IPA
INDUSTRIAL
PERFORATORS
ASSOCIATION

Summary Review

IPA Salt Spray Test

When specifying the use of metal for architectural applications designers have two primary choices, perforated metals or expanded metals. Both industries are represented by trade associations which promote the use of their respective products. The Expanded metal Manufacturers Association (EMMA) has been hard at work positioning its products in a favorable light to architects with claims of durability, flexibility and the claim of "no scrap". The Industrial Perforating Association (IPA) has also been hard at work positioning its products in the architectural marketplace.

Perforated materials offer a broader range of options than that of expanded metals. The geometry of openings, the range of thicknesses and the selection of raw materials itself, make perforated metal a popular choice of designers. The expanded metals industry has been busy positioning its products on a value proposition that cost per area is less than a perforated product of comparable open area and thickness. While this might be true base on market price it falls short when looking at the overall life cycle of their product.

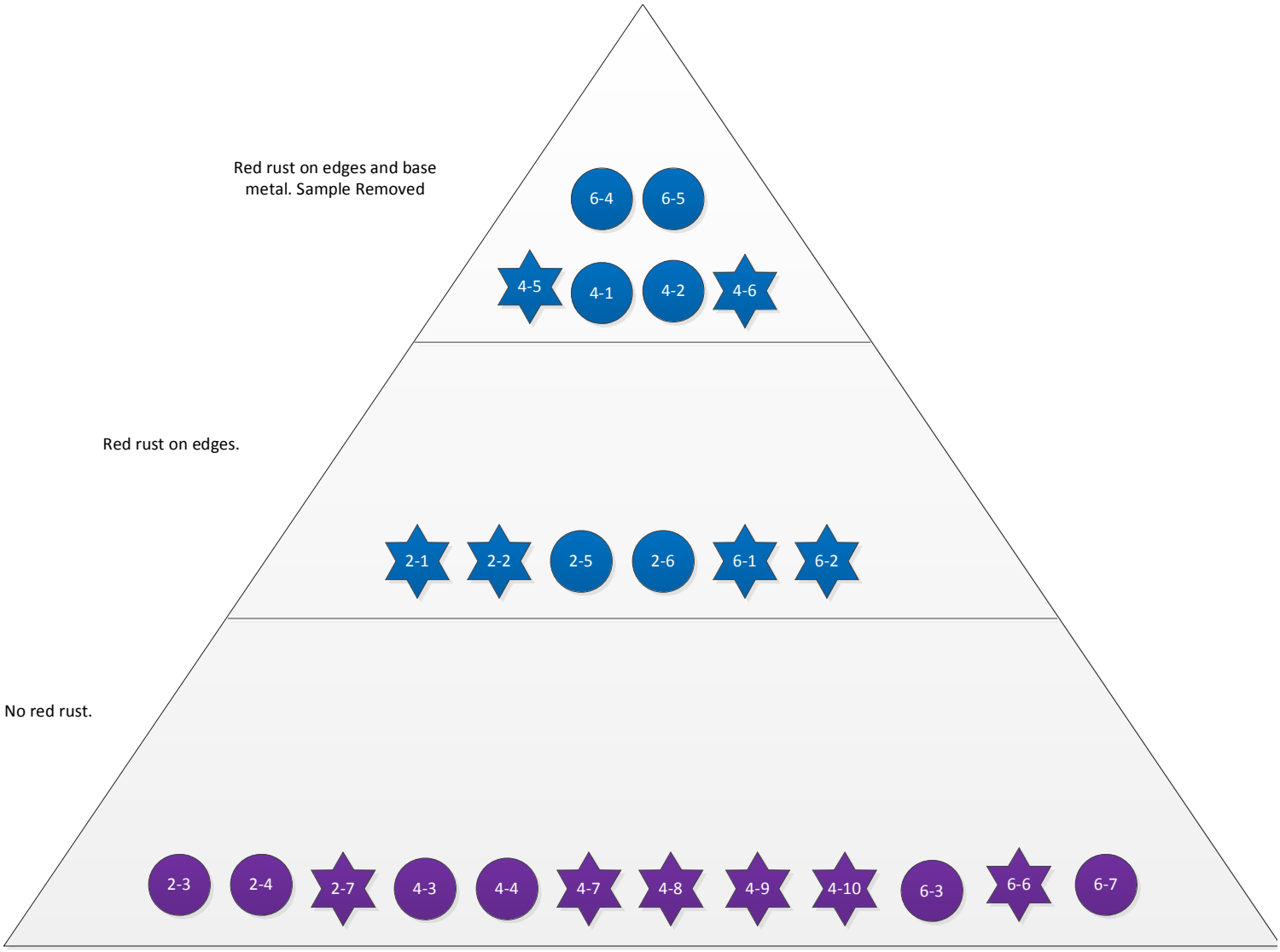
IPA membership has been speculated that the use of perforated metals in architectural applications will outperform the expanded metal products in durability and cost of ownership. In order to confirm this, the IPA set out to perform what is considered a standard corrosion analysis of metallic products called a Salt Spray Test. In this test regime the IPA accumulated two (2) separate samples of perforated metal and two (2) separate samples of expanded metals. Both groups of material contained a sample made of carbon steel and one of galvanized carbon steel. The sample configurations were selected to insure similar open area and material thickness. The groups of samples were electrostatically painted with thicknesses of 2, 4 and 6 mil thicknesses.

