SATRA TECHNOLOGY

Your premier technical partner

# Sustainability Using Production Efficiency Systems For Shoemakers

# 鞋类制造商使用生产效率系统来达到对可持续性发展

**Peter Allen**
**Divisional Manager**
**SATRA Technology**

# Sustainability 可持续性

"The quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance"

"对质量的要求不会危害到环境, 或是导致自然资源枯竭, 并且由此支持长期的生态平衡"

"sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

"可持续性发展是开发对现阶段的需求而无须后代人类要达到他们自身的需求做出妥协"

# Sustainability 可持续性

Sustainability is complex: whilst solving one sustainability issue it is not uncommon to create another !!
可持续性可谓复杂: 当处理完一个可持续性的事件, 往往又产生了另外一个,而这并非不寻常!!

The reduction of waste and the efficient use of resources will rarely have any unforeseen sustainability consequences.
减少 对资源的浪费并提升使用的效率 , 就很少会有不可预计的可持续性的结果。

# Selection of Production Efficiency Systems
# 生产效率提升系统的选择

This presentation is looking at how production efficiency systems can contribute to sustainability.
此演说着重在生产效率提升系统如何对可持续性的贡献

Production Efficiency Systems are selected primarily to achieve cost saving and increase production efficiency. However, both of which also impact positively on the long term sustainability of the products.
生产效率提升系统主要是被用来达到节省成本 并增加生产效率。然而, 这两项同样对产品长期的可持续性有正面的显著影响。

# Production efficiency Systems
# 生产效率提升系统

The major benefit is a significant reduction of the materials and resources used.
主要的利益是显著的降低材料和资源的使用

Additional benefits include: 额外的利益包括

- Increased productivity 提升生产力
- Improved product quality 改进产品质量
- Expanded knowledge 扩展知识

# Production efficiency Systems
# 生产效率提升系统

Three SATRA systems are used as examples for how these benefits can be achieved.
以三套 SATRA 开发的系统为范例来说明这些利益如何被达成

SATRASumm – Cutting materials with less waste
- 提升材料的裁断利用并减少废料

SATRA VisionStitch – Improved productivity and quality of stitching
- 改进针车产能和质量

SATRA Timeline – Production line efficiency at lower cost
- 生产线的效率提升并降低人工成本

# Leather Cutting Systems 皮革裁断系统

- Increased material utilisation 增加材料的利用
- Less scrap to landfill 降低废料造成的垃圾
- Reduced storage 减少贮存
- Less transportation 较少的运送
- Improved product quality 改进产品质量

