

New Lachaussée s.a.

13, rue du Tige

B-4040 HERSTAL

BELGIUM

tél. 32-4-248.88.11

fax : 32-4-248.88.00

e-mail : mail@lachaussee.com

Web :

<http://www.lachaussee.com>

 **ISO 9001**

 **Automatic machines for
ammunition and pyrotechnic
industries**

 **Worldwide supply**

 **Established in 1830**

DEVELOPMENT FOR AN AUTOMATIC DOSING MACHINE FOR PRIMING COMPOSITIONS

2001 JOINT SERVICES SMALL ARMS SYMPOSIUM

OBJECTIVES - A - FUNCTIONAL

- ☞ PRIMERS IN COMPLIANCE WITH THE NATO SPECIFICATIONS AC 225 D/8, AC 225 D/9, MIL.P.46610E OR ACCORDING TO CUSTOMER'S SPECIFICATIONS;**
- ☞ WEIGH ACCURACY SIMILAR TO MANUAL PROCESS;**
- ☞ DRYING TIME SIMILAR TO MANUAL PROCESS;**
- ☞ LIFE TIME SIMILAR TO MANUAL PROCESS.**

OBJECTIVES - B - INDUSTRIAL

- ☞ MACHINE MUST BE SAFE;**
- ☞ NO MORE PEOPLE HANDLING EXPLOSIVE PASTE;**
- ☞ EASY TO USE;**
- ☞ EASY TO REGULATE;**
- ☞ EASY TO CLEAN;**
- ☞ EASY TO CHECK;**
- ☞ EASY TO ADAPT TO OTHER FORMULAS;**
- ☞ 1,000 DOSINGS PER MINUTE.**

OBJECTIVES - C - ECONOMICAL

- ☞ MACHINE TO BE INTEGRATED INTO EXISTING FILLING LINES;**
- ☞ MACHINE TO ALLOW THE USE OF EXISTING FILLING PLATES;**
- ☞ MACHINE TO USE STANDARD EQUIPMENT;**
- ☞ SIMPLE;**
- ☞ LOW COST ;**
- ☞ LONG LASTING.**

TODAY STATE OF THE ART

A. DRY PROCESS FILLING

- ➡ High quality of primer;
- ➡ Drying of explosives (LTNR, TRNZ);
- ➡ Appropriate buildings;
- ➡ Most dangerous (dust, ...).

B. WET PROCESS FILLING

- ➡ Good quality of primer;
- ➡ Explosives always wet (RH 12%);
- ➡ More safe than the dry process;
- ➡ Lower investment.

C. ELEYPRIME PROCESS

- ➡ Mainly for rimfire case priming;
- ➡ No production of LTNR;
- ➡ Very delicate water drop dispensing.

NEW DOSING SYSTEM

- ➡ Replace the manual dosing operation by an automatic proportioning of the wet priming mixture**
- ➡ Automatic dosing with minimum 3 parameters variables for regulation;**
- ➡ Accuracy and repeatability;**
- ➡ Minimize the waste;**
- ➡ Interfaced with computer appliance.**

PRINCIPLE OF THE DOSING SYSTEM



- ➡ **Dispensing system that provides for applications requiring small volume very accurate; dispensing or dosing without mechanical adjustment;**
- ➡ **This system uses a micro-processor based driving a precision rotary linear actuator;**

DOSING PARAMETERS

- ➡ **Percentage of water in the priming mixture;**
- ➡ **Air pressure applied on the priming mixture;**
- ➡ **Extrusion time;**
- ➡ **Cutting time (dwell);**
- ➡ **Diameter of the extruder;**
- ➡ **Screw pitch;**
- ➡ **Motor speed.**

