
Chapter 296-835 WAC
Safety Standards for Dipping and Coating Operations (Dip Tanks)
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This book contains rules for Safety Standards for dipping and coating operations (Dip Tanks), as adopted under the Washington Industrial Safety and Health Act of 1973 (Chapter 49.17 RCW).

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Chapter 296-835 WAC DIPPING AND COATING OPERATIONS (DIP TANKS)

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WAC 296-835-099 Definitions.

ACGIH. American Conference of Governmental Industrial Hygienists.

Adjacent area. Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

ANSI. American National Standards Institute.

Approved. Approved or listed by a nationally recognized testing laboratory. Refer to federal regulation 29 C.F.R. 1910.7, for definition of nationally recognized testing laboratory.

Autoignition temperature. The minimum temperature required to cause self-sustained combustion without any other source of heat.

Detearing. A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

Dip tank. A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

Flammable liquid. Any liquid having a flashpoint at or below 199.4°F (93°C). Flammable liquids are divided into four categories as follows:

- (a) Category 1 shall include liquids having flashpoints below 73.4°F (23°C) and having a boiling point at or below 95°F (35°C).
- (b) Category 2 shall include liquids having flashpoints below 73.4°F (23°C) and having a boiling point above 95°F (35°C).
- (c) Category 3 shall include liquids having flashpoints at or above 73.4°F (23°C) and at or below 140°F (60°C). When a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100°F (37.8°C).
- (d) Category 4 shall include liquids having flashpoints above 140°F (60°C) and at or below 199.4°F (93°C). When a Category 4 flammable liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100°F (37.8°C).
- (e) When liquid with a flashpoint greater than 199.4°F (93°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 4 flammable liquid.

Flashpoint. The minimum temperature at which a liquid gives off a vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

- (a) The flashpoint of liquids having a viscosity less than 45 Saybolt universal second(s) at 100°F (37.8°C) and a flashpoint below 175°F (79.4°C) shall be determined in accordance with the Standard Method of Test for Flashpoint by the Tag Closed Tester, ASTM D-56-69 (incorporated by reference; WAC [296-901-14024](#), Appendix B—Physical hazard criteria).

- (b) The flashpoints of liquids having a viscosity of 45 Saybolt universal second(s) or more at 175°F (79.4°C) or higher shall be determined in accordance with the Standard Method of Test for Flashpoint by the Pensky Martens Closed Tester, ASTM D-93-69 (incorporated by reference; WAC 296-901-14024, Appendix B—Physical hazard criteria).

Lower flammable limit. The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

NFPA. National Fire Protection Association.

Vapor area Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

You. The employer. See the definition of employer in the safety and health core rules, WAC [296-800-370](#).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-099, filed 09/05/2017, effective 10/06/2017.]

WAC 296-835-100 Scope.

Important:

A dip tank is a container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

EXEMPTION:

Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

- (1) A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:
 - (a) Clean an object;
 - (b) Coat an object;
 - (c) Alter the surface of an object; or
 - (d) Change the character of an object.
- (2) Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

- (a) Paint dipping;
- (b) Electroplating;
- (c) Anodizing;
- (d) Pickling;
- (e) Quenching;
- (f) Tanning;
- (g) Degreasing;
- (h) Stripping;
- (i) Cleaning;
- (j) Dyeing;
- (k) Flow coating;
- (l) Roll coating.

Reference: You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See personal protective equipment (PPE), WAC [296-800-160](#), in the core rules, chapter [296-800](#) WAC.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-100, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-100, filed 07/17/02, effective 10/01/02.]

WAC 296-835-110 General requirements.

Summary

Your responsibility: Safeguard employees working with dip tanks.