Samples were exposed to a 5% Salt Fog Test at 95 deg. F in accordance with ASTM B117-07a for 600 hours. (See attached test reports). In summary; the carbon steel samples of both perforated and expanded metal began to experience corrosion within the first 24 hours. Within 48 hours, all carbon steel parts as well as a population of galvanized expanded metal products had exhibited enough reactivity to be removed from the test group. Continued exposure resulted in elimination of the remaining galvanized expanded metal parts at the 72 hour mark. The first failure in a galvanized perforated product occurred at 240 hrs. During the rest of the test intervals the samples were removed due to corrosion at the 360, 384 and 552 hour mark. The final perforated sample was removed at the 600 hour mark after exhibiting signs of rust.

It becomes clear that a galvanized product outperforms an uncoated carbon steel base metal, regardless of what type of manufacturing process is used when treatment is with an electrostatically deposited paint. One could deduce that the increased unprotected surface area of carbon steel makes it more vulnerable to attack from the salt spray. The galvanized coating adds an additional barrier to protect the base metal. What is also clear is that when long term environmental exposure is a design criteria, perforated metal is the clear winner in total cost of ownership because of longer product life and lower maintenance costs for repairs due to rust. Observations of the rust formation indicated that the sharp corners ("V") of the expanded metal were consistent locations for the initial formation of rust. This would be consistent with the painting industries findings on the application of electrostatically applied paints. It appears that a phenomenon referred to as "Faraday's Cage" inhibits of attraction of charged paint particles in areas such as sharp corners or blind holes.

When fielding inquiries for architectural applications it is advisable to inquire as to the physical location of any painted products. When a product is identified for outdoor use, the perforator should expound upon the virtues of perforated product over expanded metal from a performance perspective. It is short sighted to consider merely price when determining value of a product and perforated metal is a product that offers added design flexibility as well as long term performance; a value proposition that should be hard to beat.

SALT SPRAY TEST RESULTS
INTERVAL – 24 HRS



X – Paint thickness in mils.
Y – Sample number from report.

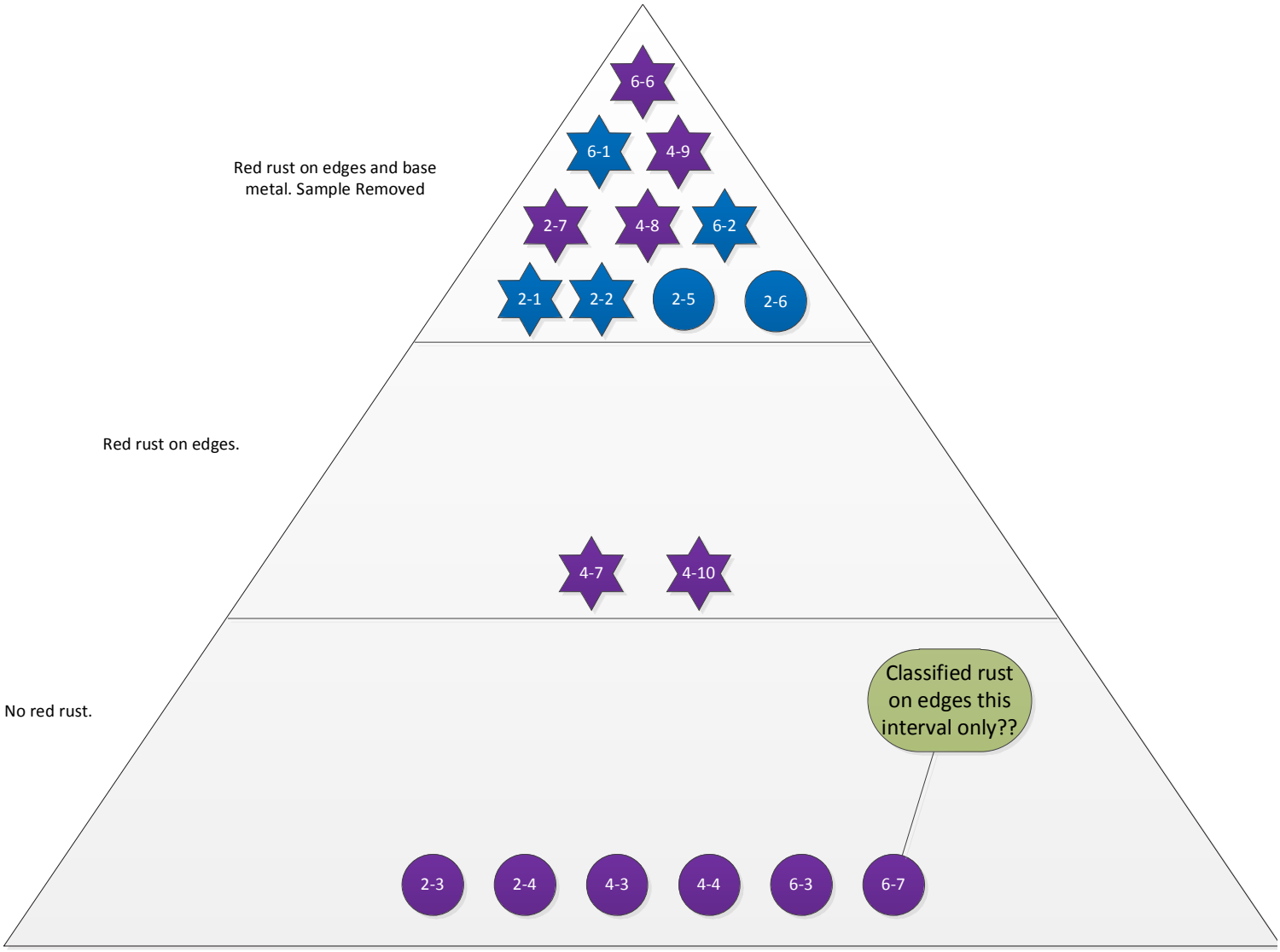
X-Y — Perforated metal. 18 ga. cold rolled. 3/32" hole on 5/32" centers, staggered, 47.4% open area.