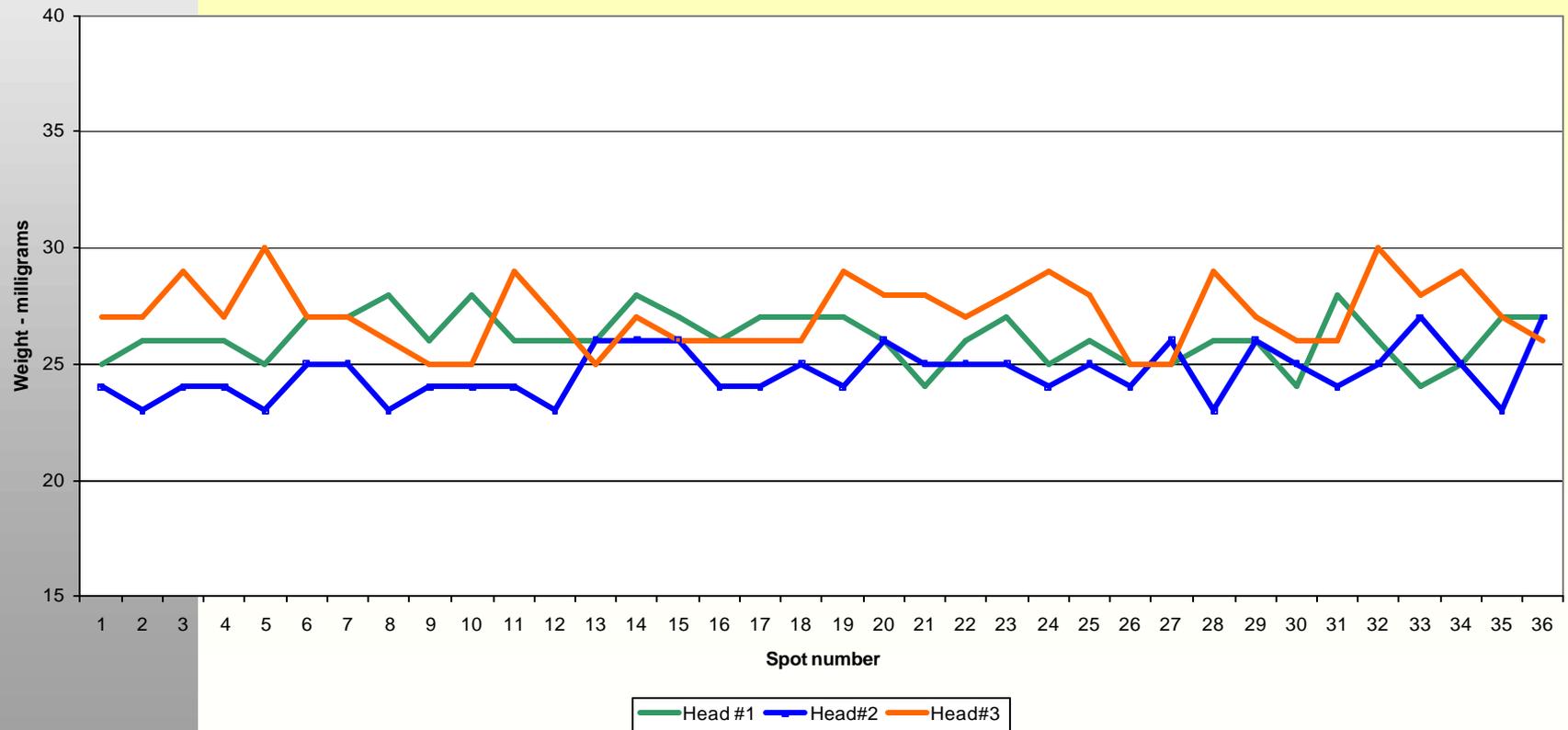
NEW DOSING SYSTEM : RESULTS

- ☞ **DUMMY POWDER**
 - Mean weight : 26.14 mg
 - Standard deviation : 1.08
 - Percentage variation : 4.15 %
 - Accuracy (see curve) : N°2

- ☞ **EXPLOSIVE MIXTURE**
 - Mean weight : 50.4 mg
 - Standard deviation : 2.02
 - Percentage variation : 4.04 %
 - Accuracy (see curve) : N°3

