# Green Team Product Contract

**Product Description:** An oil filter cleaner which punches holes and spins the filter to efficiently remove oil.

**Intended Customers[1], Main:** small-medium automobile repair and lube businesses

**Peripheral:** recycling centers and disposal companies

**Market[2]:** Oil filter recycling equipment

**User[3]:** Automobile mechanic

**Client:** Ray Magliozzi, *Good News Garage*

| **Functional Needs** | **Product Attributes** | **Engineering Specifications** |
|---|---|---|
| Environmentally and recycling friendly | Fraction of oil removed | Can remove greater than 70% of oil |
| Reduces size of light duty filters (possible feature) | Volume reduction | Can reduce a LD filter by 50% in volume |
| Meets hot-draining standard for disposal of oil filters | Spinning time | Spinning time will be less than 8 minutes |

| **Operational (User) Needs** | **Product Attributes** | **Engineering Specifications** |
|---|---|---|
| Is safe to use | Stability | Does not tip over |
| | User protection | Sharp parts are not accessible during normal use |
| | | Has operational safety feature(s) |
| | | No pinch points |
| The product requires low user strength | Low activation force | At no time is the user required to exert more than 50 lbs of user force (OSHA) |
| Easily used by mechanic | Pragnanz: obvious, simple | Applies Gestalt Grouping Laws and human factors principles |

[1] Customer is defined as the purchaser.
[2] Market refers to product type.
[3] The user is who we seek to please, the person whose feedback is relevant to the human factors aspect of the product.

| Economic Needs | Product Attributes | Engineering Specifications |
|---|---|---|
| Competitively priced to recycling alternatives | Cost | Less than $700 for spinner and crusher combo,<br>Less than $500 for spinner |
| Short user interaction time | Time to operate | Average time required of user is less than 30 seconds per filter installation |
| Is easy to repair and maintain | Ease of replacement puncture part installation | Requires less than 5 (?) minutes to replace puncture part |

| Physical Characteristic Needs | Product Attributes | Engineering Specifications |
|---|---|---|
| A container for holding used oil spun out of filter | Volume, storage capacity | Able to store at least 2 gallons (7.6 liters) of oil |
| Integrates into shop environment | Footprint Area | Less than 24" x 24" footprint<br>Possibly fits on a workbench or shop countertop |
| | Power compatibility | Can be air or hydraulic powered |
| Can handle light duty (LD)[4] filters (75% of market[5]) | Motor power | Motor can spin filters less than 2.5 pounds (~1000 grams) |
| | Radial acceleration | Can achieve 640 $ft/s^2$ (20g) |
| | Internal space for filter | Can fit 2.5-4" diameter by 3-8" in height oil filters |

[4] LD mass < 1000 grams; HD mass < 2100 grams.

[5] Market means oil filters sold, heavy duty filters are used on buses, semi-trucks, etc. These are assumed not to go for maintenance at automobile service centers.