X-Y — Perforated metal. 16 ga. galvanized. 1/8" hole on 3/16" centers, staggered, 40.3% open area.

X-Y — Expanded metal. 20 ga. Cold rolled. Diamond opening,0.094" x 0.688", 35% open area.

X-Y — Expanded metal. 20 ga. Galvanized. Diamond opening,0.118" x 0.377", 40.1% open area.

SALT SPRAY TEST RESULTS
INTERVAL – 48 HRS



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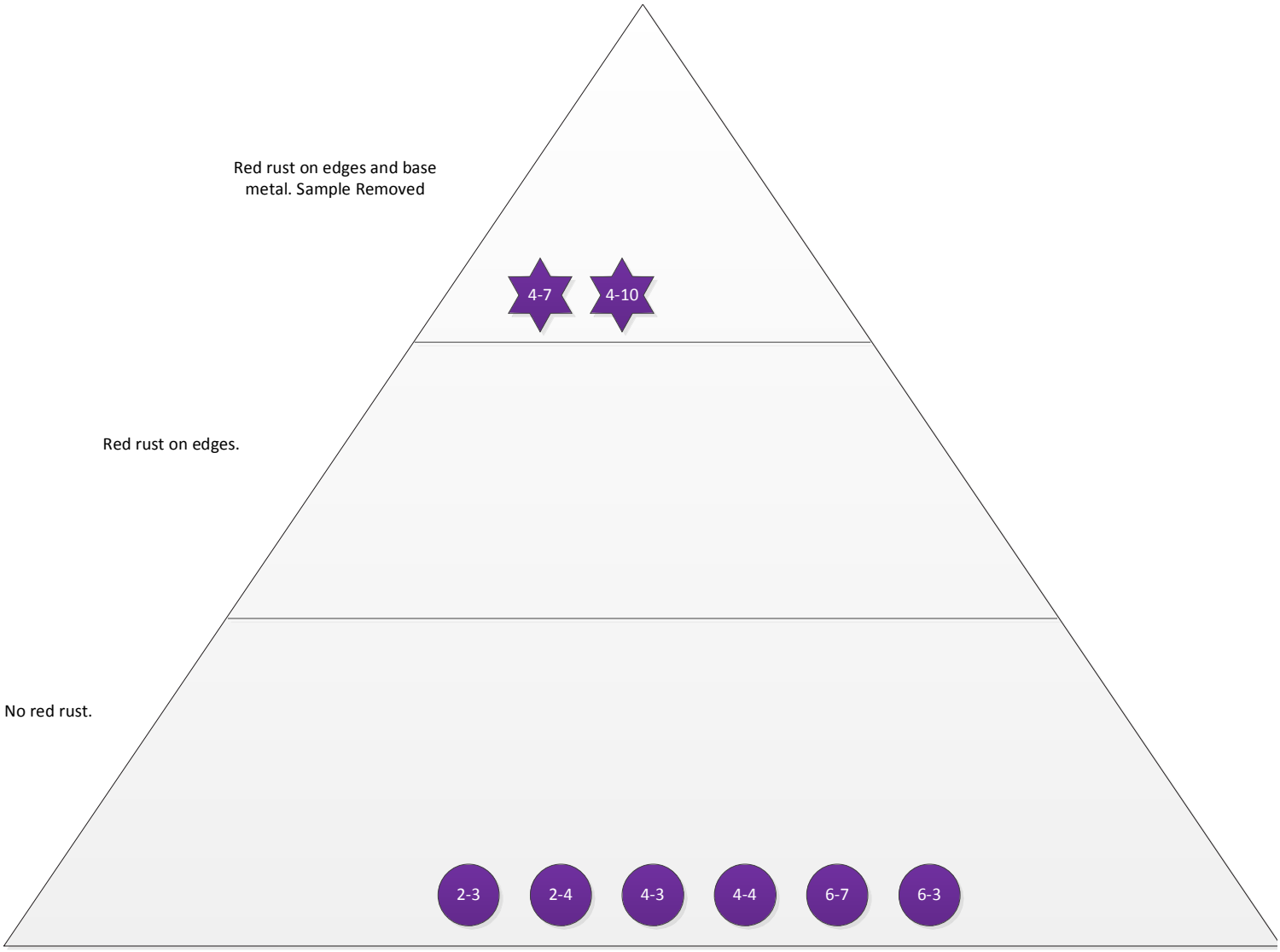
SALT SPRAY TEST RESULTS
INTERVAL – 72 HRS