# Key aspects of a leather grading system
# 皮革分级系统的特点

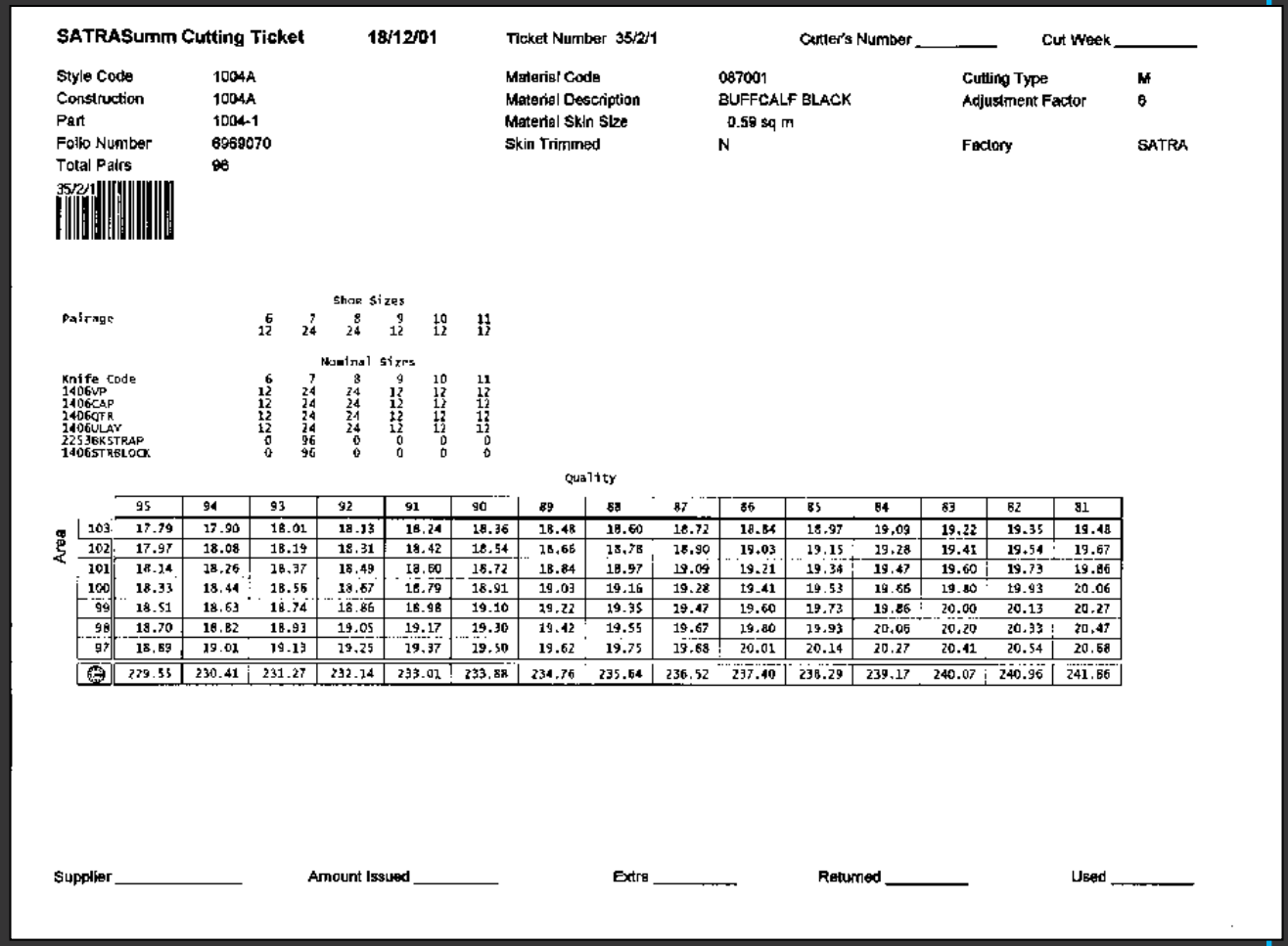
- Identification of unusable material
  定义不能被使用的材料
- Grading leather to  match product requirements
  皮革分级来符合产品的需求
- Agreed assessment of leather for usability between tannery and shoe manufacturer or tannery and leather goods manufacturer
  皮革厂和鞋类制造商或是皮革厂和皮革制品制造商双方必须同意对评估皮革使用率的标准


# Key aspects of a leather cutting system
# 皮革裁断系统的特点

- Intensive training of production personnel
  对生产人员的密集培训
- Leather cutter training, proving that the savings identified by the software can be achieved.
  对皮革裁断手的培训, 来证明由软件计算确定的材料节省是可以达到的


# Key aspects of a leather cutting system
# 皮革裁断系统的特点

- Monitoring results to identify problems and achieve continuous improvement
  监控结果来确定问题并且达到持续的改进



**SATRASumm Cutting Ticket** 18/12/01 Ticket Number 35/2/1 Cutter's Number _____ Cut Week _____

| | | | | | |
|---|---|---|---|---|---|
| Style Code | 1004A | Material Code | 087001 | Cutting Type | M |
| Construction | 1004A | Material Description | BUFFCALF BLACK | Adjustment Factor | 6 |
| Part | 1004-1 | Material Skin Size | 0.59 sq m | | |
| Folio Number | 6969070 | Skin Trimmed | N | Factory | SATRA |
| Total Pairs | 96 | | | | |

