

# Preliminary findings for MSF

Examination of Cepheid MTB cartridge

**Client:** Médecins Sans Frontières

## Agenda:

- 1 Findings
- 2 Preliminary conclusion

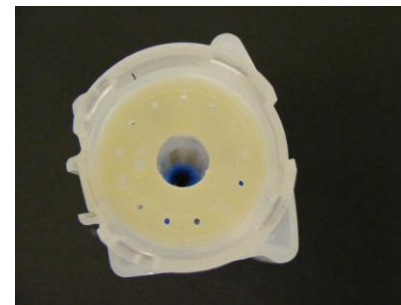
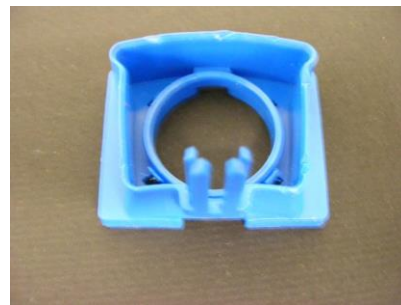
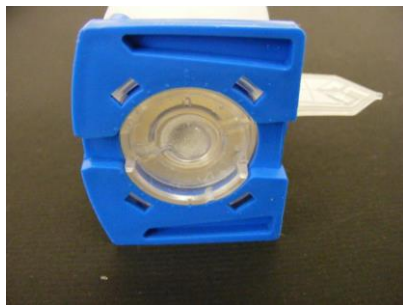
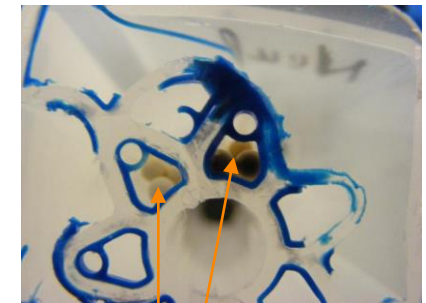
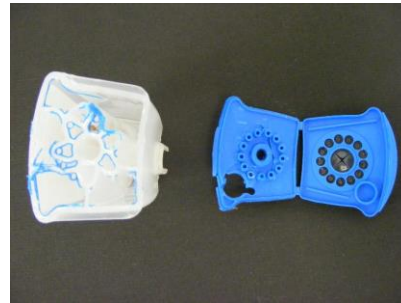
## 1.0 Findings

We examined the packaging of the cartridge:



## 1.1 Findings

We examined the construction of the cartridge:

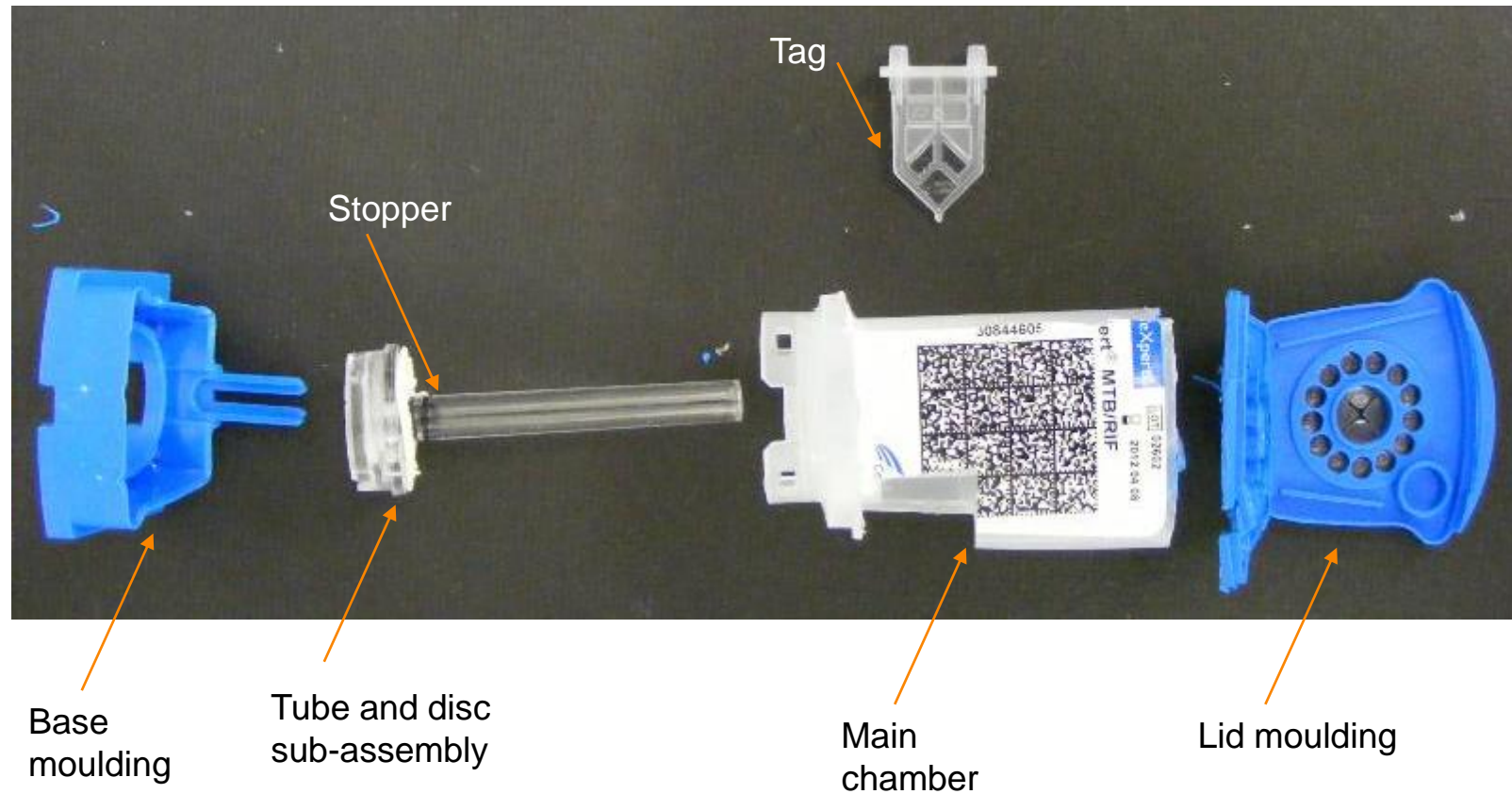


Reagent beads  
packed in two of  
the 6 lumens



## 1.2 Findings

We reviewed the assembly of the cartridge:



## 1.3 Findings

### Summary:

- 5 parts:
  - lid moulding: contains kiss cut membrane (secondary moulding), living hinge, heat sealed / welded to main body
  - main chamber: contains multiple lumens, two packed with reagent beads, TPE gasket (co-moulding)
  - tube and disc sub-assembly: contains an elastomer stopper
  - tag: pegs interface with ports on main chamber
  - base moulding: clips to main chamber
- Secondary moulding processes, filling steps, and heat sealing / welding evident
- The mouldings are complex, and the filling and assembly process steps are not trivial

## 2.0 Preliminary conclusion

### Ball park estimate of unit price:

PCR reagent beads,  
solutions, sample reagent

Foil packaging and  
sealing, label, cardboard  
insert

Contribution to cost of  
development and IP  
portfolio is not included

Quality control, facilities,  
support staff, management  
overheads, supplier audits

cost of mouldings	£3.00	
placeholder for Chemistry	£1.00	
Labelling, pouching, packaging	£0.30	£4.30
Tooling	£0.5m	
Assembly line	£2.0m	
Packaging line	£0.5m	
Development (not included)	£0m	
Volumes p.a.	5m	
Amortisation	3yr	£0.20
subtotal		£4.50
Factory overheads	x2	£9.00
Convert to US dollar	Unit price	\$18.00

Note: Tertiary packaging, transport, duty, and supply costs not factored in.

## 2.1 Preliminary conclusion

**The overheads factor can be estimated from the quoted price of \$17 USD (£8.50)**

- Deduct cost of materials and tooling (£4.50) to find allocation for overheads
- Ratio = 1.89 (= 8.50 / 4.50)
- A typical value for the overheads factor is 2.0, based on our experience in the design, development, tooling, and manufacture of similar products



## 2.2 Preliminary conclusion

### Conclusion

- From our ballpark cost analysis, we conclude that \$17 USD is not unreasonable as a discounted unit price.
- The dominant factor is the overheads. A calculation from a unit price of \$17 shows that the overheads factor is 1.9 which is not unreasonable based on our experience of similar products. A factory audit and full cost analysis would be needed to gain any further insight into the overheads.
- We could investigate the cost of materials and assembly processes in more detail. However it is unlikely that the cost would deviate more than  $\pm 30\%$  of our first estimate (£4.50) and the impact to the unit price would be modest.

**We do not think any further investigation of unit cost is worth pursuing**

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