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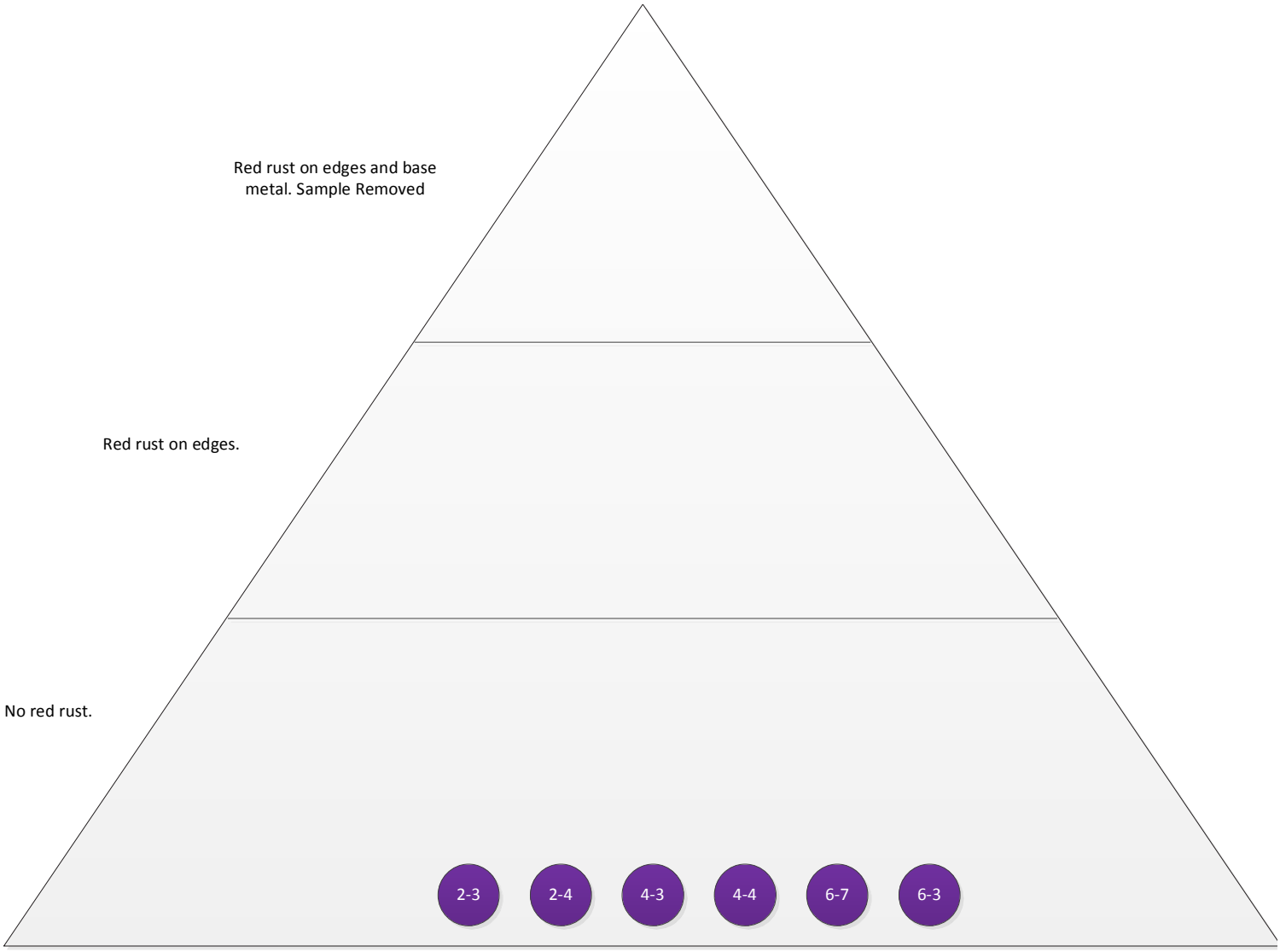
SALT SPRAY TEST RESULTS
INTERVAL – 216 HRS