35/2/1

Shoe Sizes

| Pairage | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|
| | 12 | 24 | 24 | 12 | 12 | 12 |

Nominal Sizes

| Knife Code | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|
| 1406VP | 12 | 24 | 24 | 12 | 12 | 12 |
| 1406CAP | 12 | 24 | 24 | 12 | 12 | 12 |
| 1406QTR | 12 | 24 | 24 | 12 | 12 | 12 |
| 1406ULAY | 12 | 24 | 24 | 12 | 12 | 12 |
| 22536KSTRAP | 0 | 96 | 0 | 0 | 0 | 0 |
| 1406STRBLOCK | 0 | 96 | 0 | 0 | 0 | 0 |

Quality

| Area | 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 | 86 | 85 | 84 | 83 | 82 | 81 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 17.79 | 17.90 | 18.01 | 18.13 | 18.24 | 18.36 | 18.48 | 18.60 | 18.72 | 18.84 | 18.97 | 19.09 | 19.22 | 19.35 | 19.48 |
| 102 | 17.97 | 18.08 | 18.19 | 18.31 | 18.42 | 18.54 | 18.66 | 18.78 | 18.90 | 19.03 | 19.15 | 19.28 | 19.41 | 19.54 | 19.67 |
| 101 | 18.14 | 18.26 | 18.37 | 18.49 | 18.60 | 18.72 | 18.84 | 18.97 | 19.09 | 19.21 | 19.34 | 19.47 | 19.60 | 19.73 | 19.86 |
| 100 | 18.33 | 18.44 | 18.55 | 18.67 | 18.79 | 18.91 | 19.03 | 19.16 | 19.28 | 19.41 | 19.53 | 19.66 | 19.80 | 19.93 | 20.06 |
| 99 | 18.51 | 18.63 | 18.74 | 18.86 | 18.98 | 19.10 | 19.22 | 19.35 | 19.47 | 19.60 | 19.73 | 19.86 | 20.00 | 20.13 | 20.27 |
| 98 | 18.70 | 18.82 | 18.93 | 19.05 | 19.17 | 19.30 | 19.42 | 19.55 | 19.67 | 19.80 | 19.93 | 20.06 | 20.20 | 20.33 | 20.47 |
| 97 | 18.89 | 19.01 | 19.13 | 19.25 | 19.37 | 19.50 | 19.62 | 19.75 | 19.88 | 20.01 | 20.14 | 20.27 | 20.41 | 20.54 | 20.68 |
| | 229.55 | 230.41 | 231.27 | 232.14 | 233.01 | 233.88 | 234.76 | 235.64 | 236.52 | 237.40 | 238.29 | 239.17 | 240.07 | 240.96 | 241.86 |

Supplier _____ Amount Issued _____ Extra _____ Returned _____ Used _____

# Benefits of a leather cutting system?

# 皮革裁断系统的利益

For a footwear manufacturer producing 3,500 pairs/day of men's shoes, they will use 2,275,000 square feet each year. By working with a best practice leather cutting system they could reduce this figure by… 8%

对一个鞋类制造商而言, 每天生产3,500双男鞋, 他们每年将使用2,275,000平方英尺的皮料, 若使用最有效的皮革裁断系统, 可以减少皮料达… 8%

SATRASumm – Cutting materials with less waste

# Benefits of a leather cutting system?

# 皮革裁断系统的利益

This represents a saving of 182,000 square feet equivalent to the area of 2 football pitches !!

相对如果节省 182,000平方英尺的皮料, 则相当于两个足球场的面积!!