<i>You must meet the requirements...</i>	<i>in this section</i>
Construction	
Construct safe dip tanks	WAC 296-835-11005
Ventilation	
Provide proper ventilation for the vapor area	WAC 296-835-11010
Take additional precautions if you recirculate ventilation system exhaust air into the workplace	WAC 296-835-11015
Take additional precautions when using an exhaust hood	WAC 296-835-11020
Inspection	
Periodic inspect your dip tanks and associated equipment and correct any deficiencies	WAC 296-835-11025
First Aid	
Make sure employees working near dip tanks know appropriate first-aid procedures	WAC 296-835-11030
Cleaning	
Prepare dip tanks before cleaning	WAC 296-835-11035
Cyanide	
Safeguard cyanide tanks	WAC 296-835-11040
Welding	
Protect employees during welding, burning, or other work using open flames	WAC 296-835-11045
Liquid Harmful to Skin	
Protect employees that use liquids that may burn, irritate, or otherwise harm the skin	WAC 296-835-11050

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-110, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-110, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11005 Construct safe dip tanks.

You must make sure dip tanks, including any drain boards, are strong enough to support the expected load.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11005, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11005, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11010 Provide proper ventilation for the vapor area.

- (1) You must make sure mechanical ventilation meets the requirements of one or more of the following standards:
 - (a) NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids;
 - (b) ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995);
 - (c) ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

- (2) You must limit the vapor area to the smallest practical space by using mechanical ventilation.
- (3) You must keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL).
- (4) You must make sure mechanical ventilation draws the flow of air into a hood or exhaust duct.
- (5) You must have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:
 - (a) Fire;
 - (b) Explosion; or
 - (c) Potentially hazardous chemical reaction.

Reference: You need to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Air contaminants, WAC [296-62-075](#) through [296-62-07515](#).

Note: You may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods you choose has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11010, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 02-15-102, § 296-835-11010, filed 7/17/02, effective 10/1/02.]

WAC 296-835-11015 Take additional precautions if you recirculate ventilation system exhaust air into the workplace.

Important:

This section applies if exhaust air from dipping or coating operations that use flammable liquids with flashpoints greater than 199.4°F (93°C) is recirculated back into the work environment.

- (1) You must only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees.
- (2) You must make sure any exhaust system that recirculates air into the workplace:
 - (a) Passes the air through a device that removes contaminants;
 - (b) Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL;
 - (c) Monitors the concentration of vapor from flammable liquids or liquids with flashpoints greater than 199.4°F (93°C) with approved equipment.

Note:

1. *The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workspace.*
2. *Most substances will pose a health hazard at a concentration far below 25% of its LFL.*

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11015, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060, 14-07-086 (Order 13-08), § 296-835-11015, filed 03/18/14, effective 05/01/14. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11015, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11020 Take additional precautions when using an exhaust hood.

You must sure each room with an exhaust hood has a source of outside air that:

- (1) Enters the room in a way that will not interfere with the function of the hood; and
- (2) Replaces at least 90% of the air taken in through the hood.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11020, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11020, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11025 Periodically inspect your dip tanks and associated equipment and correct any deficiencies.

- (1) You must inspect or test your dip tanks and associated equipment periodically, including:
 - (a) Covers;
 - (b) Overflow pipes;
 - (c) Bottom drains and valves;
 - (d) Electrical wiring, equipment, and grounding connections;
 - (e) Ventilating systems;
 - (f) Fire extinguishing equipment.
- (2) You must inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:
 - (a) At least quarterly during operation;
 - (b) Prior to operation after a prolonged shutdown;
 - (c) You must promptly fix any deficiencies found.

Note:

1. *To assist you in tracking your inspections and actions taken from those inspections, you may want to keep a written record.*
2. *It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.*

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11025, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11025, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11030 Make sure employees working near dip tanks know appropriate first-aid procedures.

You must make sure your employees know the appropriate first-aid procedures for the hazards of your dipping and coating operations.

