



FORMULA 224

Brulin's Most Aggressive Spray Wash Detergent

**Aggressive
Performance of a
Highly Alkaline Cleaner
in a Safer, Balanced
Formulation**



**Spray Wash
Detergent**

With the performance of a highly alkaline cleaner in a balanced, engineered formulation, Formula 224 is an excellent choice for cleaning the most stubborn soils as found in transmission rebuild and other heavy-duty applications.

- **Extra Heavy-Duty Cleaning**
For stubborn greases and carbonized soils

Benefits

- **Water-Based, Dilutable Formulation** – For Environmental Safety & Economy of Use
- **Low Foaming at Temperatures Greater Than 120°F (49°C)**
- **Free Rinsing** – Cleaner Parts & Simplified Cleaning

Greener 11 Ways

More user and environmentally friendly, reducing costly paperwork

1. No Ozone Depleting Substances
2. No Global Warming Potential
3. No RCRA Reportable Ingredients or Characteristics
4. No Glycol Ethers
5. No APs (Alkylphenols) or APEs (Alkylphenol ethoxylates)
6. No Chelants
7. No Butyl
8. No Amines
9. Recycles Easily
10. Biodegradable
11. RoHS Compliant

FORMULA 224

Performance Properties

Substrates

Formula 224 is non-corrosive and non-staining to a wide variety of alloys. Some selected categories of materials compatible with Formula 224 include*:

Ferrous Metals: Carbon Steel • Stainless Steel

Non-Ferrous Metals & Alloys: Aluminum • Magnesium & Magnesium Alloys • Nickel, Nickel Alloys & Plating • Titanium & Titanium Alloys

Plastic & Composites: High Density Polyethylene/HDPE • Polyvinyl Chloride/PVC

Other: Glass

Soils

Formula 224 removes a wide range of organic and inorganic soils. Some categories of soils that can be removed with Formula 224 include*:

Buffing Compounds • Carbon • Coolants • Dirt (Particulate) • Fat • Fluorinated Greases • Flux • Grease • Oil (General, Cutting, Drawing Compounds, Finger Prints, Forming, Honey, Hydrocarbon, Lubricants, Self Emulsifying, Silicone/Greases, Sulfur/Chlorinated, Water Soluble) • Tar & Pitch

*Material compatibility should always be confirmed via testing with specific contaminants under specific cleaning conditions.

Use Ranges

System	Spray Wash Systems (Batch or Continuous)
Dilution	3-15%, typically used at 5%
Cleaning Temperature Range	130-180°F (54-82°C), typically used at 140-150°F (60-66°C)
Cleaning Duration	1-30 minutes: typical parts are cleaned in 3-10 minutes
Rinse Temperature	A heated rinse may improve overall performance. Some OEM process specifications may require a heated rinse.
Rinse Water Quality	Recommended conductivity of final rinse water: <ul style="list-style-type: none"> • Ultra-Clean Applications: ≤ 50 microsiemens • Precision Cleaning: ≤ 500 microsiemens • Gross Cleaning: > 500 microsiemens
To avoid spotting, it is best if the parts remain wet between processing stages.	

Concentration Verification

Burlin Titration Kit (Prod. No. XTRKIT)	
Sample Size:	5 mL
Titrant:	1.0 N HCl Solution
Indicator:	Bromophenol Blue - 2 drops
Concentration %:	Drops Titrant x 0.18
or	
Sample Size:	50 mL
Titrant:	1.0 N HCl Solution
pH Endpoint:	8.50
Concentration %:	mL Titrant x 0.575

Typical Chemical Characteristics

Physical Form	Liquid
Color	Light Yellow
Odor/Fragrance	Mild
Viscosity	Water-thin
Weight	11.2 lbs/gal (1.34 g/ml)
pH of Concentrate	>14.0
pH of Working Solution	12.9
Flash Point	None
Foaming Tendency	Low
Cloud Point	>130°F (54°C)
Calculated V.O.C	0% (0 g/l)
Freeze/Thaw	Reusable after thawing & remixing

Burette Test Method	
Sample Size:	50 mL
Titrant:	1.0 N Acid Solution
pH Endpoint:	4.50
Concentration %:	mL Titrant x 0.415



Safety

DANGER: Keep away from eyes, skin and mucous membranes. Wear chemically resistant (rubber) gloves and goggles when working with product. Causes severe burns to skin and eyes. Inhalation of mist can irritate nose, throat and respiratory tract. Do not ingest. Contains Potassium Hydroxide and Sodium Metasilicate.



Hazard Rating

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe		
HMS	HEALTH	NFPA
3	0	3
0	FLAMMABILITY	0
0	REACTIVITY	0

FIRST AID: *Eye Contact:* Flush with large amounts of water for 20 minutes, lifting upper and lower lids occasionally. Get medical attention. *Skin Contact:* Wash with mild soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation develops or persists. *Inhalation:* Remove to fresh air. If breathing is difficult, administer oxygen. *Ingestion:* Do not induce vomiting. Dilute by giving water. Give Milk of Magnesia if available. Keep warm, quiet and consult physician. Never give anything by mouth to an unconscious person.

PRECAUTIONS

- KEEP OUT OF REACH OF CHILDREN
- FOR INDUSTRIAL OR COMMERCIAL USE ONLY

Packaging

SHIPPING: Packing Group II.

STORAGE: Store in well-ventilated areas at temperatures between 40-110°F (4-43°C). The recommended shelf life of this product is 48 months.

DISPOSAL: Biodegradable. Pretreat by skimming and/or filtering. Final sewerability is determined by the municipal sewer district covering the plant location.

AVAILABILITY:

- 5 Gal (19L)
- 55 Gal (208L)
- 275 Gal Tote (1,041L)
- Bulk - up to 5,000 Gal (~19,000L)

Companion Products

815 QR

Heavy-Duty Immersion & Ultrasonic Detergent

DISTRIBUTED BY:

PRODUCT NUMBER
301005



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