# Stitching productivity
# 针车生产率

- Stitching can represent up to 40% of work content in footwear
  对鞋类制作所包括的工作,
  针车部分高达40%
- Major user of energy
  主要的能量消耗者
- One of the most skilled operations in shoe manufacturing
  鞋类制作中最需要技能的工序之一

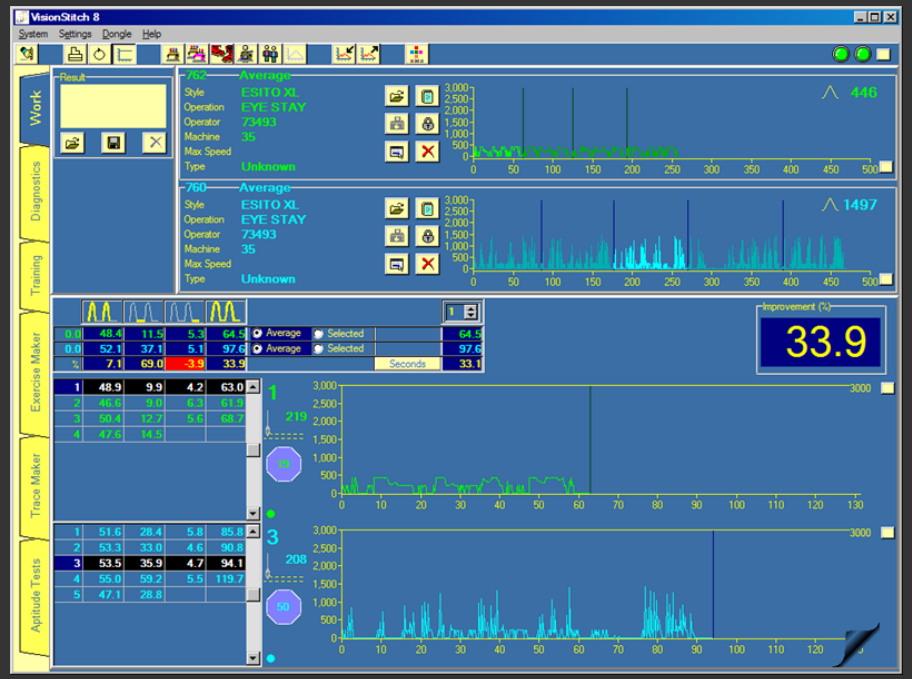
# Key aspects of stitching productivity
# 针车生产率的特点

- Operatives selected for natural ability
  选择适合操作员能力的方式
- Correct training needed
  需要正确的培训
- Working position is critical
  工作的位置非常重要
- Stitching machine configuration and motor matched to each operation
  针车机器的配置和马达的设定须符合每一个工序的需求

SATRA VisionStitch – Improved productivity and quality

# Key aspects of stitching productivity
# 针车生产率的特点

- Adjust speed and acceleration of the motor.
  调整马达的速度和加速度
- Reduce energy use.
  减少能量损耗
- Reduce rejected work and excess materials.
  减少不良品和过多浪费的材料
- Provide operative with increased control and confidence.
  提供操作员更多的掌控和信心




SATRA VisionStitch – Improved productivity and quality

# Benefits of stitching productivity

# 针车生产率的利益

- Less space, power and energy needed
  较少的空间, 力气和能量的需求
- Reduced storage and transportation
  减少贮存和运送
- Minimised throughput time
  生产时间的最小化
- Operator fatigue significantly reduced
  操作员的疲乏显著的减少
- Productivity increase by over 30%
  生产率提升超过30%

SATRA VisionStitch – Improved productivity and quality

# Line Balancing 生产线平衡

Identifying and minimising any bottleneck on a production line which causes low productivity.
确认并将生产线上任何会引起低生产率的瓶颈最小化

This wastes valuable resources such as energy, space, time and people
这会浪费可观的资源, 诸如能源, 空间, 时间和人力

# Line Balancing 生产线平衡

- Extra storage of materials, components and work in progress
  材料, 零部件和半成品的过度贮存
- Excess transportation of products between work stations
  增加产品在工作站之间额外的运送
- Time wasted looking for work
  浪费时间看顾工作