Note:

1. *First-aid procedures are contained in the Safety Data Sheet (SDS) for the chemicals used in the dip tank.*
2. *First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered “readily available” as required by WAC [296-800-15020](#).*

Reference: *There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC [296-800-150](#), and chapter [296-901](#) WAC, Globally harmonized system for hazard communication, in the safety and health core rules, chapter [296-800](#) WAC.*

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11030, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-02-066 (Order 16-30), § 296-835-11030, filed 01/03/2017, effective 02/04/17. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11030, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11035 Prepare dip tanks before cleaning.

- (1) You must drain the contents of the tank and open any cleanout doors.
- (2) You must ventilate the tank to clear any accumulated hazardous vapors.

Reference: *There may be requirements that apply before an employee enters a dip tank. See chapter [296-809](#) WAC, Confined spaces.*

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11035, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-835-11035, filed 01/24/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11035, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11040 Safeguard cyanide tanks.

You must provide a dike or other safeguard(s) to prevent cyanide from mixing with an acid if a dip tank fails.

Note: This would also apply to spills or other means by which cyanide could come in contact with an acid in sufficient quantity to produce a hazardous gas.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11040, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11040, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11045 Protect employees during welding, burning, or other work using open flames.

You must make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:

- (1) Welding;
- (2) Burning; or
- (3) Open flames.

Reference: There are additional requirements for this type of work. See [Welding, cutting and brazing, chapter 296-24 WAC, Part I](#), and [Respiratory protection, chapter 296-842 WAC](#).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11045, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-03-093 (Order 04-41), § 296-835-11045, filed 01/18/05, effective 03/01/05. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11045, filed 07/17/02, effective 10/01/02.]

WAC 296-835-11050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.

- (1) You must make sure washing facilities, including hot water, are available for every 10 employees that work with dip tank liquids.
- (2) You must satisfy medical requirements:
 - (a) Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person.
 - (b) Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work.
 - (c) Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

Note:

1. *Periodic means on a yearly basis unless otherwise indicated.*
2. *Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.*

- (3) You must provide lockers or other storage space to prevent contamination of street clothes.

Reference: You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See Personal Protective Equipment (PPE), WAC [296-800-160](#), in the safety and health core rules, chapter [296-800](#) WAC.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-11050, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-11050, filed 07/17/02, effective 10/01/02.]

WAC 296-835-120 Additional requirements for dip tanks using flammable liquids or liquids with flashpoints greater than 199.4°F (93°C).

Summary

Important:
<i>This section applies to flammable liquids or liquids with flashpoints greater than 199.4°F (93.3°C) or higher if you:</i>
<ol style="list-style-type: none"> 1. <i>Heat the liquid; and</i> 2. <i>Dip a heated object in the tank.</i>

<i>Reference: Store flammable liquids or liquids with a flashpoint greater than 199.4°F (93°C) in accordance with , WAC 296-24-330, in the general safety and health standards.</i>

Your responsibility: Safeguard employees working with dip tanks containing flammable liquids or liquids with a flashpoint greater than 199.4°F (93°C).

You must meet the requirements...	in this section
Construction	
Include additional safeguards when constructing dip tanks	WAC 296-835-12005
Provide overflow pipes	WAC 296-835-12010
Provide bottom drains	WAC 296-835-12015
Fire Protection	
Provide fire protection in the vapor area	WAC 296-835-12020
Provide additional fire protection for large dip tanks	WAC 296-835-12025
Electrical Wiring and Equipment and Sources of Ignition	
Prevent static electricity sparks or arcs when adding liquids to a dip tank	WAC 296-835-12035
Control ignition sources	WAC 296-835-12040
Keep the area around dip tanks clear of combustible material and properly dispose of waste	WAC 296-835-12050

<i>You must meet the requirements...</i>	<i>in this section</i>
Heating Liquid	
Make sure heating the liquid in your dip tanks does not cause a fire	WAC 296-835-12055
Heating Drying	
Make sure a hearing system used for drying objects does not cause a fire	WAC 296-835-12060
Conveyors	
Make sure the conveyor systems are safe	WAC 296-835-12065

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-120, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060, 14-07-086 (Order 13-08), § 296-835-120, filed 03/18/14, effective 05/01/14. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-120, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12005 Include additional safeguards when constructing dip tanks.

