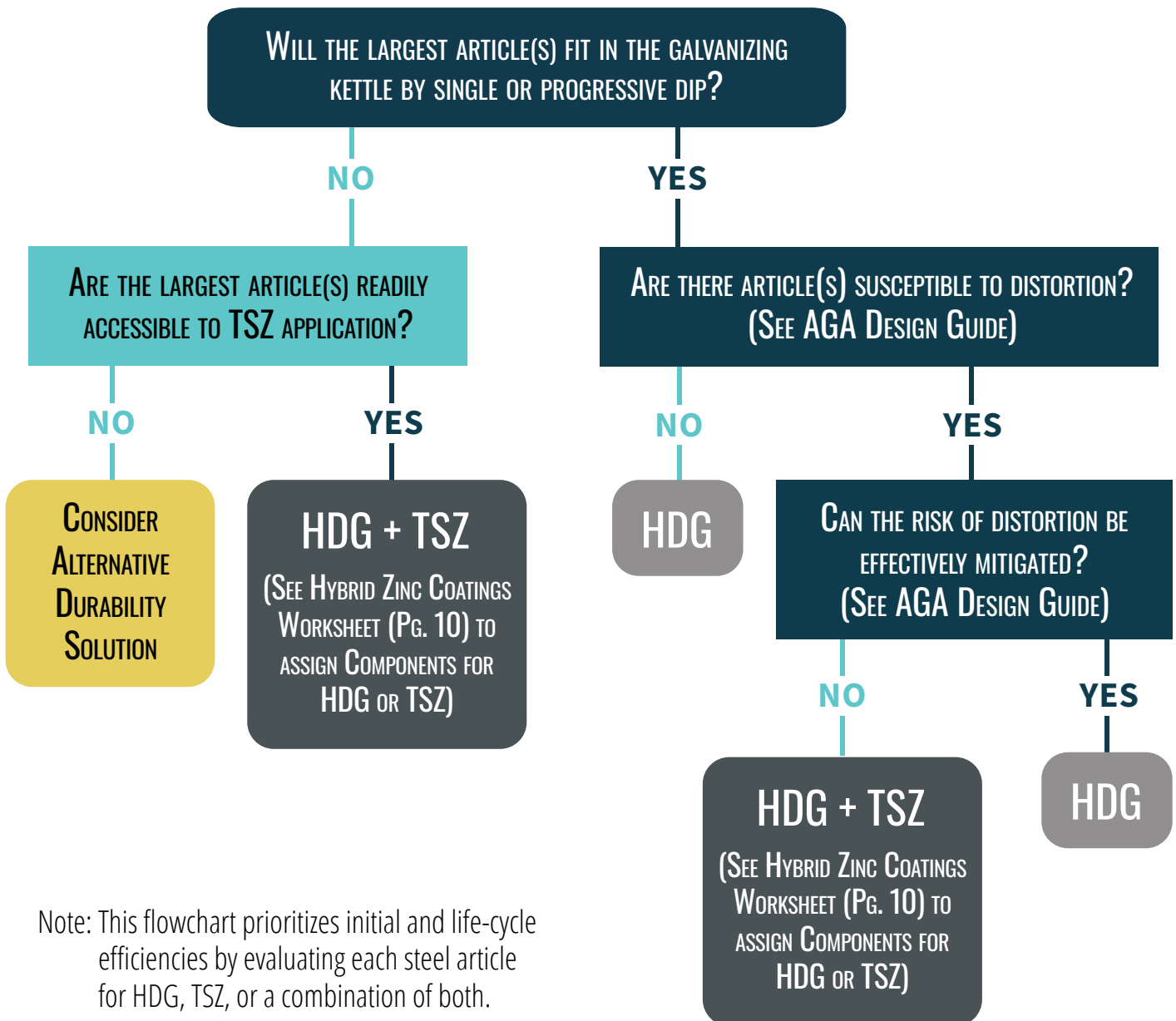


Hybrid Zinc Coating (HDG + TSZ) Selection Flowchart



Note: This flowchart prioritizes initial and life-cycle efficiencies by evaluating each steel article for HDG, TSZ, or a combination of both.

Hybrid Zinc Coatings Worksheet

The following worksheet is designed to be used in conjunction with the flow chart (page 9). This worksheet can also be downloaded as a standalone, single-page, fillable form with flowchart from the AGA website: galvanizeit.org/hybridzinccoatingsws

Physical Characteristics of Individual Steel Articles

The following questions relate to the size, shape, configuration, and application of each steel article to assess whether HDG, TSZ, or a combination of both would be the best fit to maximize your project's cost efficiency.