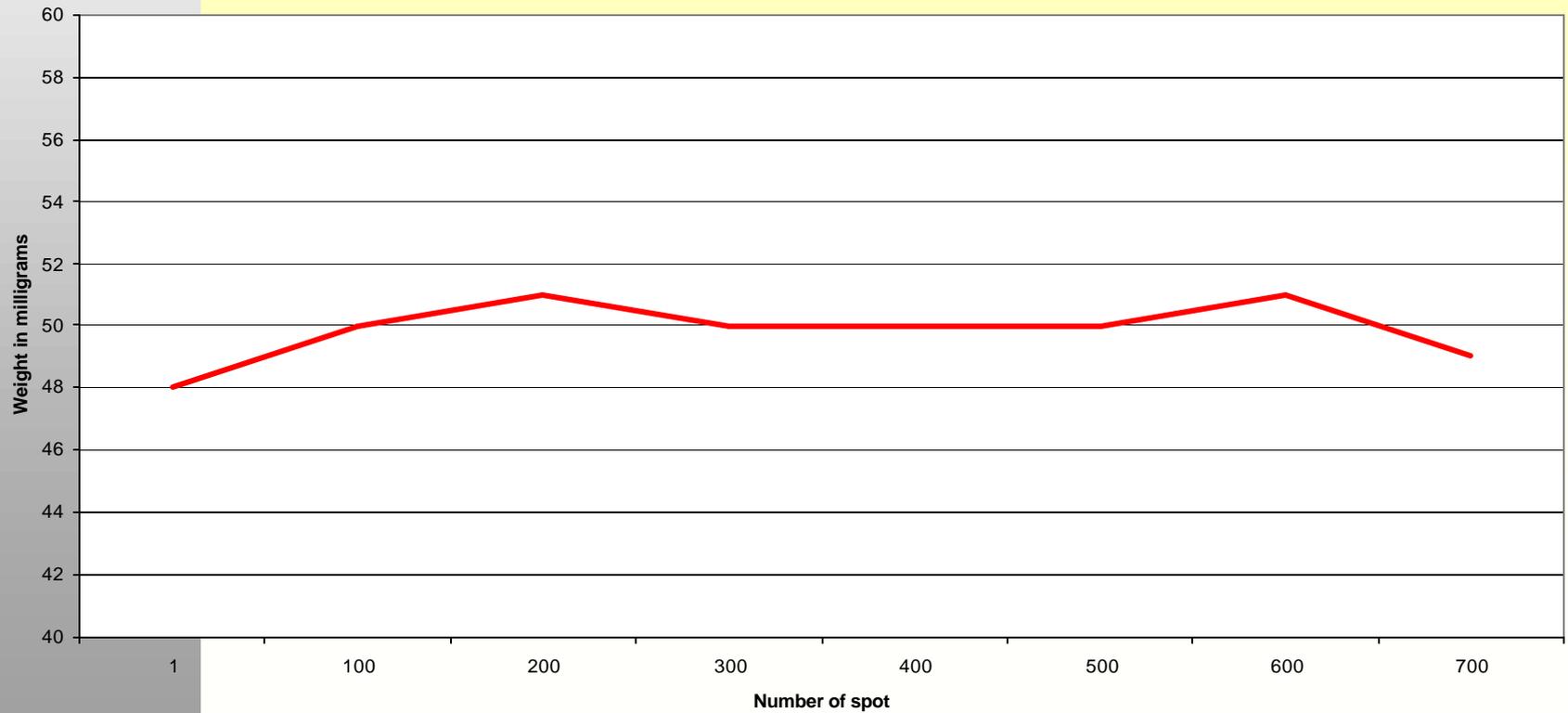
CURVE N°2

WEIGHT - Three dosing heads - Dummy powder



CURVE N°3

One Head dosing - Explosive powder



AUTOMATION POLICY

The automatic machine manufacturer must necessarily follow a strict logic in his preliminary approach.

- ☞ HE MUST BE FAMILIAR WITH THE PROCESS**
- ☞ HE MUST ANTICIPATE CAUSES & EFFECTS**
- ☞ HE MUST LIMIT RISK COMPONENTS**
- ☞ ACCESSIBILITY**
- ☞ INTEGRATION OF 100% INSPECTION IN LINE**

AUTOMATION POLICY

SIMPLIFICATION OF THE PROCESS

- ◆ **reducing the number of operations;**
- ◆ **using standardized equipment;**
- ◆ **appropriate design of special equipment.**

LOW CONVERSION COSTS

- ◆ **flexible equipment;**
- ◆ **adaptable equipment.**

AUTOMATION POLICY

MASS PRODUCTION

- ◆ specialized automatic equipment;
- ◆ standardized assembling;
- ◆ flexibility;
- ◆ minimizing variants;
- ◆ simplifying conversion tools;
- ◆ re-using existing tools.