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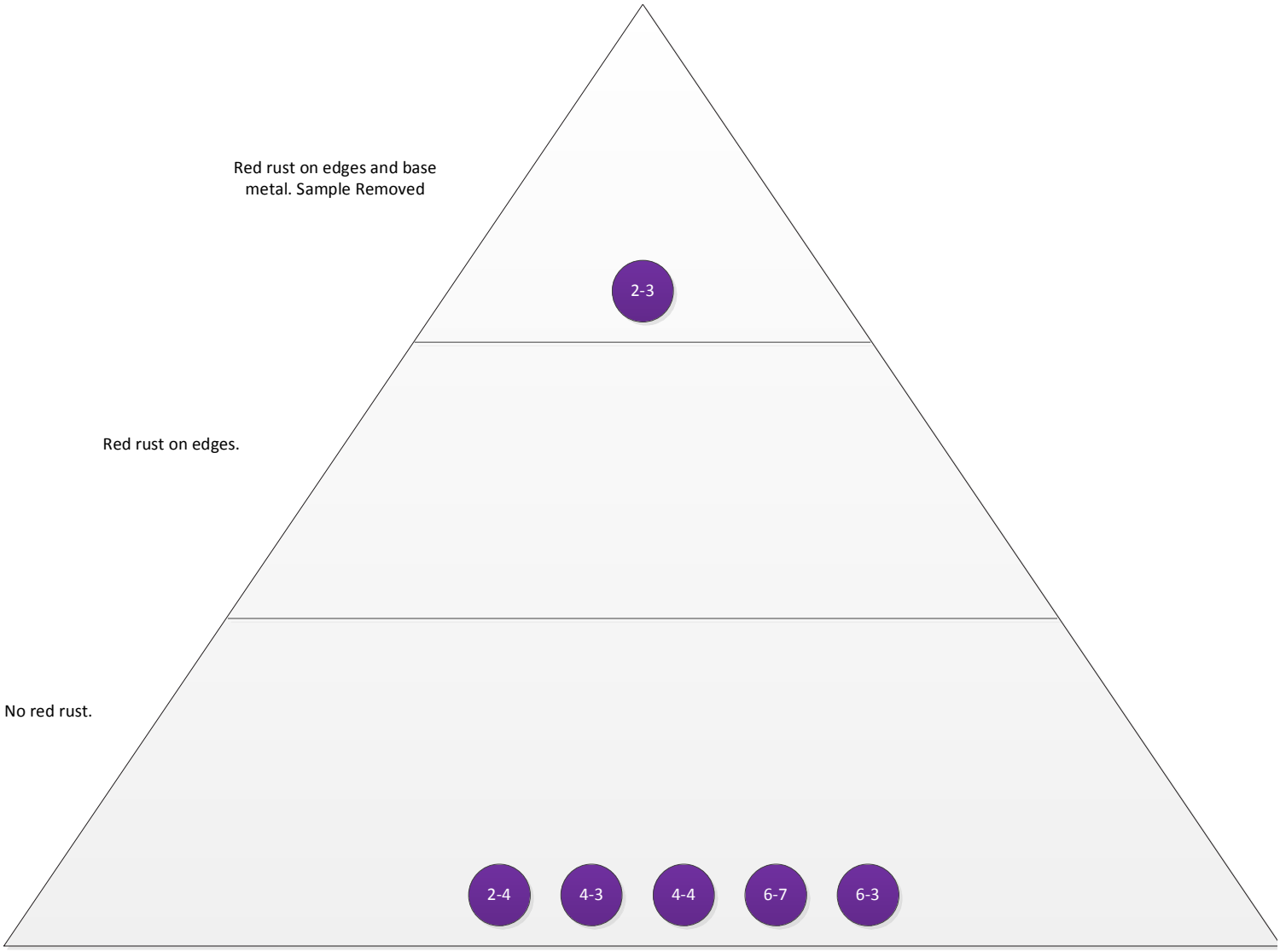
SALT SPRAY TEST RESULTS
INTERVAL – 240 HRS



