

The survey says, . . .



These spear points illustrate the coherent coating of marine grade castings in excellent condition after one year on the beach.

“Marine grade castings!”

■ A pictorial survey of eight case studies suggests that using marine grade castings and a modified powder coating application to avoid degassing results in long lasting beautiful aluminum castings, even in harsh salt water environments.

By Jon McGraw
Alloy Casting Co. Inc.

There are many steps necessary to providing a good, hard, coherent coating to aluminum castings. These steps include proper cleaning and rinsing, degassing, and proper curing of the coating. However, even if these steps are followed and the powder coater does the best possible job, sufficient evidence from on-site inspections and field reports suggests that another step is necessary on your part: using marine grade base material. The marine grade approach offers added pro-

tection that makes your job look better for a longer period of time. And that reduces call backs, which makes all of us happier.

The rapid flaking and peeling of coatings from aluminum castings in a severe weather environment or the normal long term slow deterioration in a mild environment can be resisted with the proper selection of marine grade base metal because marine grade aluminum castings resist corrosion and improve coating performance.

For your information

Poor finish: Non-marine grade castings and sub-par powder coating application (page 30).

Better finish: Marine grade castings and sub-par powder coating application (page 32).

Best finish: Marine grade castings and good powder coating application including a modified degassing pre-bake cycle (page 34).

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This marine grade and well powder coated spear and ball cap located just 100 yards from the ocean is in excellent, coherent condition after 3 1/2 years.



This marine grade large, heavy seashell aluminum casting adorning an exterior fence located between the Intracoastal Waterway and the Atlantic ocean shows a coherent coating in excellent condition after two years.

several years, he said, "I don't know where they are. I only know I have had no call backs because of poor performance."

Caution: Avoid out gassing during the powder coat cycle when using marine grade castings

The above comment shows the overall value of using marine grade aluminum. However, the value of marine grade castings can be undermined if certain precautions are not taken to prevent out gassing during the powder coat cycle. The chemistry of the marine grade metal demands the foundry pour at a higher temperature into the sand molds. This higher temperature in contact with the moisture inherent in the sand causes more than a normal amount of steam. This moisture becomes trapped in the aluminum casting. During the heating and curing powder coat cycle, the moisture is pushed out of the casting and causes a bulky surface in the powder coat. For this reason, it is recommended that the powder coater operate a de-gassing step. This includes (1) running a pre-bake de-gassing cycle at 50–100 degrees higher than normal, and (2) running the pre-bake cycle at least 100 percent longer than the normal powder coat curing time. On heavier aluminum castings a much longer pre-bake cycle may be necessary. ❁



This flower panel in West Palm Beach, FL, shows flaking because of a poor coating job. But its marine grade castings are still shiny and coherent after eight years.

poor powder coating application, the net effect is still a poor looking rail. Compare this picture at left with the non-marine grade aluminum castings that have been on the ocean only 18 months (top of page 29). Marine grade castings on the ocean eight years with no corrosion pictured at left show the value of the proper base metal. Again, however, even the marine grade metal could do nothing to improve the original poor powder coating.

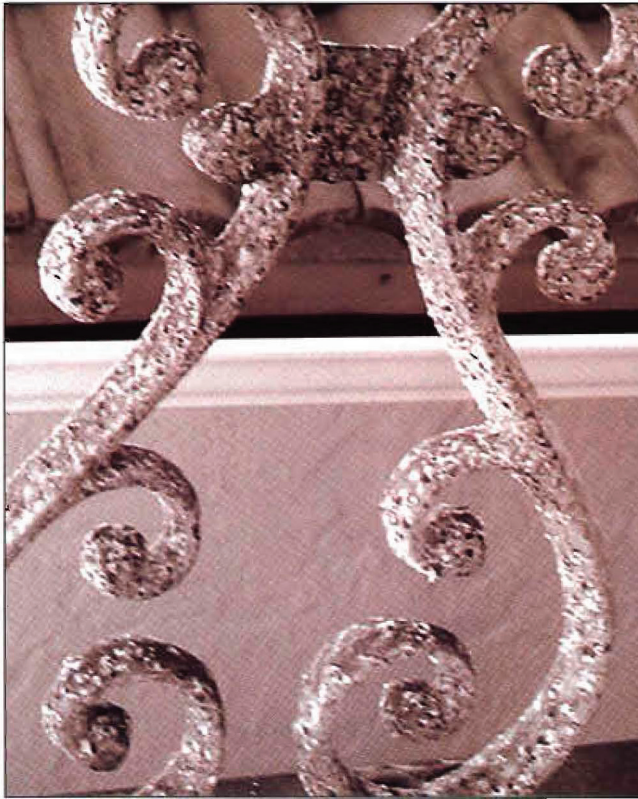
Best: Corrosion on marine grade castings with good coating application

A recent on-site survey of many copper-free marine grade castings that have been on the ocean between one and 3½ years shows the excellent results of combining marine grade castings with good powder coating applications. Shown below and on page 34, the castings are coherent and show no signs of corrosion or flaking.

When I visited one fabricator in Jupiter, FL and asked to visit job sites that have had marine grade metal for



This aluminum rail with marine grade aluminum cast collars also shows a coherent coating in excellent condition after three years on Florida's Intracoastal Waterway.



