



Soluções para multiuso e limpadores especiais

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Moving Beyond Clean



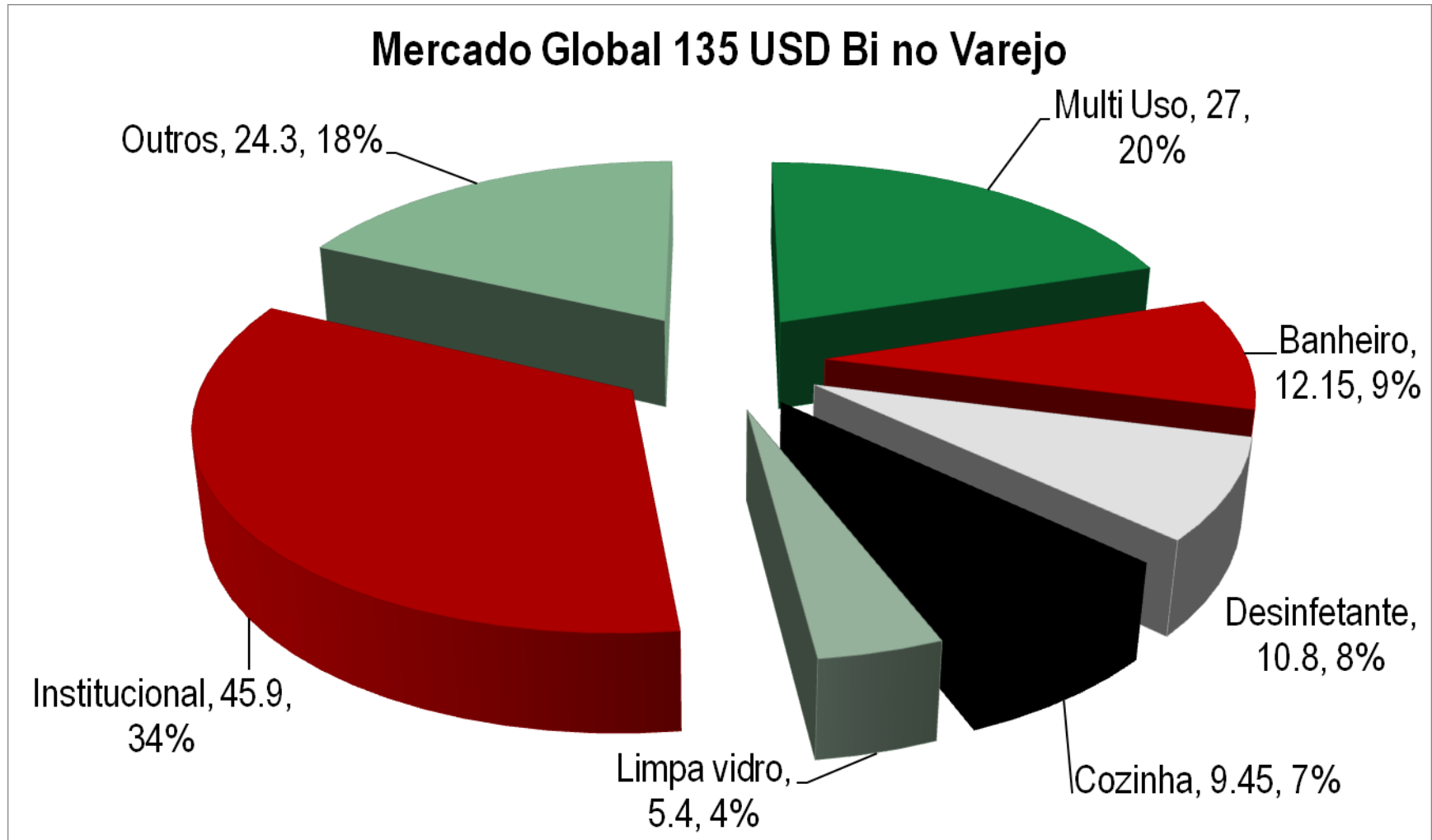


Agenda

- Mercado de limpadores
- Atributos de um limpador
- Eficiência de limpeza de Multiusos
- Modelo de eficiência de limpeza



