISO 50001 (173)
  - ASTM (174)
  - ASIT SVTI (175)
  - ISO TS 16949 (176)
- Other (please specify)
- ..... (177)
  - ..... (178)