- (1) You must make sure the dip tank, drain boards (if provided), and supports, are made of noncombustible material.
- (2) You must make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-12005, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12005, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12010 Provide overflow pipes.

- (1) You must provide an overflow pipe on dip tanks that:
 - (a) Hold more than 150 gallons of liquid; or
 - (b) Have more than 10 square feet of liquid surface area.
- (2) You must make sure the overflow pipe is:
 - (a) Properly trapped;
 - (b) Able to prevent the dip tank from overflowing;
 - (c) 3 inches or more (7.6 cm) in diameter;
 - (d) Discharged to a safe location.

Note: Discharged to a safe location could be a:

1. Safe location outside the building; or
2. Closed, properly vented salvage tank that can hold more than the dip tank.

- (3) You must make sure the bottom of the overflow pipe is at least 6 inches (15.2 cm) below the top of the tank.

Note: The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12010, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12010, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12015 Provide bottom drains.

EXEMPTION:

A bottom drain is not required if:

- 1. The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping; or*
- 2. The dip tank has an automatic closing cover that meets the requirements of WAC 296-835-12025.*

- (1) You must provide a bottom drain on all dip tanks that hold more than 500 gallons of liquid.
- (2) You must make sure the bottom drain:
- (a) Is properly trapped;
 - (b) Will empty the dip tank during a fire;
 - (c) Has pipes large enough to empty the tank within 5 minutes;
 - (d) Uses automatic pumps if gravity draining is not practical;
 - (e) Is capable of both manual and automatic operation;
 - (f) Discharges to a safe location.

Note: Discharges to a safe location could be a:

- 1. Safe location outside the building; or*
- 2. Closed, properly vented salvage tank or tanks that can hold more than the dip tank.*

- (3) You must make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12015, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-835-12015, filed 01/24/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12015, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12020 Provide fire protection in the vapor area.

You must provide a manual fire extinguisher near the tank that is suitable for putting out fires involving flammable liquids and liquids with flashpoints greater than 199.4°F (93°C).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12020, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060, 14-07-086 (Order 13-08), § 296-835-12020, filed 03/18/14, effective 05/01/14. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12020, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12025 Provide additional fire protection for large dip tanks.

- (1) You must provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:
 - (a) Holds 150 gallons or more of liquid; or
 - (b) Has 4 square feet or more of liquid surface area.
- (2) You must make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

EXEMPTION:
<p><i>An automatic fire extinguishing system or an automatic dip tank cover is not required for a hardening or tempering that that:</i></p> <ol style="list-style-type: none"> 1. <i>Holds less than 500 gallons; or</i> 2. <i>Has less than 25 square feet of liquid surface area.</i>

Table 1: Automatic Fire Protection System Requirements	
IF YOU PROVIDE:	THEN YOU MUST
An automatic fire extinguishing system	<ul style="list-style-type: none"> • Use extinguishing materials suitable for a fire fueled by the liquid in the tank • Make sure the system protects the: <ul style="list-style-type: none"> - Tanks - Drain boards - Stock over drain boards.
A dip tank cover	<ul style="list-style-type: none"> • Make sure the cover is: <ul style="list-style-type: none"> - Closed by approved automatic devices in the event of fire - Able to be manually activated - Kept closed when the tank is not being used - Made of noncombustible material or tin-clad material with locked metal joints.

Reference: Automatic fire extinguishing systems have specific requirements. See:

1. WAC [296-24-622](#) for automatic dry chemical extinguishing system requirements.
2. WAC [296-24-623](#) for automatic carbon dioxide extinguishing system requirements.
3. WAC [296-24-627](#) for automatic water spray extinguishing system and automatic foam extinguishing system requirements.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12025, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-835-12025, filed 01/24/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12025, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12035 Prevent static electricity sparks or arcs when adding liquids to a dip tank.