Mercado de Limpadores



Fonte: Avaliações de mercado F&SC

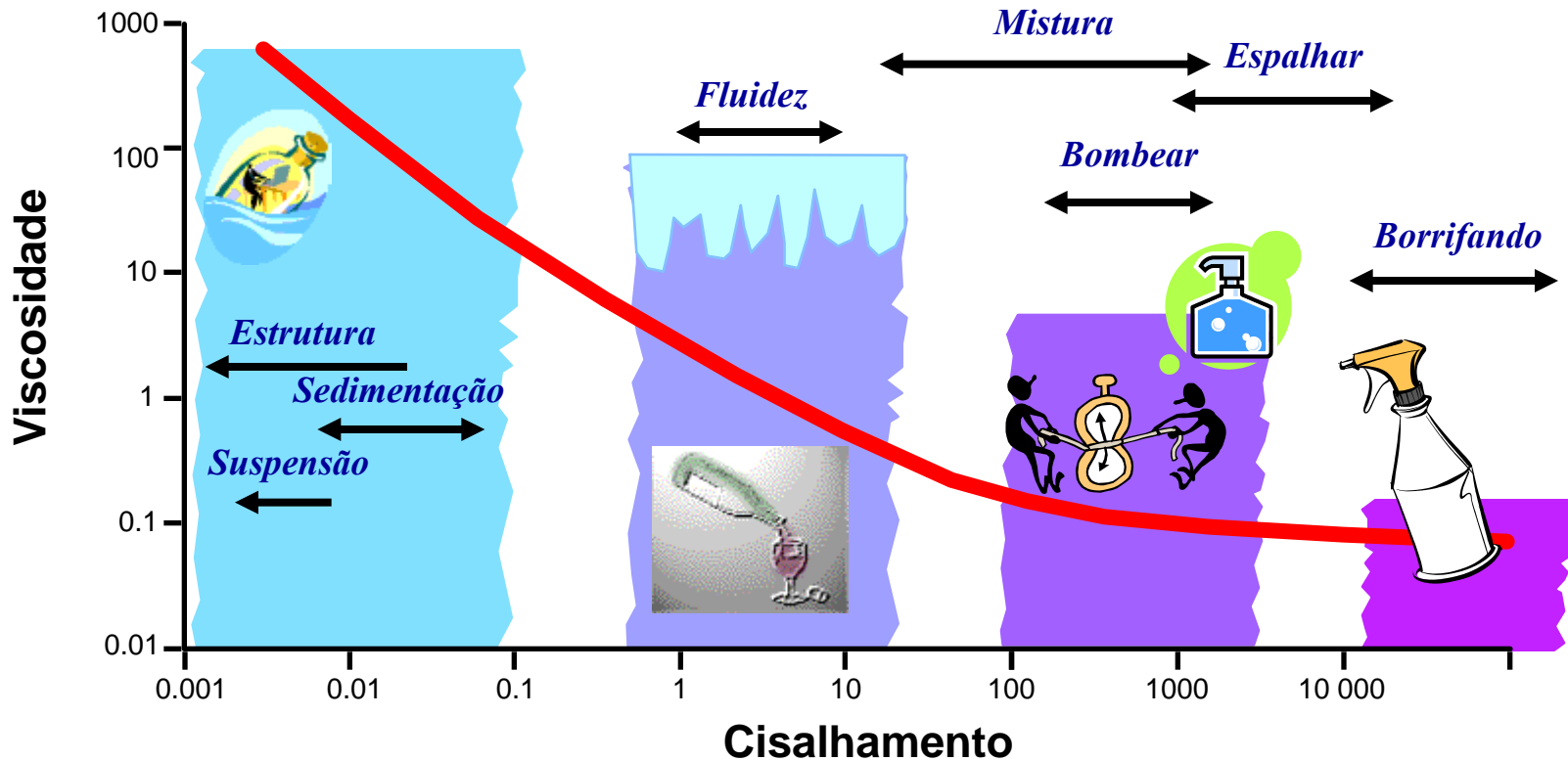


Atributos de um limpador





Atributos de um limpador

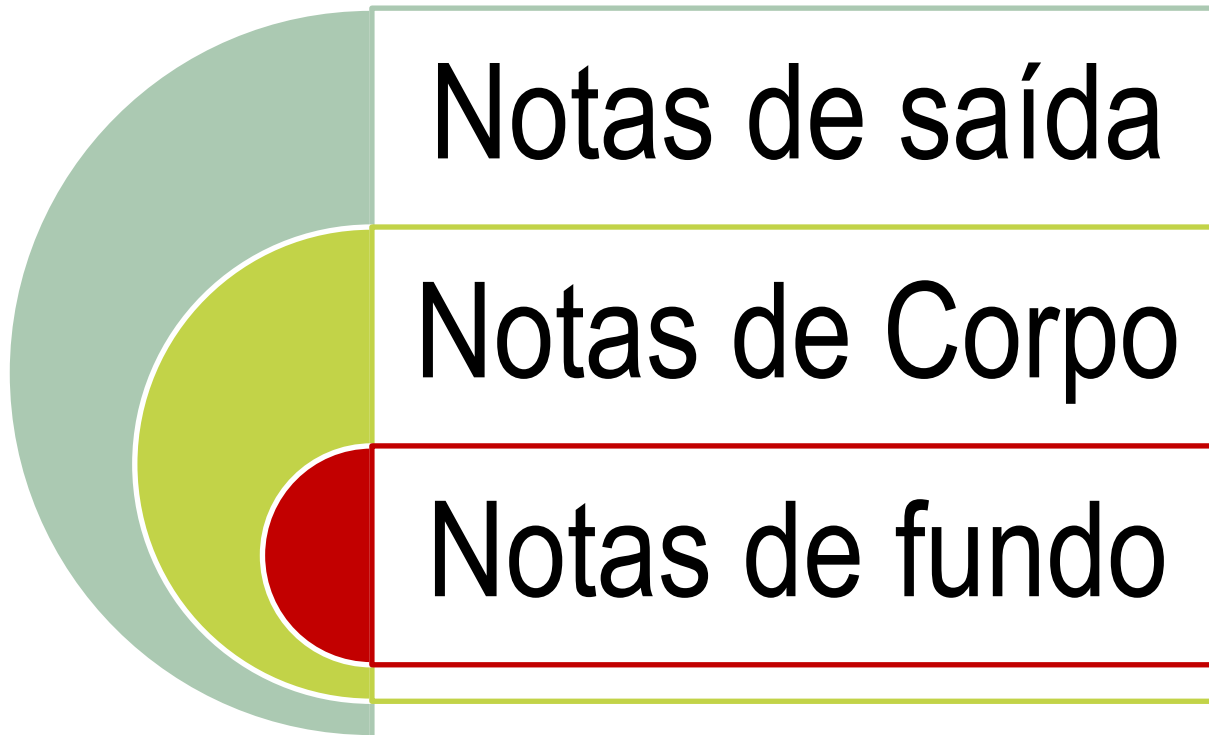


Atributos de um limpador





Atributos de um limpador





Atributos de um limpador



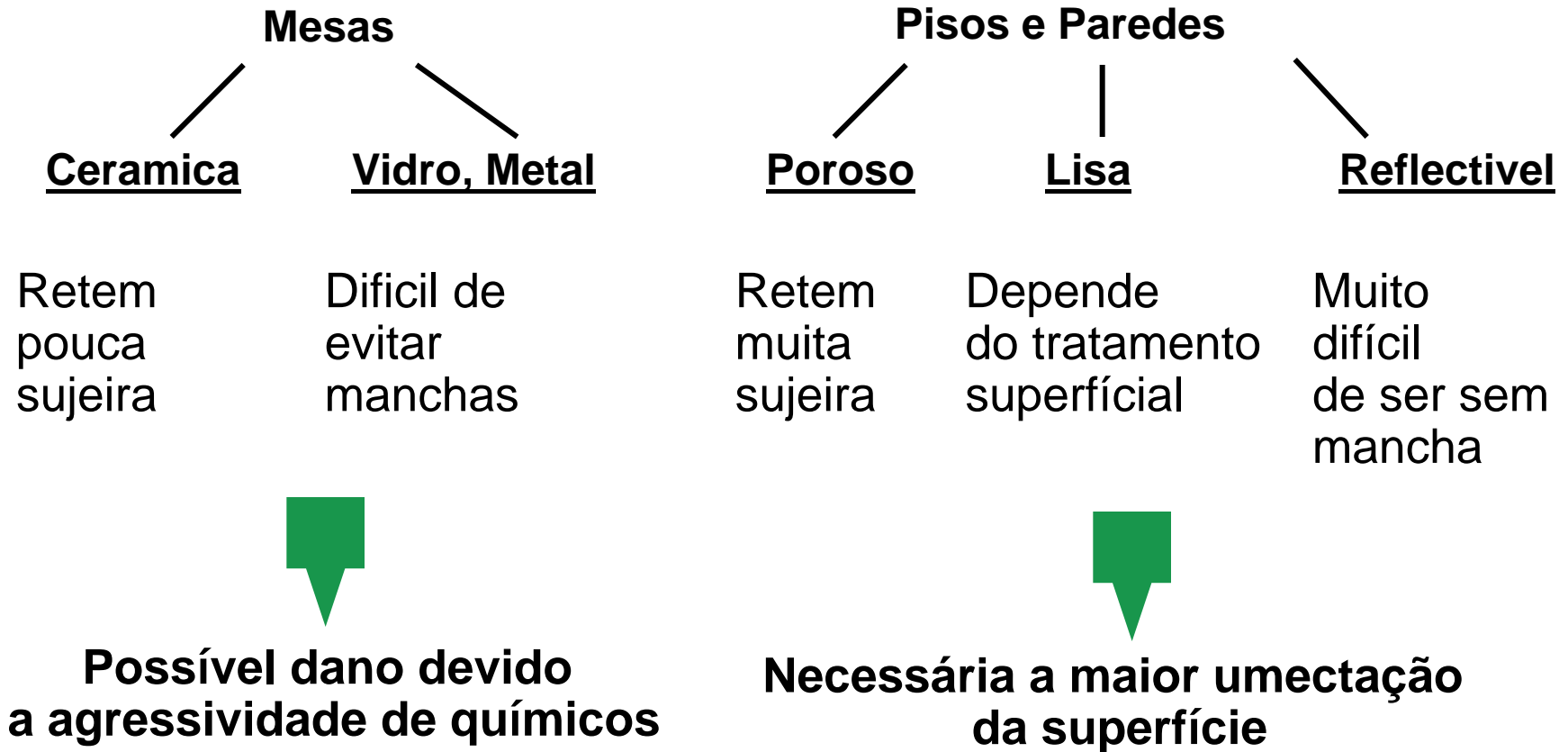


Natureza da sujidade

| Cozinha | Banheiro | Janela | Carpete |
|----------------|-------------------------------------|---------------|---------------------|
| Gordura | Ca ²⁺ , Mg ²⁺ | Sebum | Particulas |
| Proteína | Soap Scum | Particulas | Proteínas |
| Carboidratos | Particulas | Gordura | Carboidratos |
| Particulas | Ferrugem | | Manchas de comida |
| Bactéria | Bactéria | | Resíduos de animais |



