



TONKA EQUIPMENT COMPANY

Project Profile

Michigan Automotive Compressor Incorporated.
Parma, MI

**MICHIGAN AUTOMOTIVE
COMPRESSOR, INC.**

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DESIGN ENGINEER

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APPLICATION:

Iron and Manganese Removal
Hardness Reduction

TONKA PROCESS EQUIPMENT:

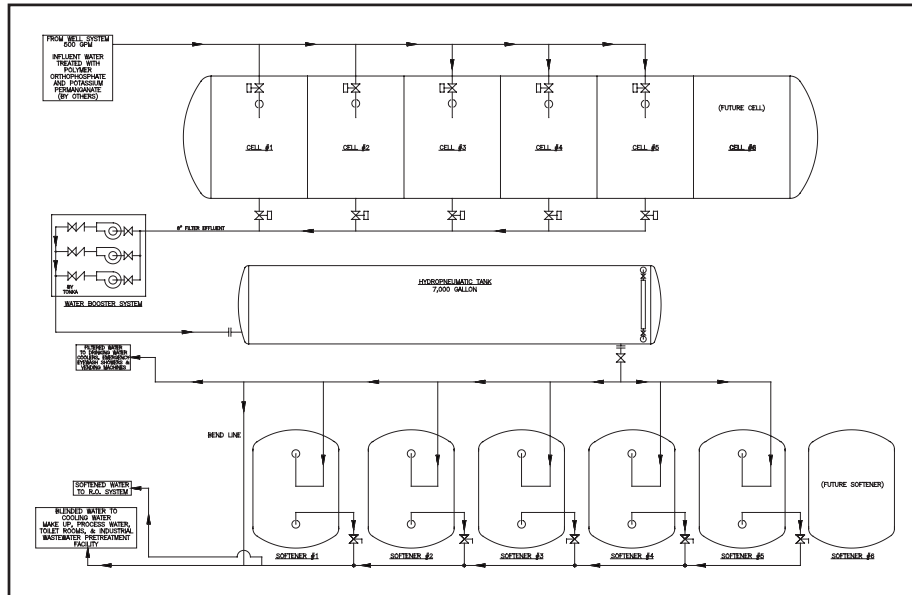
Horizontal pressure filter isolated cell design with sustained Simul-Wash™ backwashing, Hydropneumatic tank, Cation Ion Exchange vessels, Pumps, PLC controls.

PROJECT

Due to the rapid growth of this automotive parts manufacturer, water demand within the plant had outgrown its water production capabilities. Hubbell, Roth & Clark, Inc. Consulting Engineers were hired to evaluate current water usage and design a new water treatment facility that could handle the plant's current and future water demands. After reviewing a number of treatment options the engineers at Hubbell, Roth & Clark chose Tonka's proposed filter layout to design the plant around. Raw water entering the plant has iron, manganese and moderate hardness, all needing to be reduced prior to plant distribution. The water demand within the plant varies with a peak demand of 500 gpm. Water usage is around the clock, to keep this plant on line.

PROCESS

The water treatment facility consists of chemical oxidation of iron and manganese, one horizontal pressure filter, constructed as isolated cells with a dual media bed of manganese greensand and anthracite, a booster pump station, a hydropneumatic storage tank, followed by cation ion exchange vessels for softening prior to plant distribution.



The horizontal pressure filters are designed with multiple cell compartments above AND below the underdrain within for a total of six individual filter cells. Five cells are currently utilized with one additional cell available for future plant expansion. This unique filter design allows for an individual cell to be backwashed or taken completely off line while the remaining cells continue to produce filtered water. Each filter cell supplied includes the value added “Simul-Wash™” backwash process. This unique process uses air and water in combination at sub fluidization water rates, providing the most effective means of backwashing granular media filters.¹ Tonka’s Simul-Wash™ media rejection backwash trough was integrated into the filter design which enables the air and water backwash cycle to continue for a limitless period of time without media loss. These process features maximize filter cleaning efficiency and reduce the backwash wastewater generated by approximately 50% over conventional methods. This is a key process design that is saving MACI money every time they backwash. Filtered water is pumped up into a hydropneumatic tank for storage. As the demand for water increases, the hydropneumatic tank discharges water through the softeners and out into the plant. The ion exchange softeners reduce the water hardness prior to plant distribution.

PERFORMANCE

The raw water analysis summarized below reflects moderate to high concentrations of iron manganese and hardness existing in the water. The treatment process has been highly efficient in delivering high quality water as indicated below.

	Raw Water	Finished Water
Iron (as Fe)	1.5 – 2.3 mg/l	ND mg/l
Manganese (as Mn)	0.07 mg/l	0.02 mg/l
Hardness as CaCO ₃	< 300 mg/l	< 90 mg/l

FOR ADDITIONAL DETAILS, CONTACT:

Tonka Equipment Company

¹Amirtharajah, Appiah, et al. *Optimum Backwash of Dual Media Filters and GAC Filter-Adsorbers With Air Scour*, AWWA Research Foundation and American Water Works Association, 1991.



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