You must make sure any portable container used to add liquid to the tank is:

- (1) Electrically bonded to the dip tank;
- (2) Positively grounded.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12035, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12035, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12040 Control ignition sources.

- (1) You must make sure the vapor areas and *adjacent areas* do not have any:
 - (a) Open flames.
 - (b) Spark producing devices.
 - (c) Heated surfaces hot enough to ignite vapors.
- (2) You must use explosion-proof wiring and equipment in the vapor area.

Reference: Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-24-95613. Electrostatic equipment has specific electrical requirements. See WAC 296-835-13010.

- (3) You must prohibit smoking in any vapor area.

Post an easily seen “NO SMOKING” sign near each dip tank.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12040, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12040, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12045 Provide safe electrical wiring and equipment where the liquid can drip or splash.

You must make sure all electrical wiring and equipment in the vapor area is approved for areas that have:

- (1) Deposits of easily ignited residue;
- (2) Explosive vapor.

EXEMPTION:

This does not apply to wiring that is:

- 1. In rigid conduit, threaded boxes or fittings;*
- 2. Has no taps, splices, or terminal connections.*

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12045, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12045, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12050 Keep the area around dip tanks clear of combustible material and properly dispose of waste.

- (1) You must make sure the area surrounding dip tanks is:
 - (a) Completely free of combustible debris;
 - (b) As free of combustible stock as possible.
- (2) You must provide approved metal waste cans that are:
 - (a) Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations;
 - (b) Emptied and the contents properly disposed of at the end of each shift.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12050, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12050, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12055 Make sure heating the liquid in your dip tanks does not cause a fire.

You must keep the temperature of the liquid in the dip tank:

- (1) Below the liquid's boiling point;
- (2) At least 100°F below the liquid's *autoignition temperature*.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12055, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12055, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12060 Make sure a heating system used for drying objects does not cause a fire.

You must make sure the heating system used in a drying operation that could cause ignition:

- (1) Has adequate mechanical ventilation that operates before and during the drying operation;
- (2) Shuts down automatically if a ventilating fan fails to maintain adequate ventilation;
- (3) Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12060, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12060, filed 07/17/02, effective 10/01/02.]

WAC 296-835-12065 Make sure conveyor systems are safe.

You must make sure the conveyor system shuts down automatically if:

- (1) The ventilation system fails to maintain adequate ventilation; or
- (2) There is a fire.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-12065, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-12065, filed 07/17/02, effective 10/01/02.]

WAC 296-835-130 Additional requirements for dip tanks used for specific processes.

Summary

Your responsibility: Safeguard employees working with dip tanks used for specific processes.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-130, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-130, filed 07/17/02, effective 10/01/02.]

<i>You must meet the requirements...</i>	<i>in this section</i>
Hardening or Tempering	
Meet specific requirements if you use a hardening or tempering tank	WAC 296-835-13005
Electrostatic Equipment	
Meet specific requirements if you use electrostatic equipment	WAC 296-835-13010
Flow Coating	
Meet specific requirements if you use a flow coating process	WAC 296-835-13015
Roll Coating	
Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C)	WAC 296-835-13020
Vapor Decreasing	
Provide additional safeguards for vapor degreasing tanks	WAC 296-835-13025
Spray Cleaning or Decreasing	
Control liquid spray over an open surface cleaning or degreasing tank	WAC 296-835-13030

WAC 296-835-13005 Meet specific requirements if you use a hardening or tempering tank.

- (1) You must provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable liquids or liquids with flashpoints greater than 199.4°F (93°C) and:
 - (a) Holds 500 gallons (1893 L) or more of liquid; or
 - (b) Has 25 square feet (2.37 m²) or more of liquid surface area.