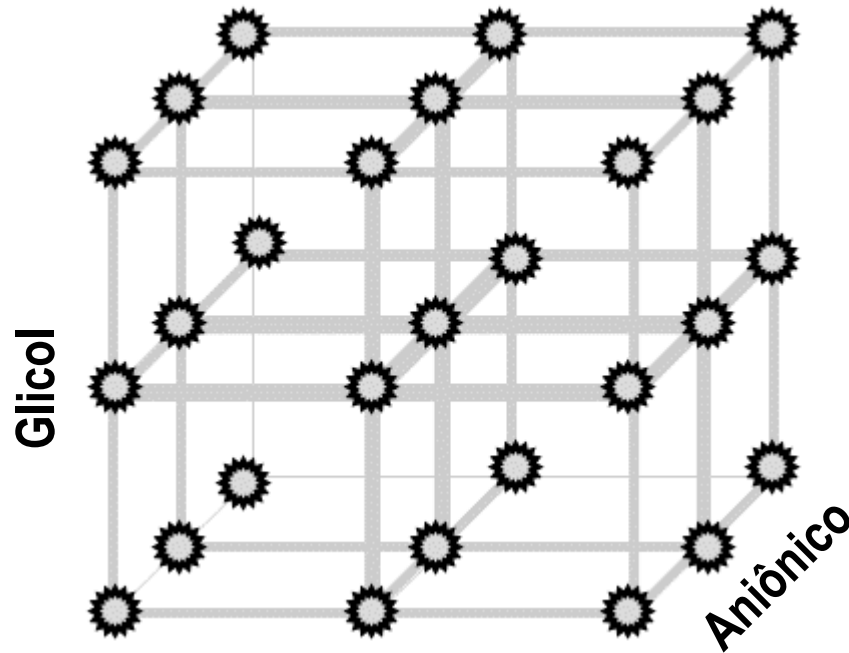
Conhecer a superfície





Planejamento do experimento

- Dowanol PnB
- Dowanol DPM
- ButylCellosolve
- ButylCarbitol



Não Iônico

- Ecosurf SA 7
- Ecosurf SA 9
- Ecosurf EH 6
- Ecosurf EH 9

- LABS
- SLEs

Amostras

~400
formulas

Interações
1º e 2º

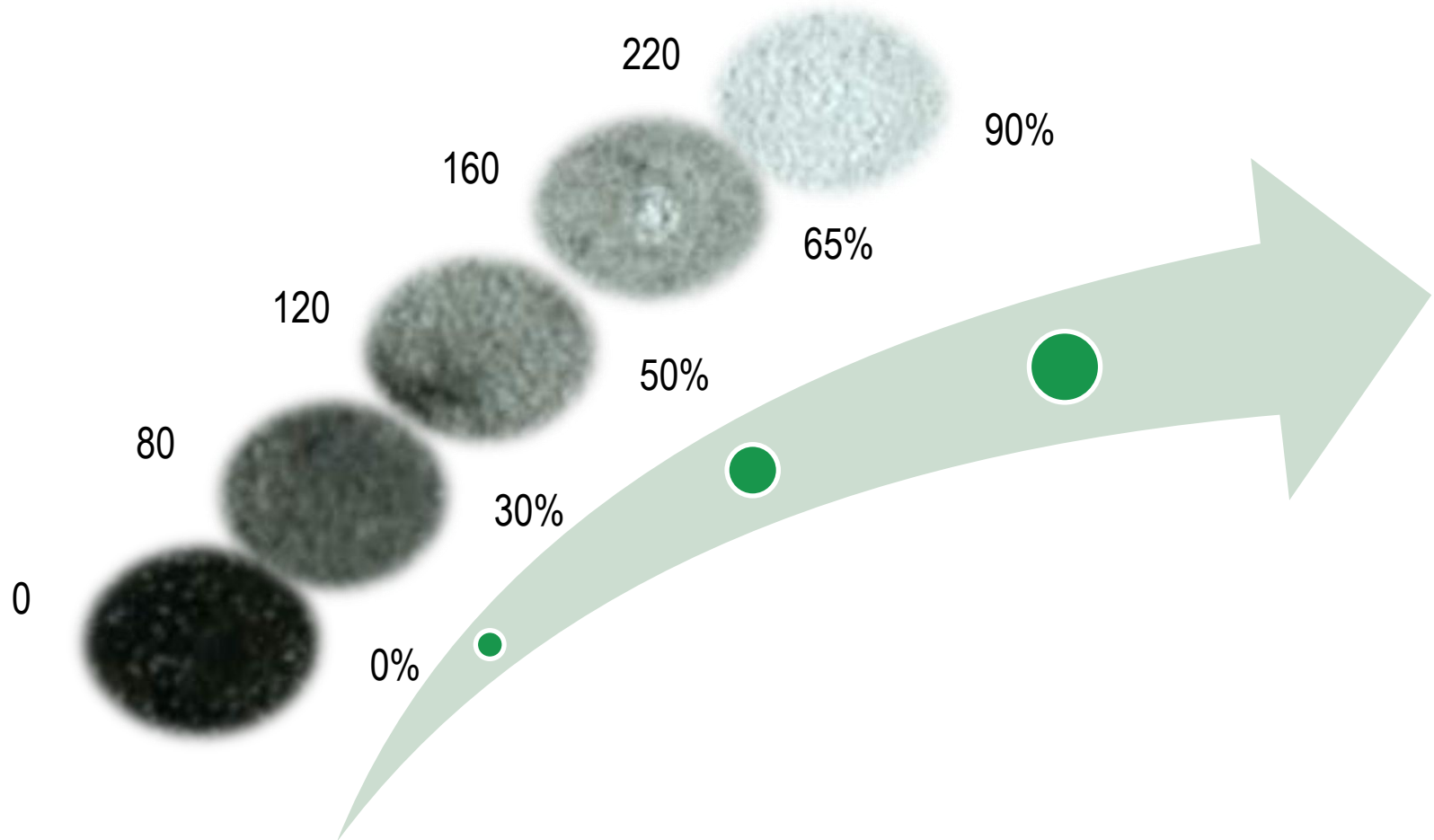


Eficiência de Limpeza

- Metodologia
 - Utilizar placas de PVC (Paviflex) previamente cortadas e limpas
 - Aplicar sujidade de padrão sobre a placa (2 mL por placa)
 - » Material particulado
 - » Óleo
 - » Gordura
 - Permitir que sujidade cure por 24h a temperatura ambiente (22°C)
 - Aplicar formulação sobre a placa manchada
 - Posicionar a placa em sistema de limpeza
 - Avaliar a eficiência de limpeza digitalmente e reportar a media dos resultados (realizar em triplicata).