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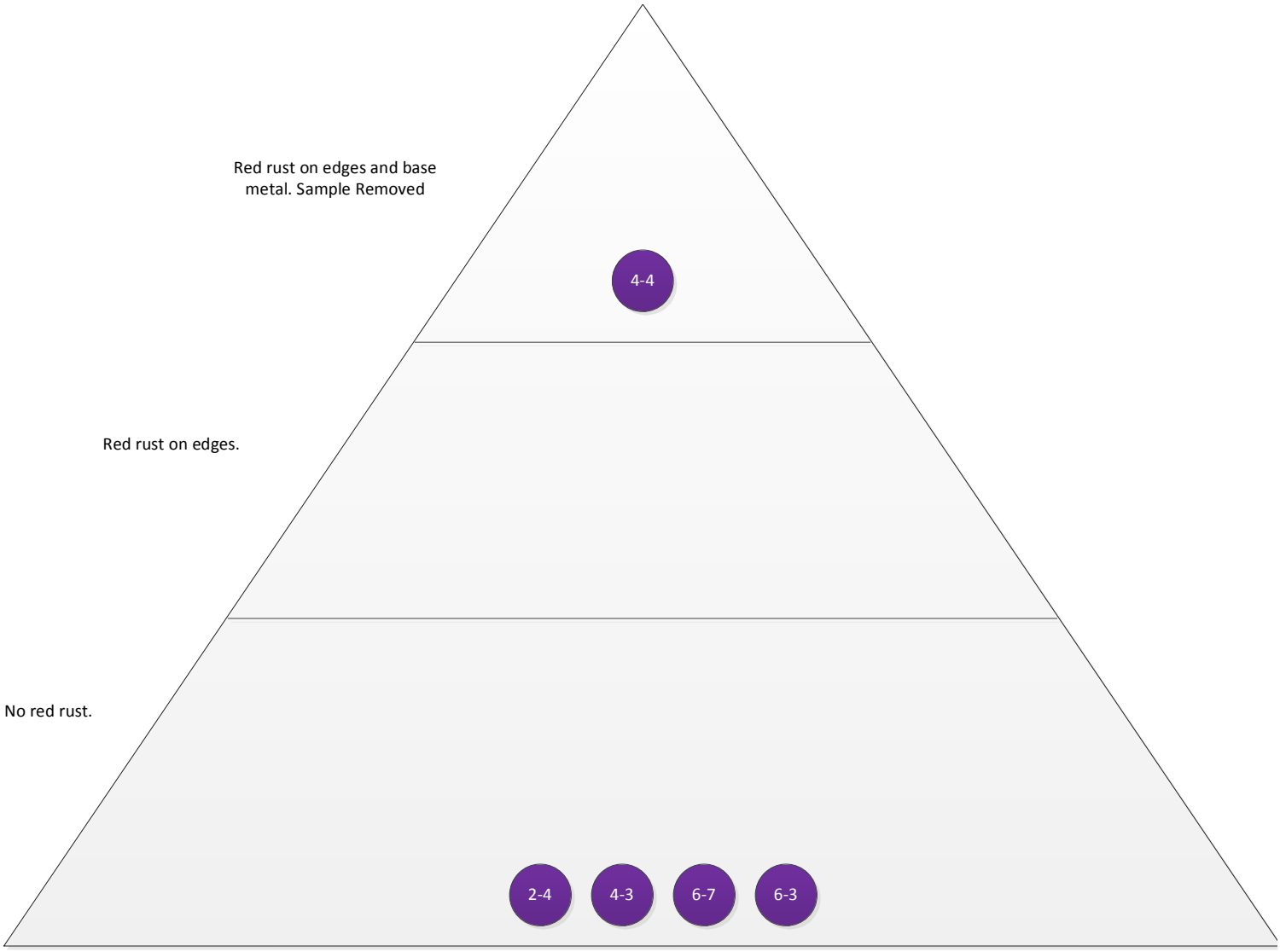
SALT SPRAY TEST RESULTS
INTERVAL – 360 HRS



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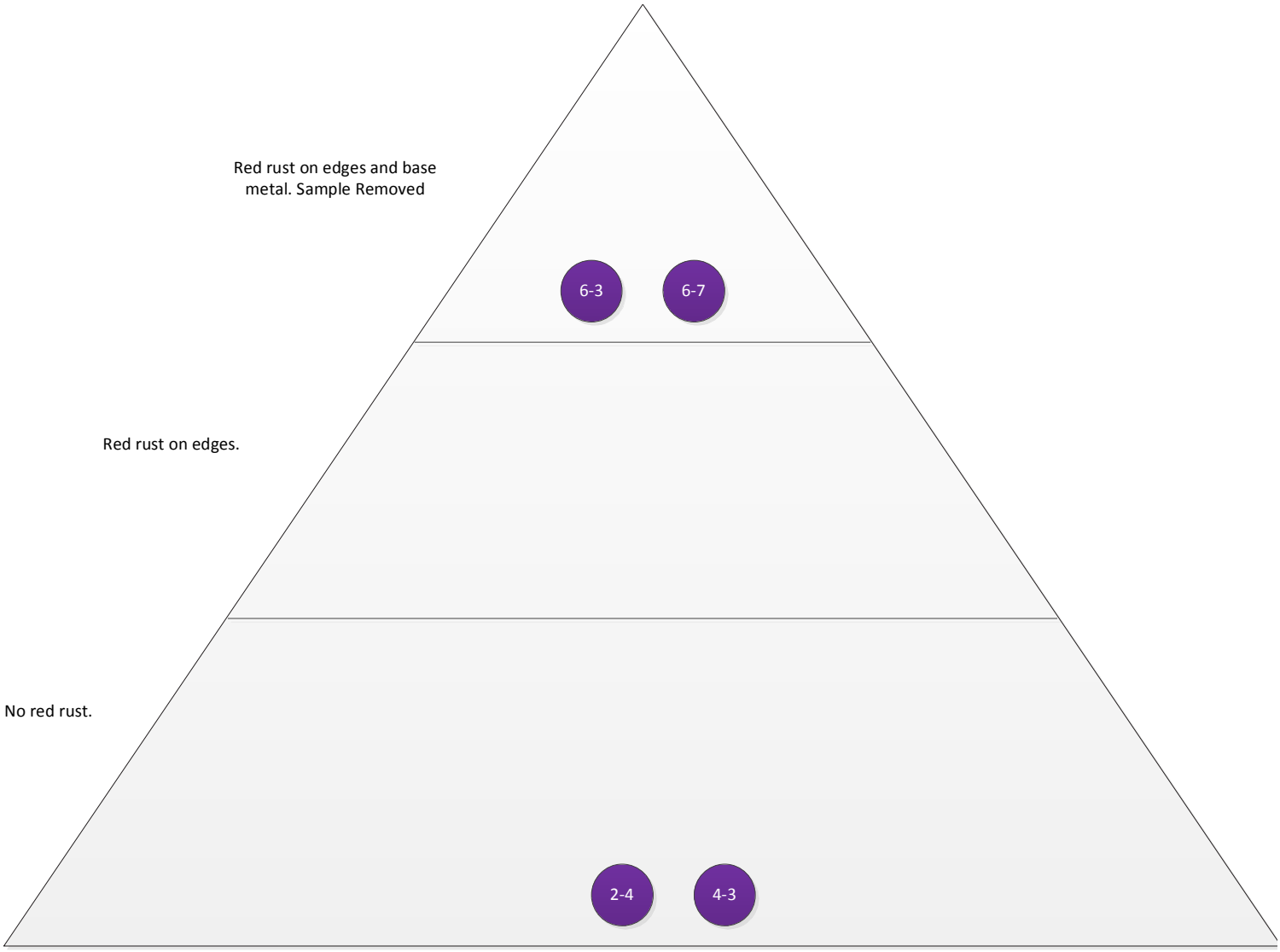
SALT SPRAY TEST RESULTS
INTERVAL – 384 HRS



