

FILLING RECOMMENDATIONS



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The EP Spray System can be used with standard aerosol cans either aluminium or tin plate with a 1" opening (25.4 mm). The filling is carried out with specific aerosol filling equipments.

Operations:

1. Valve introduction in the can
2. Crimping and under-cup-gassing (UCG)

Crimping proposal

Caution: these parameters are for information only and parameters can vary according to can executions and manufacturers, diameter, type of the machined neck, filling equipment.

| Can | Cup | Crimping height | Crimping diameter | | |
|---------------------------|-------------|---------------------|-------------------|----------------|-----------------|
| <i>Hc: Contact height</i> | | <i>E: Cup width</i> | | | |
| ALU | Hc: 4.25 mm | ALU | E: 0.42 mm | approx. 5.2 mm | approx. 27.2 mm |
| ALU | Hc: 4.25 mm | TIN | E: 0.28 mm | approx. 5.2 mm | approx. 27.4 mm |
| TIN | Hc: 4.0 mm | ALU | E: 0.42 mm | approx. 5.2 mm | approx. 27.0 mm |
| TIN | Hc: 4.0 mm | TIN | E: 0.28 mm | approx. 5.0 mm | approx. 27.1 mm |

With a 45mm diameter and higher, aluminium cans must have a machined neck. See "machined neck" drawing enclosed.

- Crimping head: 8 segments with 0.8 mm radius.
- Net crimping head pressure: between 75 and 95 kg.
- Quality of air used: no oil, dry air, i.e. below 30% relative humidity at 20°C.

Filling ratio and internal pressure

It is possible to determine the initial pressure taking into account the 60/40% ratio, active product (60%) and air (40%) according to FEA Standards. In any case, the maximum inner pressure of filled can cannot exceed 10 bar at 20°C. For articles compatible with irradiation treatment, the maximum pressure is **8 bars at 20°C** (please consult us for details).

| | | |
|-----------------|---|--------------------|
| <u>Example:</u> | Pressure before product filling: | 3,5 bar |
| | Pressure after product filling: | about 9 bar |

3. Active product filling

Filling needle has been designed for maximum filling speed and corresponds to EP Spray System valve specifications. **See "EPS filling needle" drawing enclosed.**

- **Product injection pressure:** max. 30 bar (head closed)
- **Volume injected:** max. 102 % of specified volume
- **Maximum inner pressure of filled can:** 10 bar at 20°C **)

****) Caution:** this is the maximum pressure for the system. Depending on can specifications and aerosol / product security regulations in force, the maximum pressure may be reduced.

Important

It is important to verify that the dome of the valve is not damaged by the filling needle. Each bag size is designed for a specific can size and bag filling volume.

Controls

We highly recommend the following controls:

- **Before production (set up control)**
- **During production (in process control)**

Pressure control: internal pressure before filling can be checked just after UCG, meaning before product filling and/or after product filling.

Pressure gauge needle has to be the same as EPS filling needle.

Filling volume control: by automatic check weighing. We draw your attention to the fact that the weight of air is insignificant compared to product (approx. 0.3 to 2 gr.). Therefore, control of air presence cannot be done by weighing!

Tightness control: by immersing cans into water during approx. 3 minutes. A repeat of micro-bubbles means a tightness problem.

4. Actuator placement

The actuator can be placed manually or automatically directly after filling station in order to avoid any problem arising from the potential swelling of the internal gasket.

General Information

Storing ranges (before filling)

Temperature: min. 10°C - maxi. 30°C.