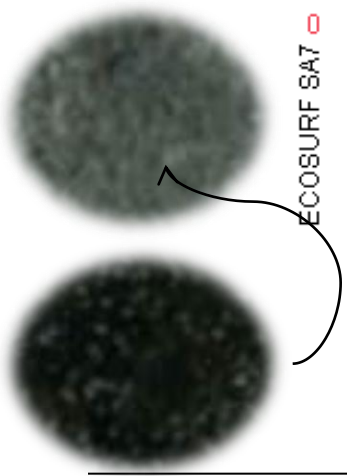
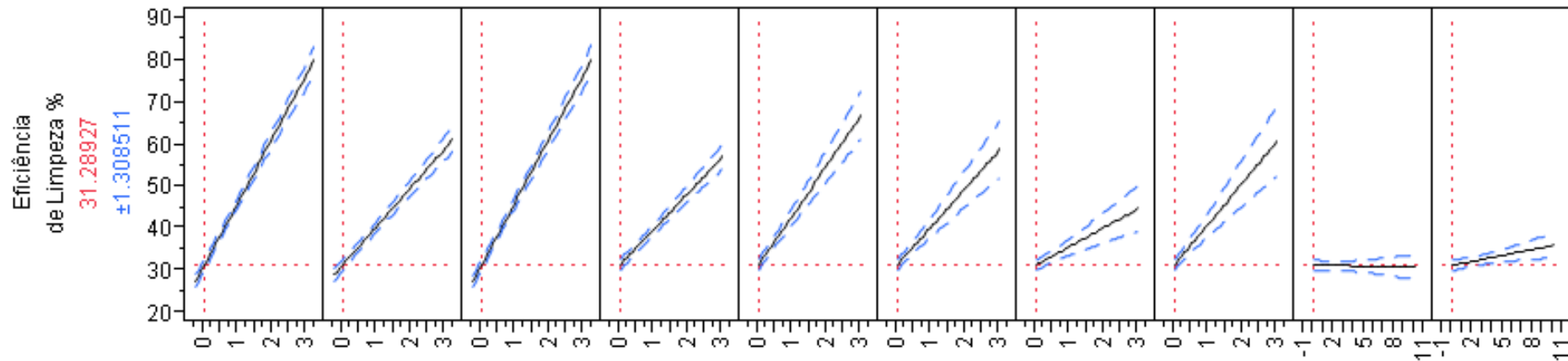