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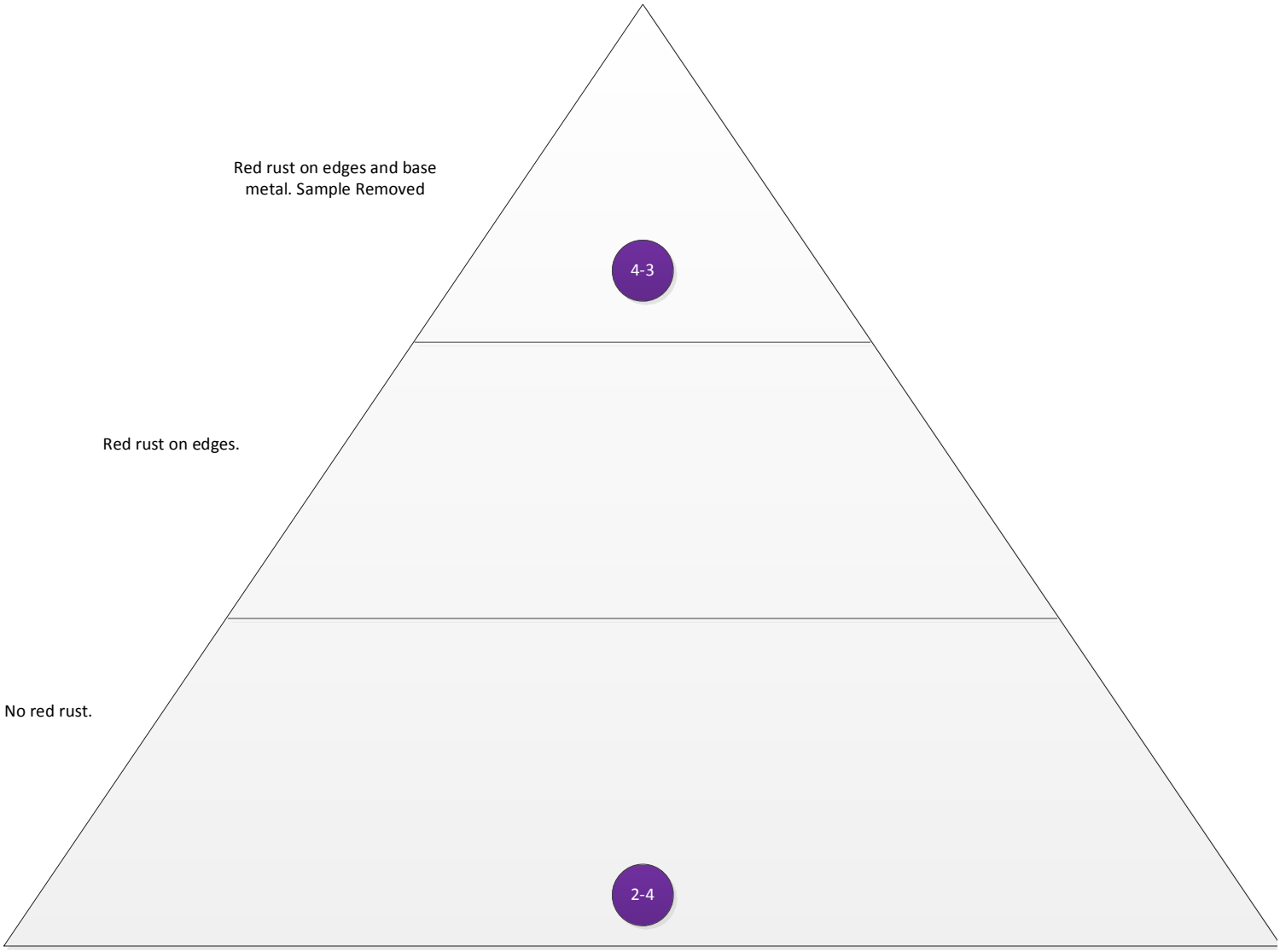
SALT SPRAY TEST RESULTS
INTERVAL – 552 HRS