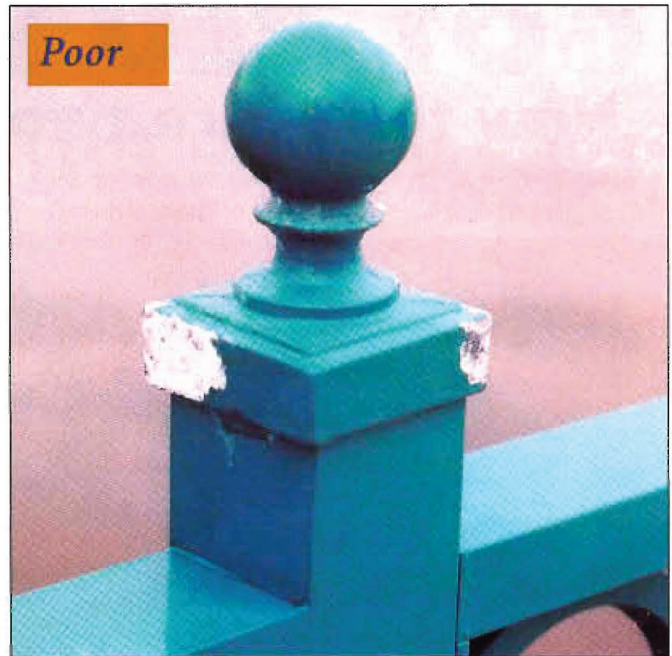
This scroll casting is not marine grade. It shows severe white corrosion after only 18 months in its ocean environment in Sarasota, FL. No coating remains.



This 12-year-old aluminum furniture in Dallas, TX, is also not marine grade. Even though it is not in a harsh marine environment, its powder coat is peeling and corrosion appears.

Corrosion on aluminum

Flaking and peeling occur on regular aluminum because air penetrates through the coating and corrodes the base metal. The devastation of the coating can occur rapidly when the job site is next to the ocean. Or it can take a much longer period of time in a more temperate climate. Either way, however, the castings will eventually show signs of corrosion. The scroll casting pictured at the top of this page has been on the ocean only 18 months and shows



This 2" ball cap is not marine grade. It shows chalk corrosion and flaking (starting at corners) after four years on the Indian River in Vero Beach, FL.

almost complete disintegration; whereas the aluminum furniture (pictured below it, bottom of page 29) is located in the more moderate environment of Dallas, TX. In this less harsh environment the aluminum held off significant corrosion for 10 years. The furniture has now been in the weather 12 years.

Poor: Corrosion on non-marine grade castings with sub-par powder coating application

Typical corrosion of non-marine aluminum castings is shown at left. The ball cap has been near the ocean for four years and shows the corrosion on the corner edges where only a thin layer of coating might have been applied. This edge with a thin coating enables the salt air to penetrate here first and begin the corrosion peeling action. The root cause of the white chalk aluminum corrosion is the residual amounts of copper that create a galvanic reaction with the aluminum base material.

Better: Corrosion on marine grade casting with poor powder coating application

Even the use of virgin metal with the correct marine grade chemistry, however, cannot cure the faults of a poor coating application. Pictured at the top of page 32 is a handrail installed near the ocean in Palm Beach, FL. For eight years the castings have been directly exposed to the wind and spray of the ocean. However, they are still shiny and coherent. This shiny and coherent surface indicates no galvanic corrosion has occurred as the marine metal has successfully resisted the salt air. But because of the

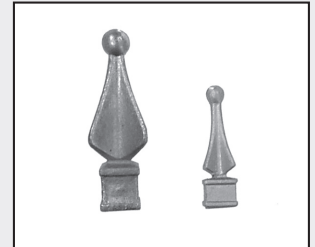


Ball Caps:

SQUARE HOLE SIZE	PART NO. AL 535/
1"	3410
1 1/2"	3415
2"	3420
2 1/2"	3425
3"	3430
4"	3440

Collars:

SQUARE HOLE SIZE	PART NO. AL 535/
1/2"	164
5/8"	165
3/4"	143
1"	140



		PART NO. AL 535/
BIG	3/4"	8264
SMALL	3/4"	634

Welding Wire for Allomet:



	PART NO. AL 535/
.030"	1030
.035"	1035

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 1LB SPOOLS

Eliminate your powder coat flaking problems.

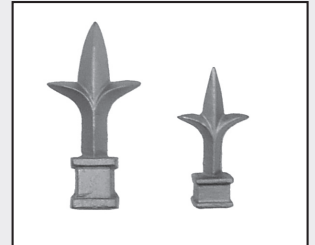


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Spear Points:



		PART NO. AL 535/
BIG	3/4"	8215
SMALL	3/4"	8223

Circles:

OUTER DIAMETER	PART NO. AL 535/
3 1/2"	7134
3 7/8"	7137
4"	7140
4 1/2"	7144
5 1/4"	7152
5 7/8"	7157

Post Caps:

SQUARE HOLE SIZE	PART NO. AL 535/
1"	3301
1 1/2"	3315
2"	3302
2 1/2"	3325
3"	3303
4"	3304
6"	3306

CORROSION RESISTANT ALUMINUM