Escala de limpeza





Resultados



ECOSURF SA7

ECOSURF SA9

ECOSURF EH6

ECOSURF EH9

DOWANOL PNB

DOWANOL DPM

BUTYLCELLOSOLVE

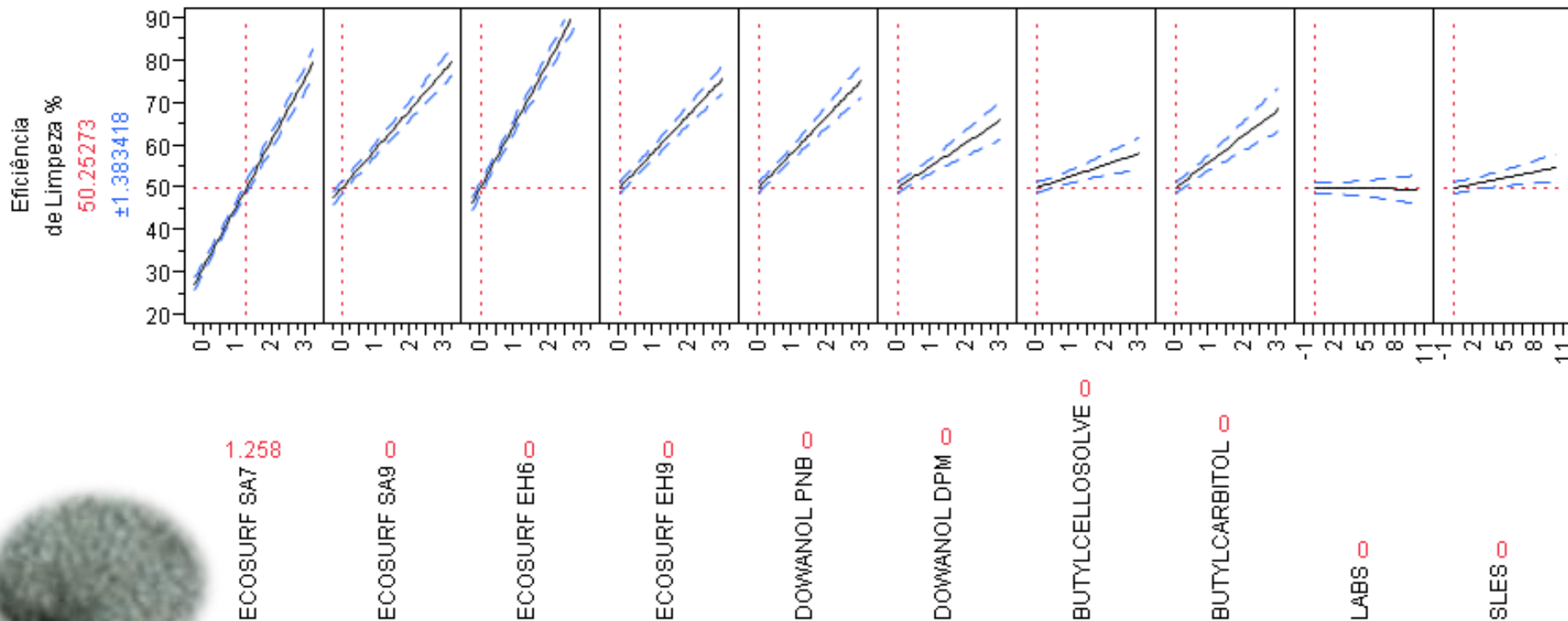
BUTYLCARBITOL

LABS

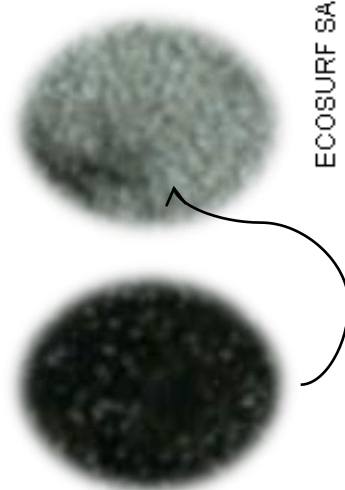
SLES



Resultados

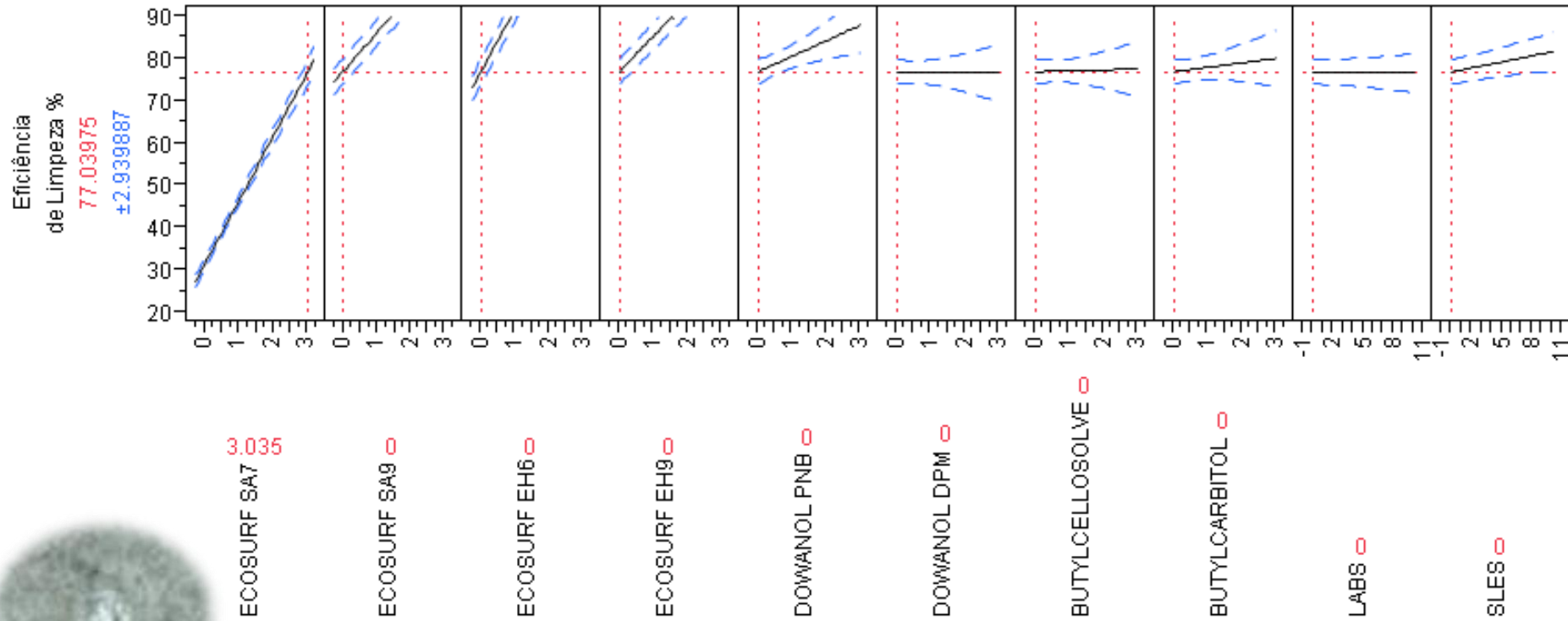


1.258





Resultados



3.035

ECOSURF SA7

ECOSURF SA9

ECOSURF EH6

ECOSURF EH9