PROTOTYPE

Different steps

- 1°) 1 dosing motor
- 2°) 3 dosing motors
(photo N°2)
- 3°) 6 dosing motors

Final equipment

- 36 dosing motors
(photo N°4)
- Available in 2002

Photo N°2 : 3 dosing motors

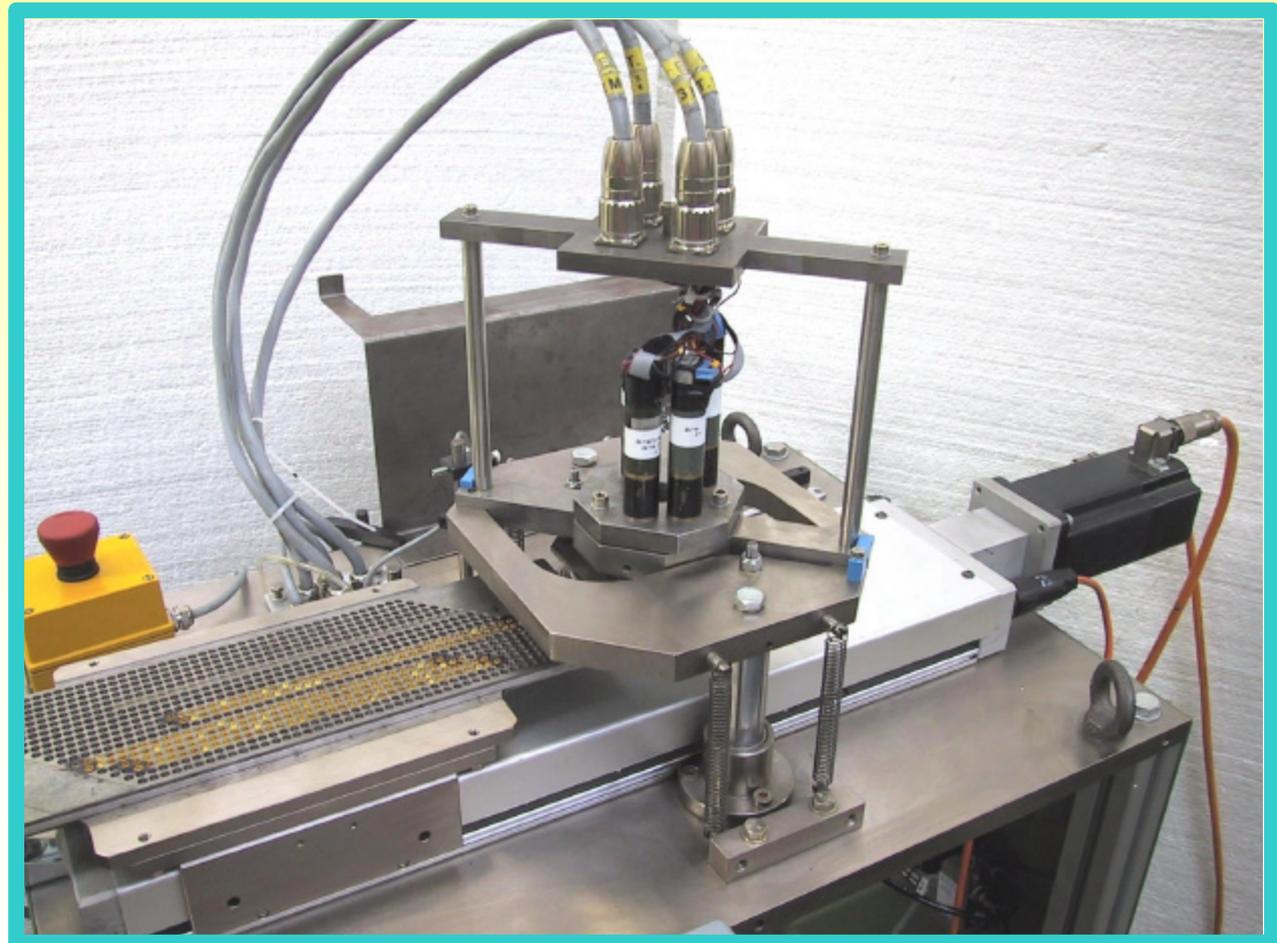


Photo N° 4 : 36 dosing motors