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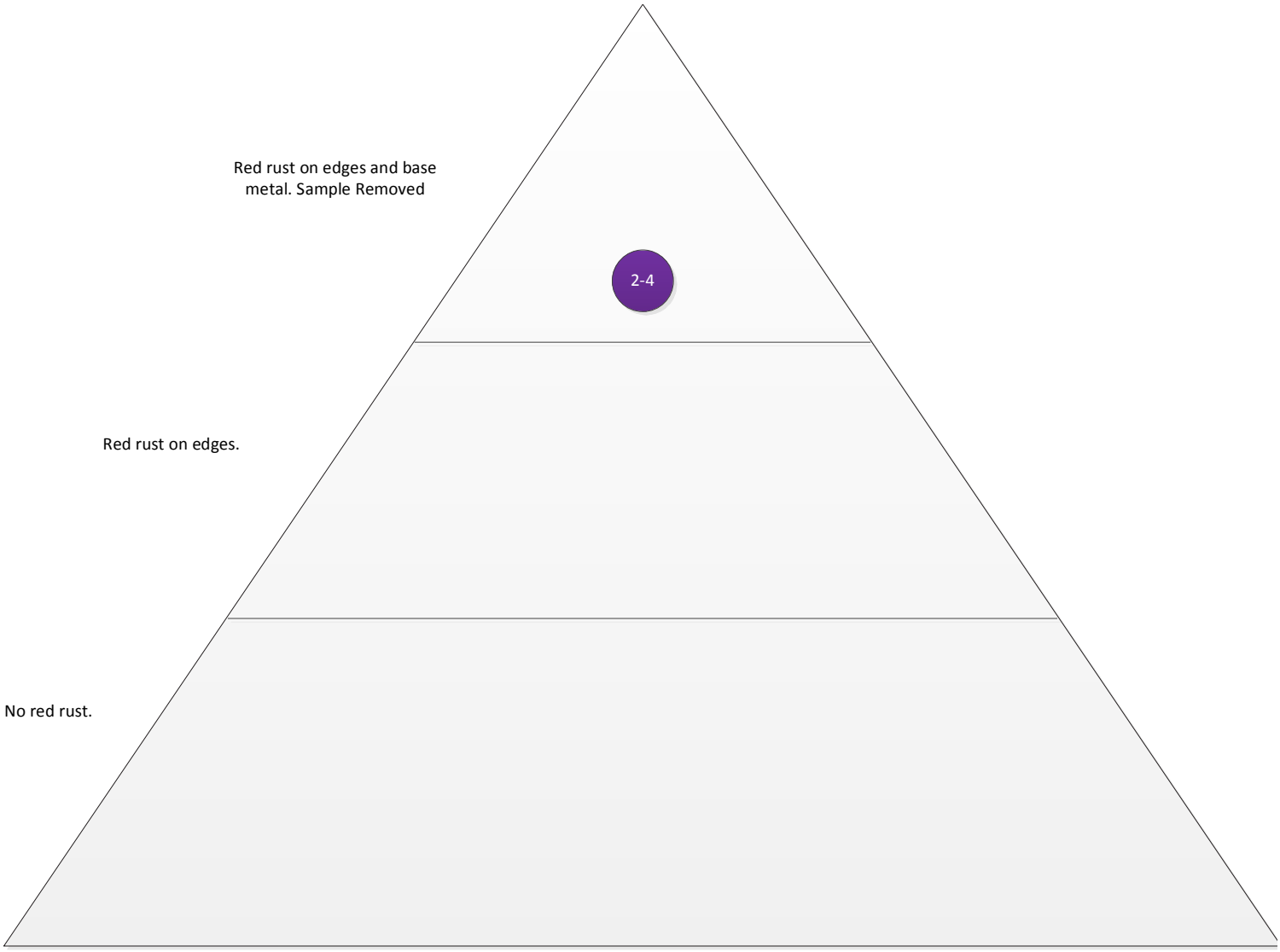
SALT SPRAY TEST RESULTS
INTERVAL – 600 HRS



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