DOWANOL PNB

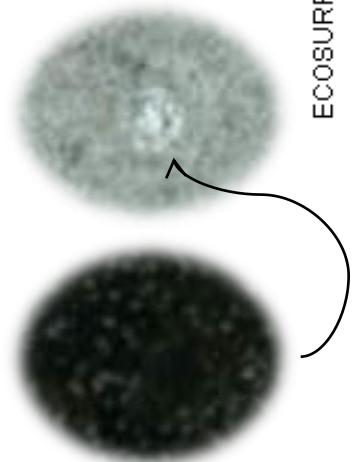
DOWANOL DPM

BUTYLCELLOSOLVE

BUTYLCARBITOL

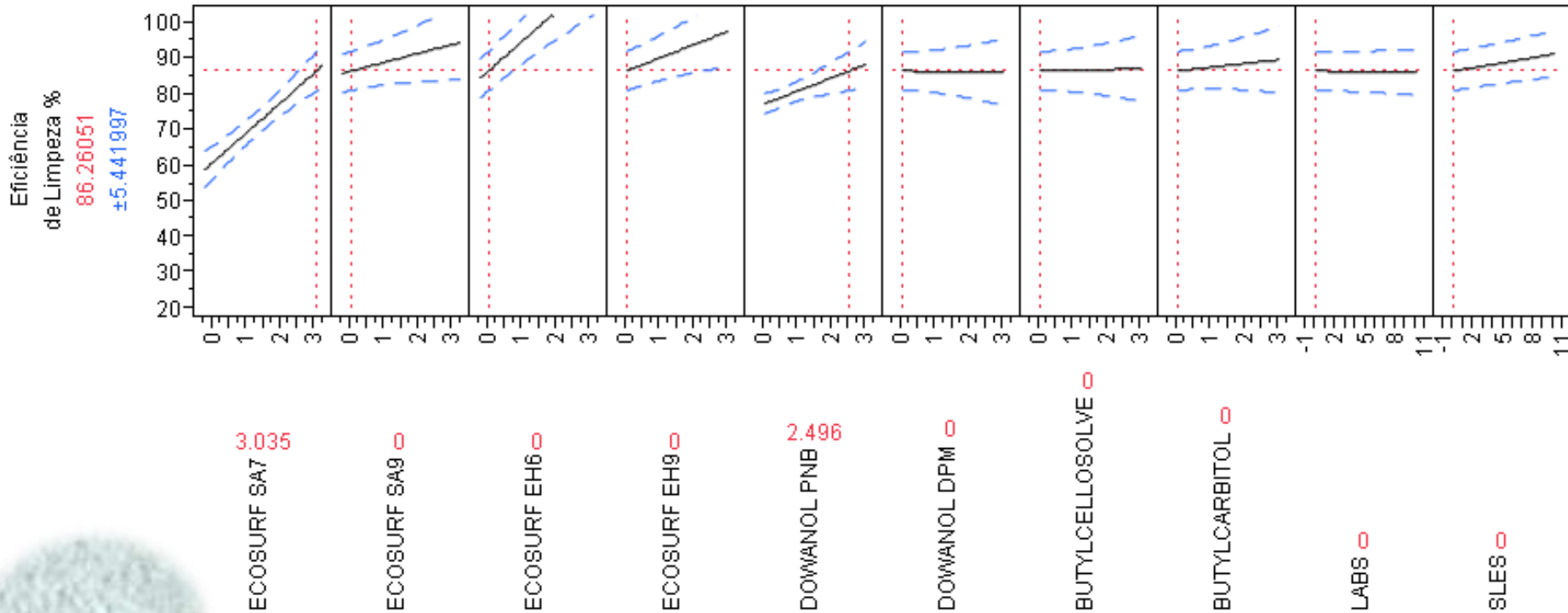
LABS

SLES



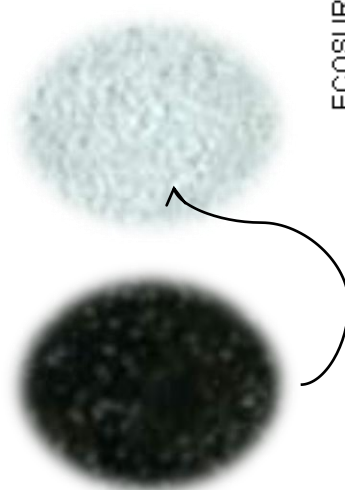


Resultados



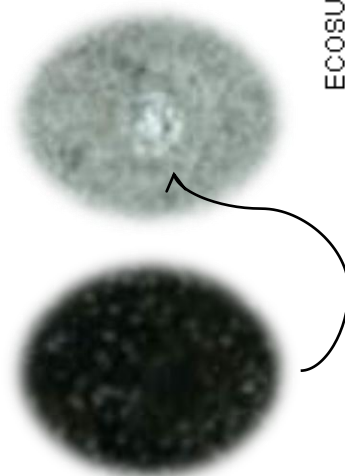
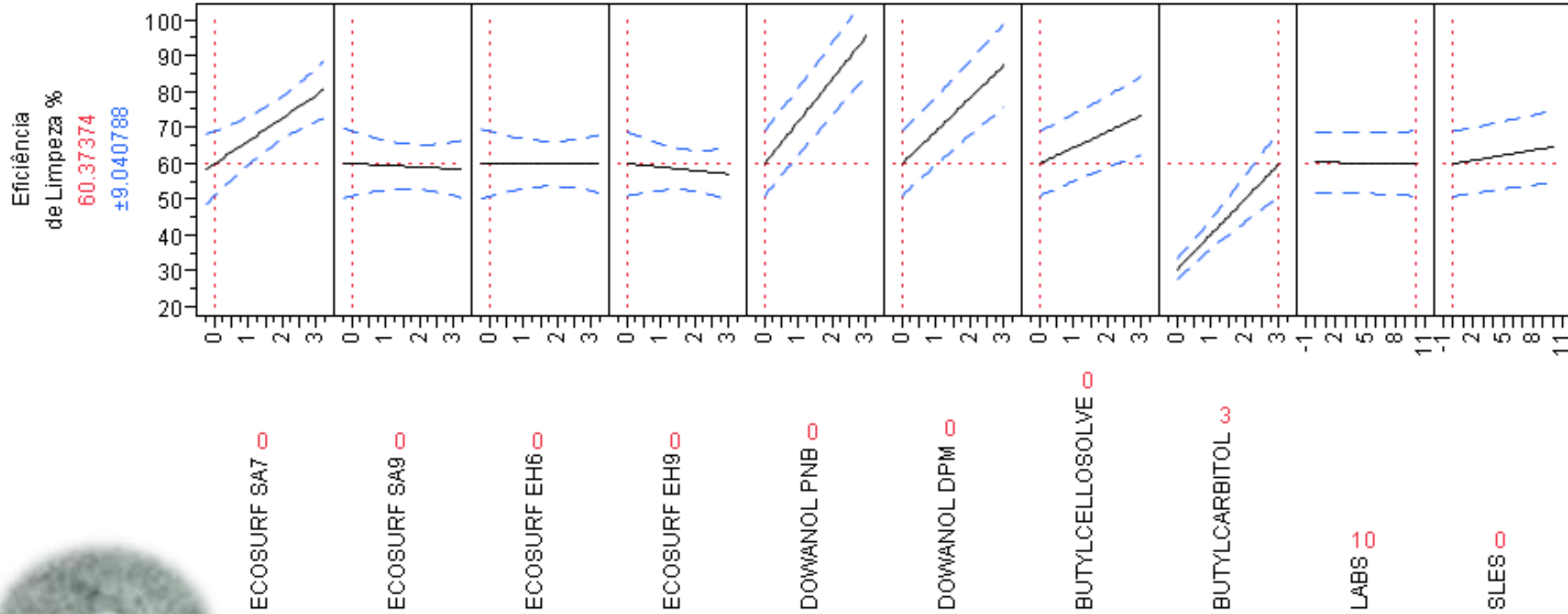
3.035

2.496



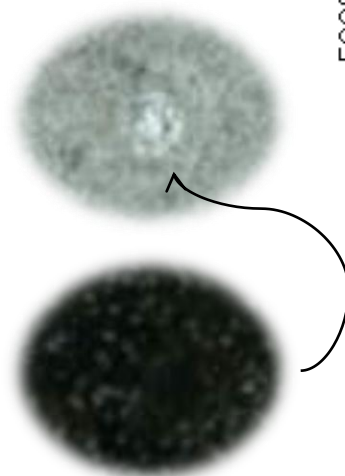
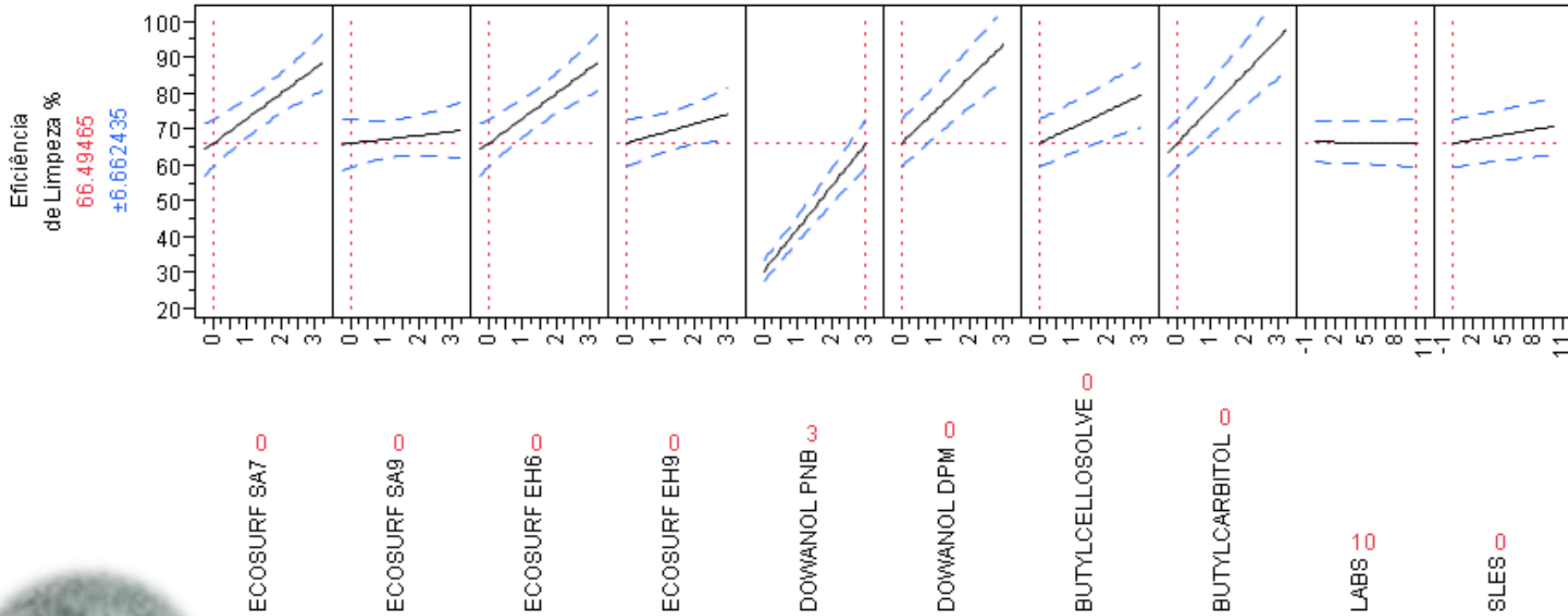


