



## Container Performance Model for Beverages

### No other model gives you so many options!

If your company has a proprietary model for predicting shelf-life performance, use the chart below to **compare the features** offered by M-RULE® to the capabilities provided by your current model. Then, envision how the added features of M-RULE® will allow you to rapidly evaluate more opportunities for cost savings and shelf-life extension!

M-RULE	Model Feature/Component -- Inputs	Your Model
✓	CO <sub>2</sub> Permeation	
✓	O <sub>2</sub> Permeation	
✓	Vitamin C Oxidation	
✓	O <sub>2</sub> Scavengers	
✓	N <sub>2</sub> Permeation	
✓	H <sub>2</sub> O Permeation	
✓	Polymer Materials, Blends, and Copolymers of:	
✓	PET	
✓	PEN	
✓	PCT	
✓	PBT	
✓	PEI	
✓	HDPE	
✓	LLDPE	
✓	PVC	
✓	Polystyrene	
✓	Nylon 6	
✓	Nylon 66	
✓	MXD6	
✓	EVOH-32	
✓	EVOH-44	
✓	Polyacetal	
✓	Polycarbonate	
✓	Monolayer sidewalls	
✓	Multilayer sidewalls (up to 7 layers)	
✓	Barrier Coatings:	
✓	Organic coatings	
✓	Inorganic coatings	
✓	Composite Materials	

M-RULE	Model Feature/Component -- Inputs	Your Model
✓	Polymer Modifications:	
✓	Degree of orientation	
✓	Crystallinity	
✓	Crosslink density	
✓	Oxygen scavenging capacity	
✓	Scavenging activity	
✓	Package characteristics:	
✓	Surface area	
✓	Sidewall material distribution	
✓	Base type	
✓	Closure characteristics:	
✓	Surface area	
✓	Cap thickness	
✓	Closure materials (up to 3 layers)	
✓	Filling Conditions:	
✓	Fill level (from empty to brimfull)	
✓	Humidity	
✓	Temperature	
✓	Beverage degassing	
✓	Headspace degassing	
✓	Sidewall degassing	
✓	Initial carbonation level	
✓	Empty bottle storage conditions	
✓	Environmental Conditions:	
✓	Temperature	
✓	Humidity	
✓	Safe, Secure, Off-site Data Storage	
✓	Accessible 24/7 from any Internet location	
✓	Validation by Major Beverage Companies	

M-RULE	Model Feature/Component -- Outputs	Your Model
✓	Diffusion/Solubility Calculations:	
✓	Bottle sidewall	
✓	Closure	
✓	Numeric shelf-life predictions	
✓	Side-by-Side Comparison Charts	
✓	Executive Summary Report (automatically generated)	

Thank you for your interest in the **M-RULE®** Container Performance Model for Beverages.

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