Humidity: min. 40% HR - max. 80% HR

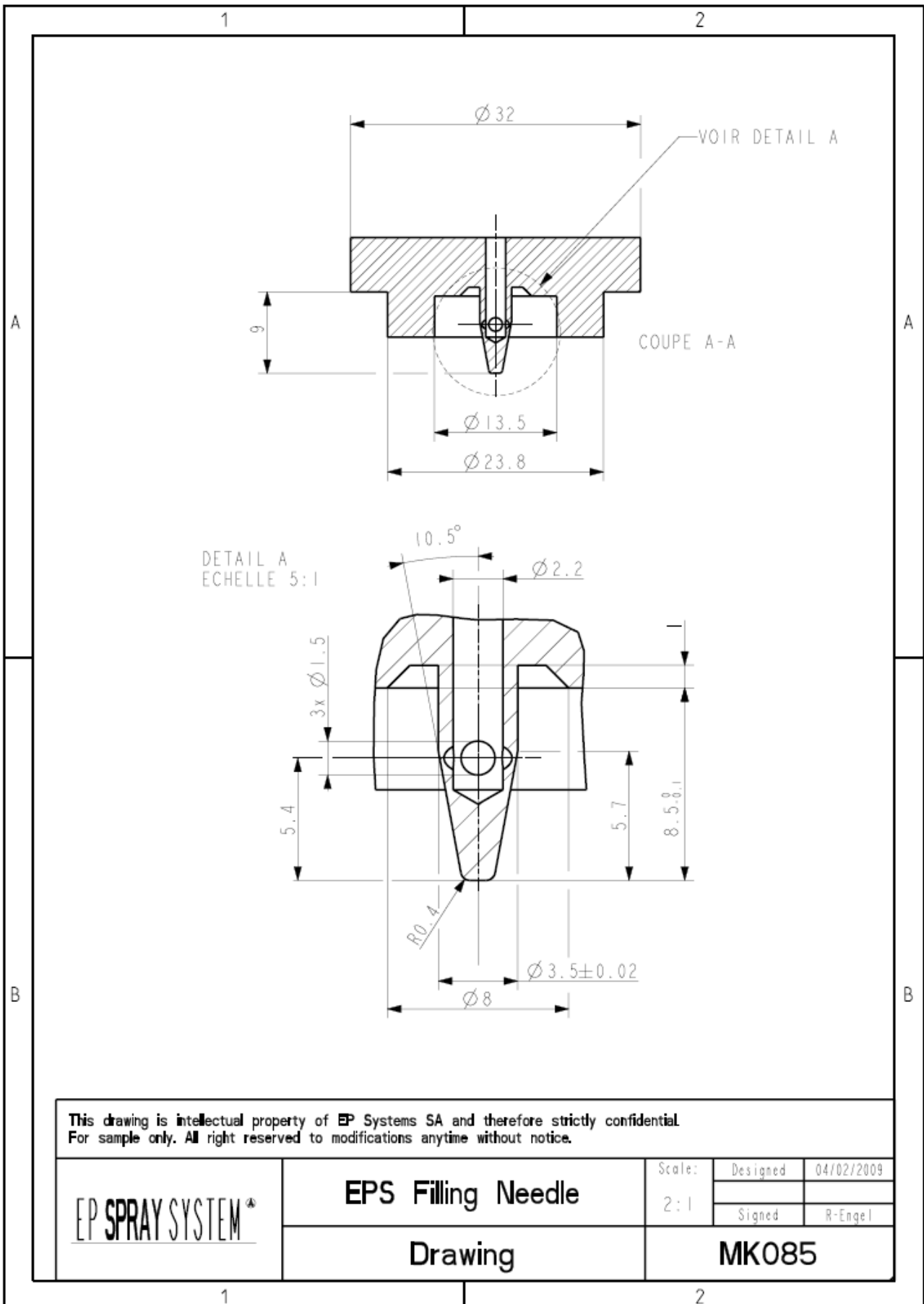
The systems must always be stored in their original packaging.

Irradiation

Only certain items can be irradiated (before filling). Please contact us for information.

THIS EDITION 02/2010 REPLACES AND CANCELS ALL PREVIOUS EDITIONS.

N.B. The warranty covers obvious manufacturing defects and is limited to the free replacement of the faulty spraying systems, all other expenses excluded; there is no warranty for any direct or indirect damage. The warranty ceases to be valid if the spraying systems are modified in any way after having left EPS's factory (EP Systems SA). EPS may not be held liable for the chemical and/or physical interactions between its spraying systems and the chemicals contained in the cans, for the canning/filling operations, for the components and accessories used, as well as for any damage which could result from their use; all the compatibility tests are the sole and full liability of the customer. (See general conditions of sales of EP Systems SA).



This drawing is intellectual property of EP Systems SA and therefore strictly confidential.
For sample only. All right reserved to modifications anytime without notice.

