

Theme: Reducing Scrap in the Machine Shop

Background

1. Corporate Goals 2006

- Increase global market share
- Improve quality & service
- Increase corporate profits

2. Manufacturing Goals 2006

- Improve reduce cost by 5%
- Reduce scrap 15%
- Improve productivity 7%
- Improve HSE* Index 10%

Overall Scrap %

Year	Overall Scrap %
2004	3.2%
2005	2.7%
2006 (YTD)	2.6%
Goal	2.3%

Current Condition

Scrap by Department

Department	Scrap (\$K)
Machine Shop	700K
Welding Shop	200K
Assembly Shop	86K

Breakdown of Machine Shop Scrap Rates

Processes:	Milling	Turning	Drilling	Rough Grinding	Final Grinding
Scrap %	1.5%	0.9%	0.7%	3.7%	8.7%
Scrap \$\$	\$40K	\$27K	\$23K	\$150K	\$460K
Status*	▲	●	●	✗	✗

*Legend: ● 0-1% ▲ 1-2% ✗ 2+%

Goal

By December 2006:

- Reduce scrap in rough grind from 3.7% to less than 2%.
- Reduce scrap in final grinding from 8.7% to less than 2%.

Root Cause Analysis

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graph LR
    A[Undersized Shaft Defect] --- B[72% of grinding defects]
    B --- C[Man]
    B --- D[Machine]
    B --- E[Material]
    B --- F[Method]
    C --- C1[Contamination]
    C --- C2[Grinding Wheel Set Up]
    C --- C3[Manual offsets]
    D --- D1[Spindle]
    D --- D2[Clamp & Locator]
    D --- D3[Grinding Wheel]
    E --- E1[Dimensions]
    E --- E2[Hardness]
    E --- E3[Surface finish]
    F --- F1[Grinding Conditions]
    F --- F2[Coolant Concentration]
    F --- F3[Wheel dressing]
    
```