Questions		Answers			Notes
1	What are the dimensions of the largest article?	___ L	___ W	___ H	Ideally, all steel articles are designed to fit in the galvanizing kettle in a single dip (immersion). Components larger than the kettle may be candidates for progressive dipping (see Q4). A TSZ coating is ideal for larger components that cannot fit in the kettle in a single dip and cannot be progressively dipped.
1a	What is the largest length steel article?	___ L			
1b	What is the largest width steel article?		___ W		
1c	What is the largest depth (height) steel article?			___ H	
2	What is the size of the galvanizing kettle?	___ L	___ W	___ H	Typical kettle sizes range from 30-60' L x 5-8' W x 6-12' D (9-18 m L, 1.5-2.4 m W, 1.8-3.6 m D). The average galvanizing kettle size in North America is 40' L x 6' W x 8' D (12 m L x 1.8 m W x 2.4 m D). Kettle sizes for all AGA member galvanizers can be found on the AGA website: galvanizeit.org/galvanizers .
3	Are all dimensions listed in Q1 < Q2?	___ Yes ___ No			If YES, HDG is an ideal and cost efficient coating for all steel articles (Skip Q3a). If NO, Q4 will determine whether progressive dipping can be considered. It is important to verify this with the galvanizer to ensure the material handling capabilities of the galvanizer.
3a	Are the steel articles candidates for progressive dipping? (see Notes)	___ Yes ___ No			Articles up to 90' in length have been successfully hot-dip galvanized by employing a progressive dip process (dependent on kettle size). The AGA has developed simple reference charts to determine if this is possible (galvanizeit.org/PDcharts) and a more comprehensive progressive dip calculator (galvanizeit.org/PDcalculator). See also: galvanizeit.org/knowledgebase/article/determining-overcoming-the-size-limitations-of-hot-dip-galvanizing .
4	Is the structure susceptible to distortion? (see Notes)	___ Yes ___ No			Some fabricated structures and assemblies may distort at the galvanizing temperature as a result of relieving stresses induced during steel production and in subsequent fabricating operations. The following AGA Knowledgebase article highlights particular fabrications that are susceptible and design/fabrication techniques to mitigate distortion/warpage risk: galvanizeit.org/knowledgebase/article/warping-and-distortion .
5	Does the steel design include tight recessed areas? (nooks, crannies, threads for connections)	___ Yes ___ No			Tight recessed areas and other steel components can be difficult to blast clean or spray with the thermal spray gun. These components are ideally hot-dip galvanized depending on answers to Q1-Q4. See "Accessibility" for more information.
6	Is the article readily accessible for TSZ application?	___ Yes ___ No			Large, flat, uniform surfaces which are readily accessible are ideal for TSZ. Meanwhile, some design factors can make other items difficult to blast clean or spray with the thermal gun (i.e. large, flat surfaces and not hollow fabrications, small parts with many edges, etc.). See "Accessibility" for more information.
7	Does the project require surfaces with increased abrasion resistance?	___ Yes ___ No			If areas traditionally vulnerable during shipping, handling, and installation require increased durability and abrasion resistance, galvanizing is the preferred coating. Piles, posts, walkways and other components to be driven into the ground also benefit from galvanizing's superior abrasion resistance.

Schedule Impacts Considerations

The following questions relate to factors that may influence the project schedule. If accelerated timelines and/or hard deadlines are required it is important to consider the following factors when choosing to hot-dip galvanize, apply thermal-spray zinc, or use a hybrid coating solution utilizing both coating systems.

Questions		Answers			Notes
8	When is the steel required to be delivered to the job site? (i.e. accelerated timeline?, hard deadlines?)	Project Delivery Date	Galvanizer Meet Delivery	TSZ Applicator Meet Delivery	Applying multiple coatings will increase the project timeline. It is important to verify with the coating facilities directly that they can accommodate the required project schedule.
		___	Yes / No	Yes / No	
9	Does the fabricator offer in-house TSZ?	___ Yes ___ No			If the steel fabricator offers in-house TSZ capabilities this can shorten the project delivery schedule by limiting transportation between coating facilities.
10	If the project includes slip-critical connections, which are acceptable for design?	___ Class A/C ___ Class B ___ Class D			HDG and TSZ have different established friction properties as listed within RCSC and AASHTO specifications. Use of mixed connections or Class D may require project-specific testing prior to erection.