Resultados



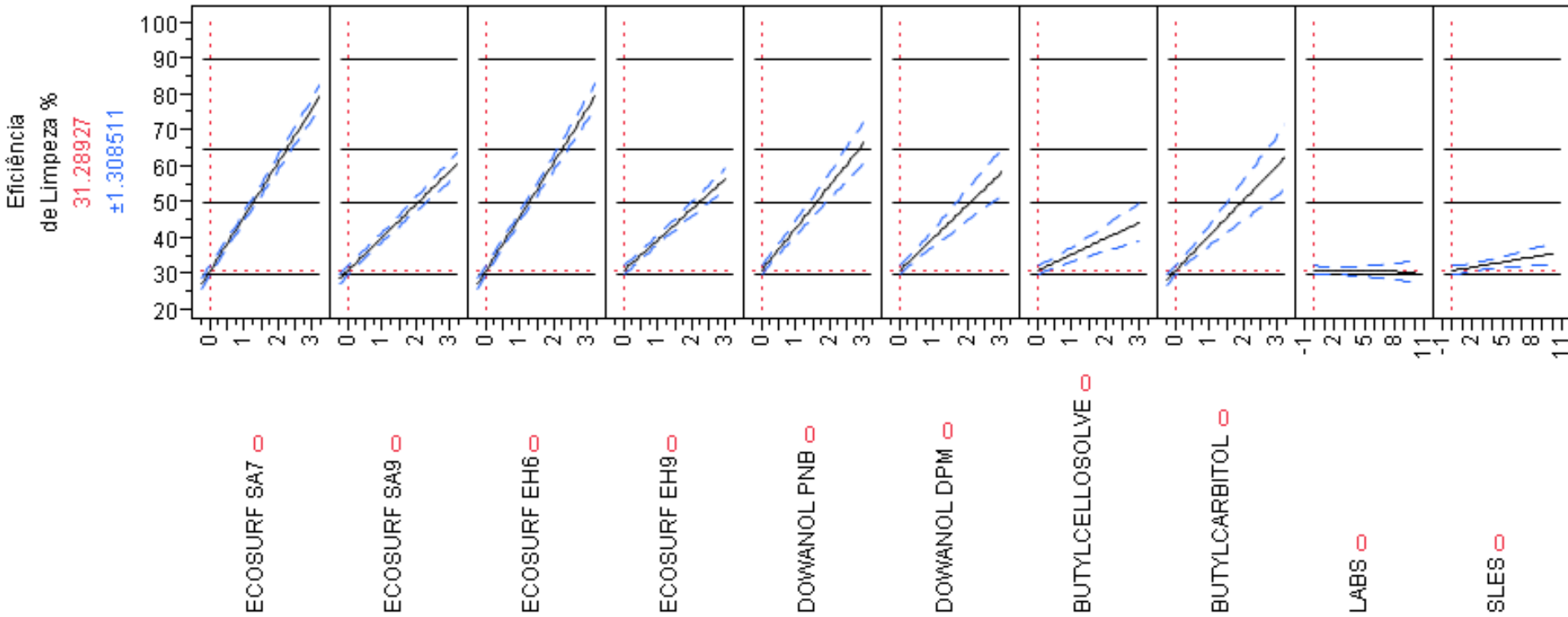


Resultados





Resultados



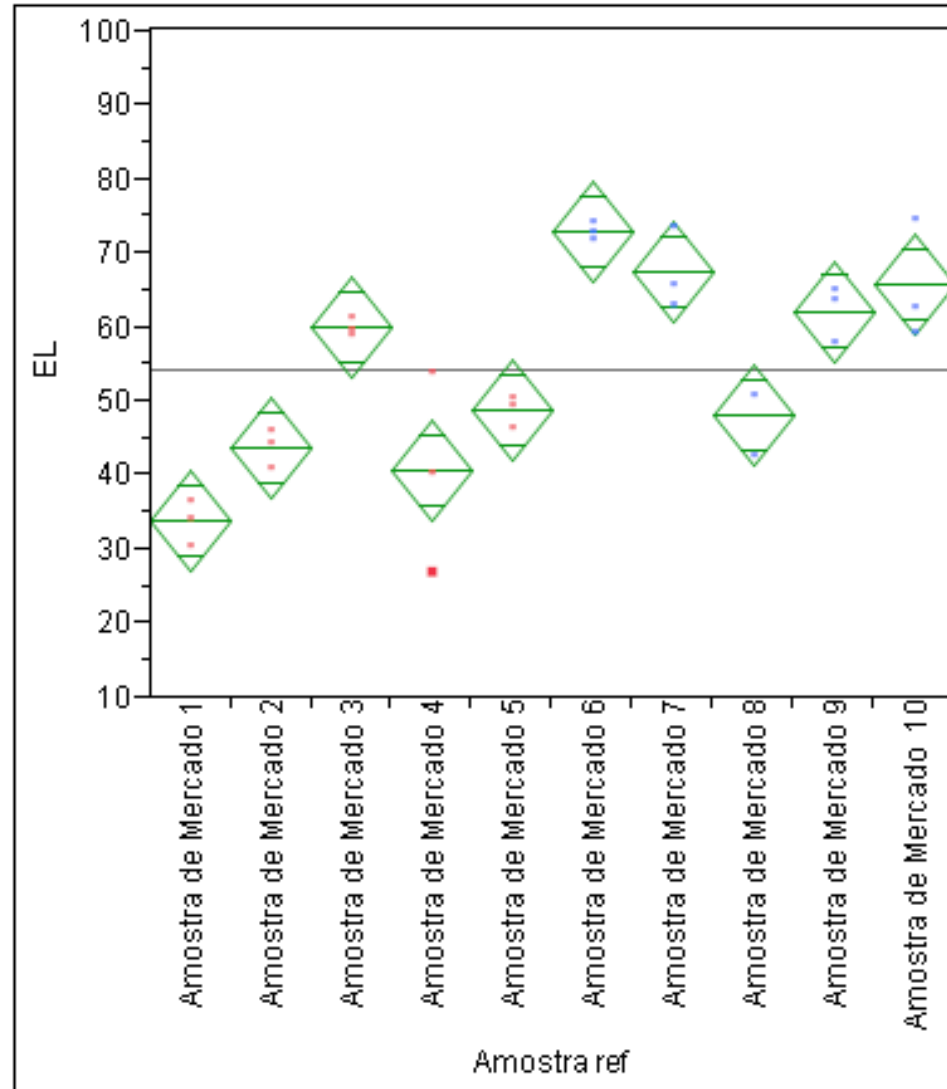
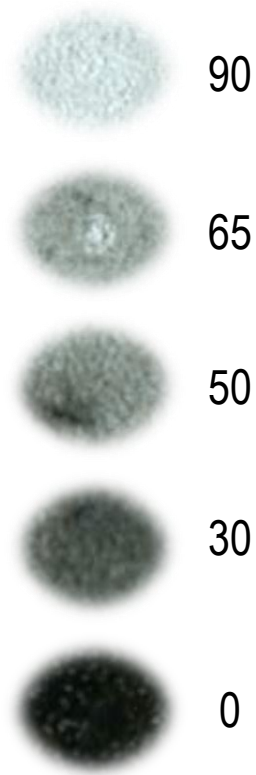
Ordem crescente da limpeza

1 5 2 7 3 6 8 4 10 9



Resultados das amostras de mercado

Escala





Conclusões

- Mercado de limpadores de superfícies é enorme e importante para os hábitos de higiene
- A eficiência de limpeza pode ser melhorada através da utilização de Ecosurf™ (tensoativos não iônicos)
- A escolha do éter glicólico é fundamental, podendo melhorar em mais de 10% a eficiência de limpeza dentre os solventes