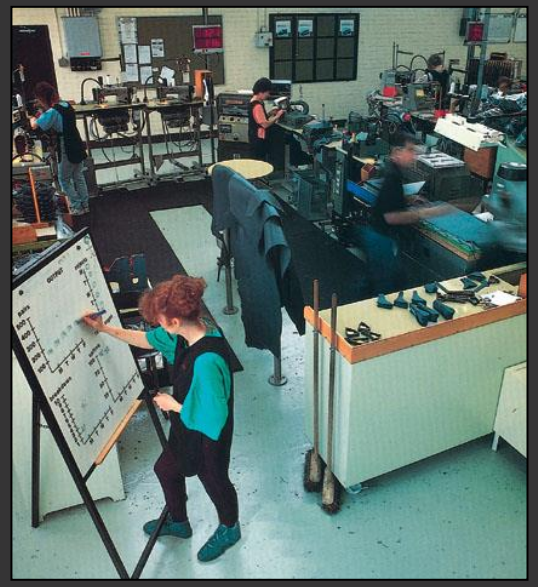
# General aspects of line balancing
# 生产线平衡一般的特点

- Analysis of working  methods
  分析工作方法
- Discussion with operatives to identify best practice
  与操作员讨论来确认最佳的操作方法
- Design of workplace layout
  工作区域布置的设计
- Provision of correct equipment
  提供正确的机器设备

# General aspects of line balancing

## 生产线平衡一般的特点

- Skilled operatives allocated to demanding tasks
  有技能的操作员应被分配需要高技能的工作
- Calculation of realistic production targets
  计算实际可达到的生产目标
- Efficient production planning to minimise style changes
  有效率的生产计划来尽量减少转换型体时的低效能



# Benefits of Line Balancing

# 生产线平衡的利益

- Reduced energy consumption 降低能源消耗
- Less space required 较少的空间需求
- Less time needed to produce the products
  对产品生产较少的时间需求
- Reduced operative fatigue and frustration
  减少操作员的疲劳和挫败感
- Fewer spoiled products
  不良品减少
- Minimised overuse of materials and components
  尽可能降低对材料和零部件的过度使用

# Benefits of Line Balancing

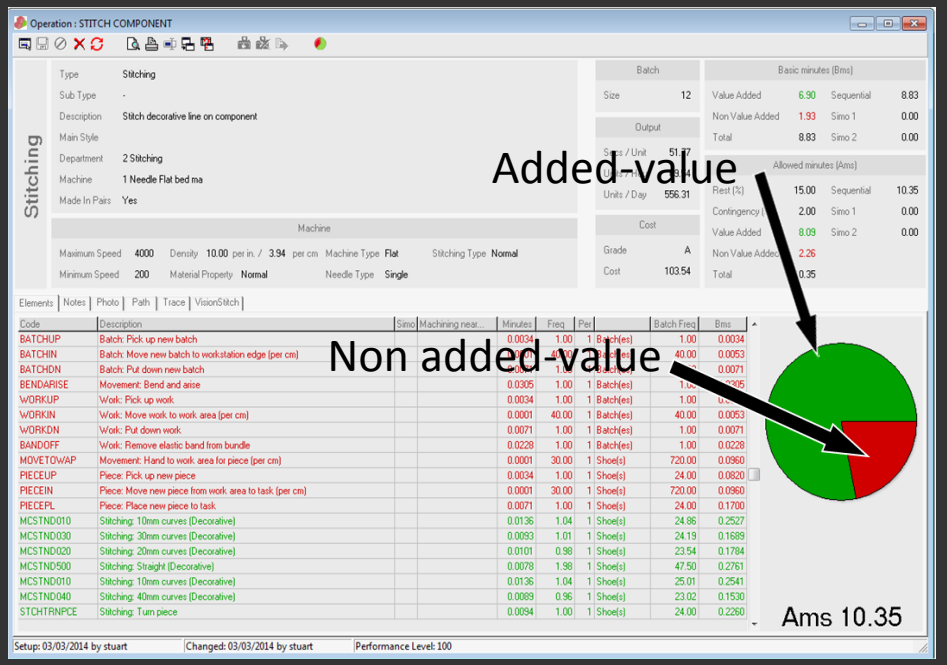
# 生产线平衡的利益

For a footwear manufacturer producing 3,500 pairs/day of men's shoes, using a best practice line balancing system, they could increase their productivity by over 18%.