- (2) Prevent fires.
 - (a) You must make sure hardening and tempering tanks are:
 - (i) Not located on or near combustible flooring.
 - (ii) Located as far away as practical from furnaces.
 - (iii) Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.
 - (b) You must treat vent ducts as flues and keep them away from combustible material, particularly roofs.
- (3) You must make sure air under pressure is not used to:
 - (a) Fill the tank; or
 - (b) Agitate the liquid in the tank.
- (4) You must equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).
- (5) You must make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.
- (6) You must have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

Note: The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-835-12015 are satisfied.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13005, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050, and .060, 14-07-086 (Order 13-08), § 296-835-13005, filed 03/18/14, effective 05/01/14. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13005, filed 07/17/02, effective 10/01/02.]

WAC 296-835-13010 Meet specific requirements if you use electrostatic equipment.

- (1) Provide safe electrical equipment.
 - (a) You must make sure electrodes in your equipment are:
 - (i) Substantial;
 - (ii) Rigidly supported;
 - (iii) Permanently located;
 - (iv) Effectively insulated from ground by insulators.
 - (b) You must make sure the insulators are:
 - (i) Nonporous;
 - (ii) Noncombustible;
 - (iii) Kept clean and dry.

- (c) You must make sure high voltage leads to electrodes are effectively:
 - (i) Supported on permanent, suitable insulators;
 - (ii) Guarded against accidental contact or grounding.
- (2) You must make sure transformers, powerpacks, control apparatus, and all other electrical parts of the equipment:
 - (a) Are located outside the vapor area; or
 - (b) Meet the requirements of WAC 296-835-12040.

EXEMPTION:

High voltage grids and their connections may be located in the vapor area without meeting the requirements of WAC 296-835-12040.

- (3) Safeguard paint detearing operations.
You must use approved electrostatic equipment in paint detearing operations.
- (4) You must make sure goods being paint deteared are:
 - (a) Supported on conveyors;
 - (b) **Not** manually handled.
- (5) You must keep a minimum safe distance (twice the sparking distance) between goods being paint deteared and the electrodes or conductors of the electrostatic equipment at all times by:
 - (a) Arranging the conveyors to provide the necessary distance;
 - (b) Supporting the goods to prevent swinging or movement, if necessary.
- (6) You must post a sign that shows the minimum safe distance (twice the sparking distance) near the equipment, where it can be easily seen.
- (7) You must keep paint detearing operations separate from storage areas and people by using fences, rails or guards that are:
 - (a) Made of conducting material;
 - (b) Adequately grounded.
- (8) You must protect paint detearing operations from fire by installing:
 - (a) Automatic sprinklers; or
 - (b) An approved automatic fire extinguishing system.
- (9) You must collect and remove paint deposits by:
 - (a) Providing removable drip plates and screens;
 - (b) Cleaning these plates and screens in a safe location.

- (10) You must make sure electrostatic equipment has automatic controls that immediately disconnect the power supply to the high-voltage transformer and signal the operator, if:
- (a) Ventilating fans or equipment stop or fail for any reason;
 - (b) Conveyors do not work properly;
 - (c) A ground (or imminent ground) occurs anywhere in the high-voltage system; or
 - (d) Goods being paint deteared come within twice the sparking distance of the electrodes or conductors of the equipment.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13010, filed 09/05/2017, effective 10/06/2017. Statutory Authority: Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13010, filed 07/17/02,

WAC 296-835-13015 Meet specific requirements if you use a flow coating process.

- (1) You must make sure all piping is substantial and rigidly supported.
- (2) You must make sure the paint is supplied by a:
 - (a) Gravity tank that does not hold more than 10 gallons (38 L); or
 - (b) Direct low-pressure pumping system.
- (3) You must have an approved heat-actuated device that shuts down the pumping system if there is a fire.

Note: The area of the sump, and any areas on which paint flows, should be included in the area of dip tank.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13015, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13015, filed 07/17/02, effective 10/01/02.]

WAC 296-835-13020 Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C).