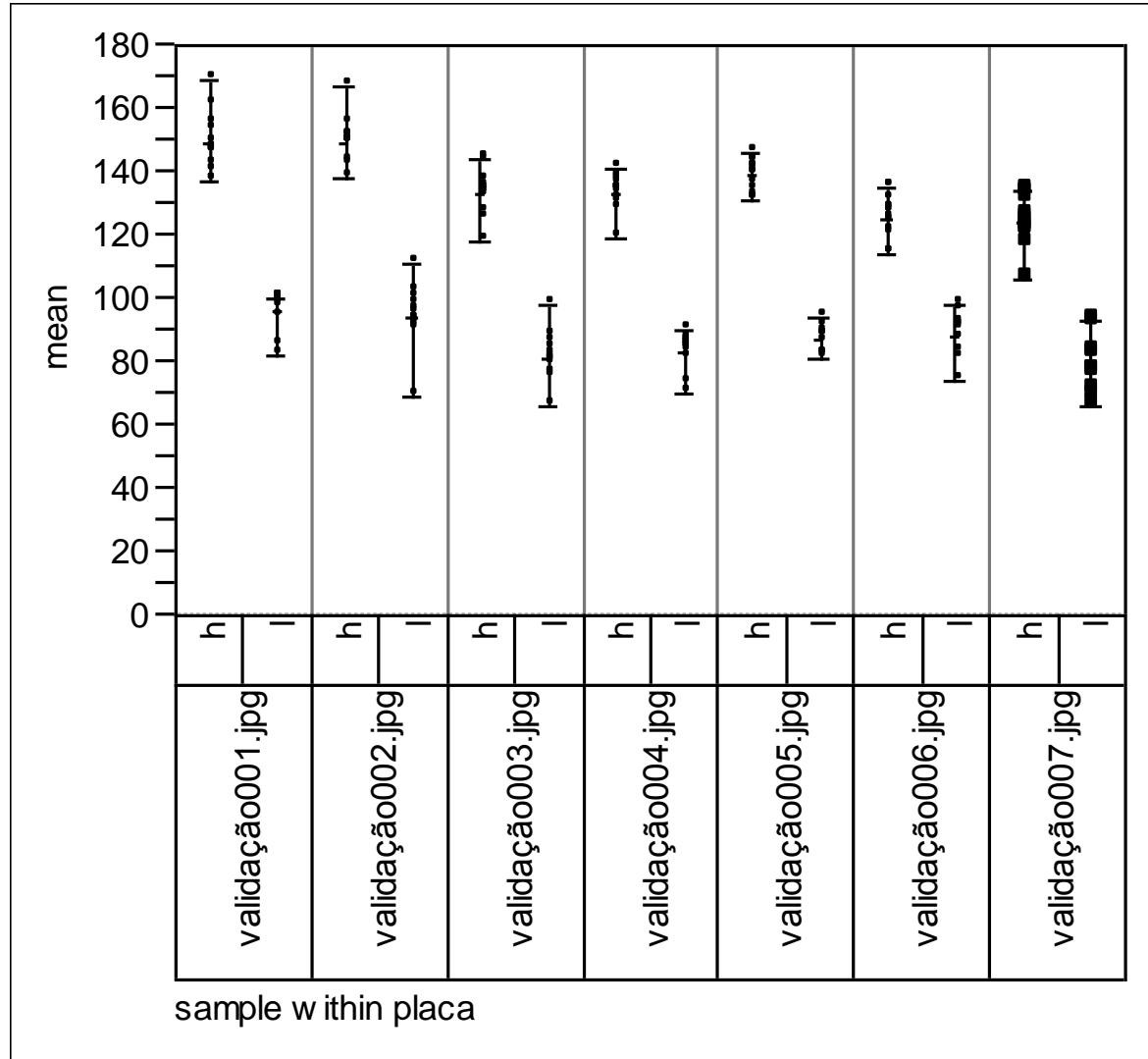
» ALVIM JORGE
• AJORGE@DOW.COM



- Backup slides

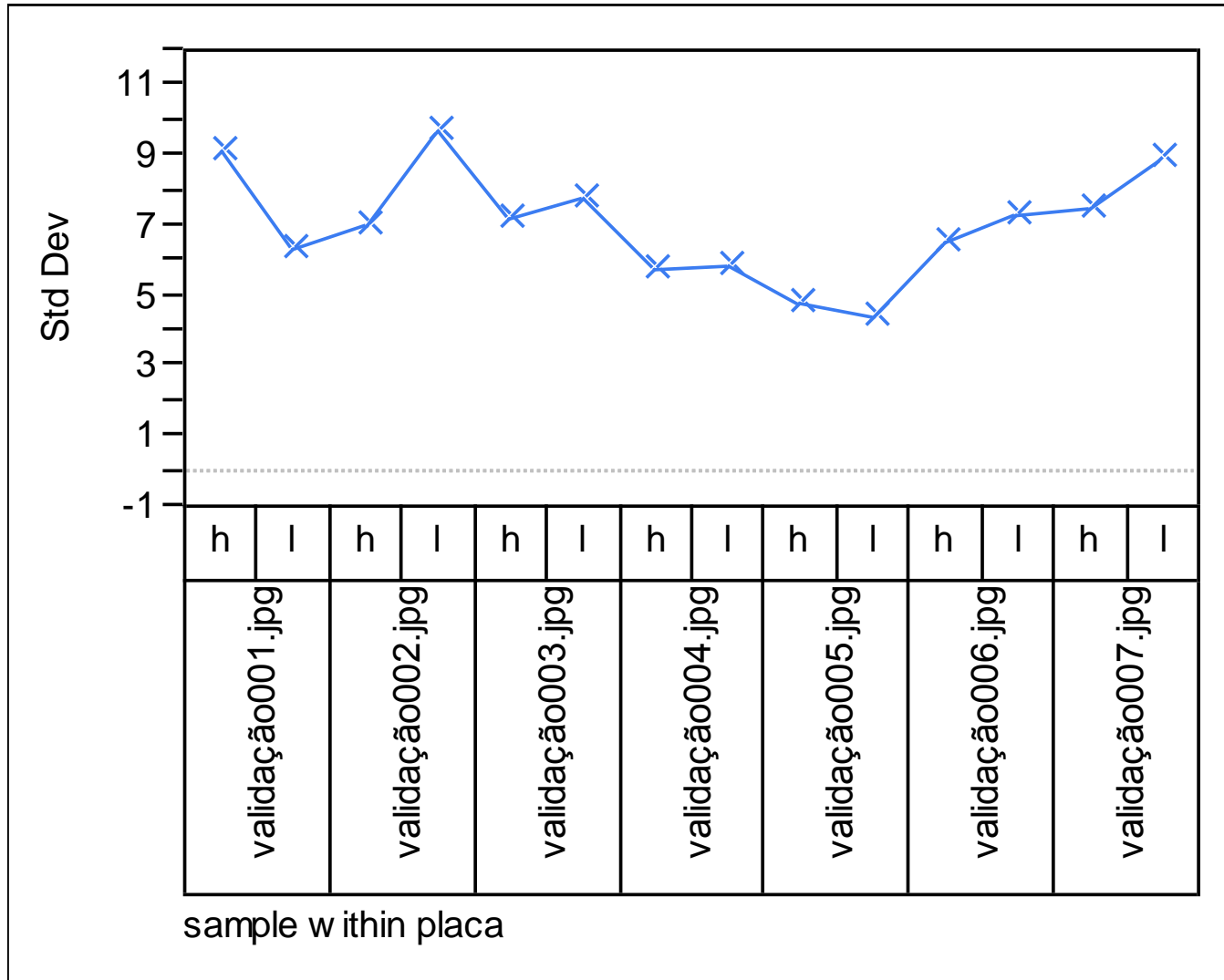


Evaluation of variability





Evaluation of variability





Evaluation of variability

Gauge R&R

| Measurement Source | | Variation (6*StdDev) | | which is 6*sqrt of |
|----------------------|--------------|----------------------|-----------------------|---|
| Repeatability (EV) | | 42.76155 | Equipment Variation | $V(\text{Within})$ |
| Reproducibility (AV) | | 50.45041 | Appraiser Variation | $V(\text{placa}) + V(\text{placa} * \text{sample})$ |
| | placa | 44.89493 | | $V(\text{placa})$ |
| | placa*sample | 23.01499 | | $V(\text{placa} * \text{sample})$ |
| Gauge R&R (RR) | | 66.13467 | Measurement Variation | $V(\text{Within}) + V(\text{placa}) + V(\text{placa} * \text{sample})$ |
| Part Variation (PV) | | 208.43364 | Part Variation | $V(\text{sample})$ |
| Total Variation (TV) | | 218.67413 | Total Variation | $V(\text{Within}) + V(\text{placa}) + V(\text{placa} * \text{sample}) + V(\text{sample})$ |

6 k

30.2435 % Gauge R&R = $100 * (\text{RR} / \text{TV})$

0.31729 Precision to Part Variation = RR / PV

4 Number of Distinct Categories = $1.41 * (\text{PV} / \text{RR})$

Using last column 'sample' for Part.

Variance Components for Gauge R&R

| Component | Var | Component | % of Total |
|-----------------|-----------|-----------|------------|
| Gauge R&R | 121.4943 | | 9.15 |
| Repeatability | 50.7931 | | 3.82 |
| Reproducibility | 70.7012 | | 5.32 |
| Part-to-Part | 1206.7939 | | 90.85 |