对一个鞋类制造商而言, 每天生产 3,500双的男鞋, 使用最佳方案的生产线平衡系统, 他们将能增加生产率达超过 18%

They will produce an extra 164,000 pairs each year!

因此, 他们将每年生产增加额外的 164,000双




SATRA Timeline – Production efficiency at lower cost

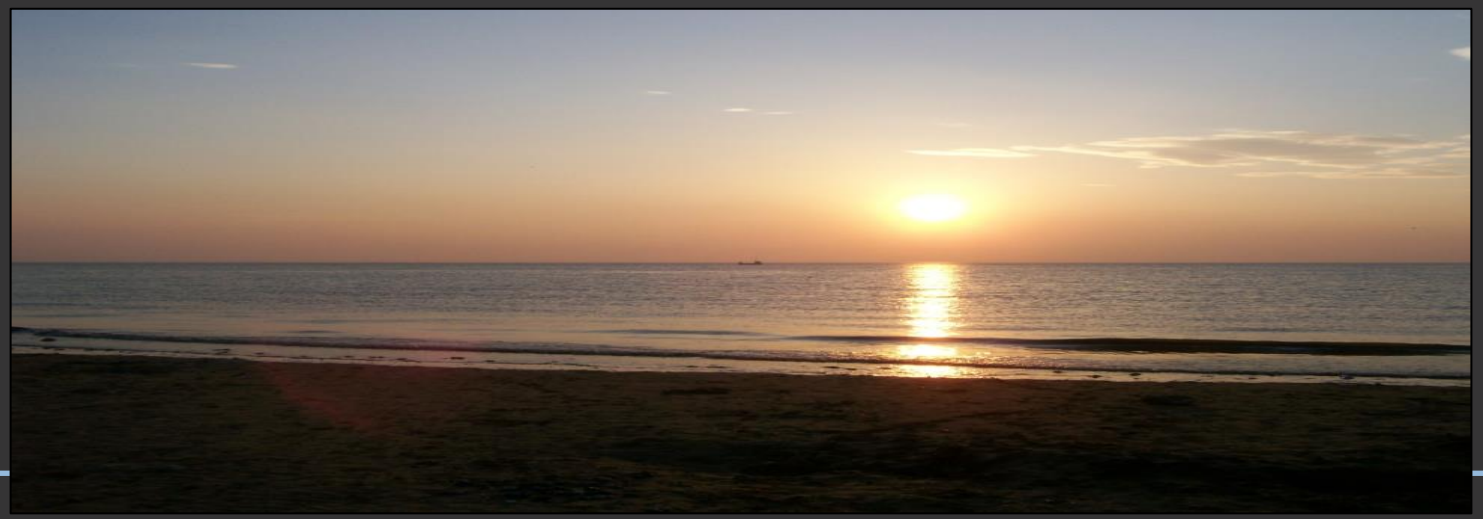
# Conclusion: Sustainability Benefits
# 结论: 可持续性的利益

- Materials savings (Transport and waste)
  节省材料 (运送和浪费)
- Energy use
  能源消耗
- Right first time (Reducing waste)
  第一次就做对 (减少废料)
- Fit for purpose (Durability)
  达到适用的目的 (持久性)

# Conclusion 结论

Sustainability is now a key part of the global supply chain.
There are many challenges ahead.
可持续性现今对全球供应链是重要环节
然而会面对很多挑战

Reduction of waste and efficient use of resources (material and personnel) can make an important contribution to sustainability
降低浪费和对资源有效率的运用 (材料和人力), 能达到对可持续性重要的贡献



SATRA TECHNOLOGY

Your premier technical partner