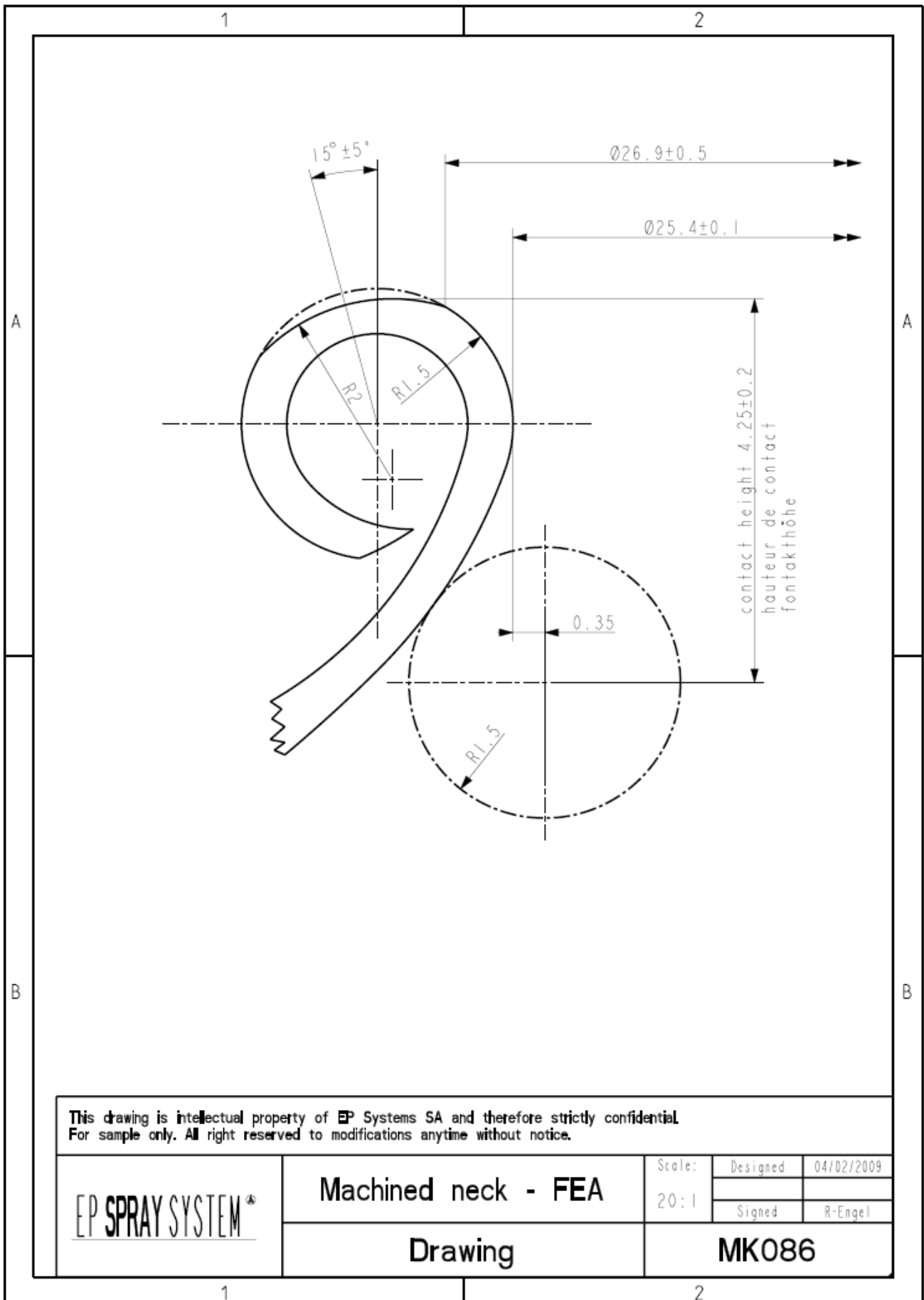
EP SPRAY SYSTEM®

EPS Filling Needle

| | | |
|--------|----------|------------|
| Scale: | Designed | 04/02/2009 |
| 2:1 | Signed | R-Engel |

Drawing

MK085



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EP SPRAY SYSTEM®

Machined neck - FEA

| | | |
|--------|----------|------------|
| Scale: | Designed | 04/02/2009 |
| 20:1 | Signed | R-Engel |

Drawing

MK086