Important:

This section applies to the processes of roll coating, roll spreading, or roll impregnating that use a liquid having a flashpoint below 140°F (60°C). Material may be passed directly through a tank or over the surface of a roller that revolves partially submerged in the liquid.

You must prevent sparks from static electricity by:

- (1) Bonding and grounding all metallic parts (including rotating parts) and installing static collectors; or

- (2) Maintaining a conductive atmosphere (one with a high relative humidity, for example) in the vapor area.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13020, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13020, filed 07/17/02, effective 10/01/02.]

WAC 296-835-13025 Provide additional safeguards for vapor degreasing tanks.

- (1) You must make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:
 - (a) 36 inches (91 cm) below the top of the tank if the width of the tank is 72 inches or more; or
 - (b) One-half the tank width below the top of the tank if the tank is less than 72 inches wide.
- (2) You must make sure, if you use gas as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.
- (3) Make sure the exhaust flue:
 - (a) Is made of corrosion-resistant material;
 - (b) Extends to the outside;
 - (c) Has a draft diverter if mechanical exhaust is used.
- (4) You must take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.
- (5) You must keep the temperature of the heating element low enough to keep a solvent or mixture from:
 - (a) Decomposing; or
 - (b) Generating excessive vapor.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13025, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13025, filed 07/17/02, effective 10/01/02.]

WAC 296-835-13030 Control liquid spray over an open surface cleaning or degreasing tank.

You must control the spray to the greatest extent feasible by:

- (1) Enclosing the spraying operation as completely as possible; and
- (2) Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

Note: Mechanical baffles may be used to help prevent the discharge of spray.

Reference: Spray painting operations are covered in Spray finishing using flammable and combustible materials, WAC [296-24-370](#), and Spray-finishing operations, WAC [296-62-11019](#).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 17-18-075 (Order 16-17), § 296-835-13030, filed 09/05/2017, effective 10/06/2017. Statutory Authority: RCW 49.17.010, .040, .050. 02-15-102 (Order 99-57), § 296-835-13030, filed 07/17/02, effective 10/01/02.]

Dipping and Coating Operations (Dip Tanks)
Chapter 296-835 WAC

Helpful Tools

Dip Tanks PPE Selection Tool

R-1

Dip Tank Selection Tool

Chapter 296-835 WAC

Resources

This tool can be used with the Hazard Assessment required by the Safety and Health Core Rules, Chapter 296-800 WAC, which requires you to select appropriate personal protective equipment (PPE). The table lists examples of PPE that can be used to protect employees from the hazards of dipping and coating operations.

Hazard	PPE to Consider
Employees' feet become wet with dip tank liquid	<ul style="list-style-type: none"> • Shoes or boots of rubber or other material that cannot be penetrated by dip tank liquid • Rubber overshoes • Wooden soled shoes
Employees handle work wet with dip tank liquid	<ul style="list-style-type: none"> • Gloves¹ long enough to keep liquid from entering through the top of the gloves
<p>Employees' clothing may get wet with dip tank liquid</p> <p>Employees' clothing may get wet with dip tank liquid where small parts are cleaned, plated, or acid dipped in open tanks and rapid production work is required</p>	<ul style="list-style-type: none"> • Aprons² • Coats • Jackets • Sleeves <p>Any of the previous methods or:</p> <ul style="list-style-type: none"> • Cotton clothing, shoes, or short boots, and an apron
<p>Dip tank liquid may splash and cause damage to eyes or face</p> <p>Note: This includes manually adding or removing chemicals from the tank</p>	<ul style="list-style-type: none"> • Tight-fitting chemical goggles • Effective face shield

¹ PPE selected has to be made of rubber or other material the dip tank liquid cannot penetrate. Some materials can provide protection for a limited time, but needs to be replaced at intervals to maintain continuous employee protection.

² Aprons should be long enough to keep liquid from entering the top of the employees' boots or shoes.