C 5.20.0.0 - Welding Slag [CAT-4]

APPROXIMATE TIME PER SQUARE FOOT: 45+ minutes

Welding Slag Damage, commonly referred to as welding drips, represents a particularly challenging and labor-intensive type of glass restoration. This damage typically occurs when molten material from welding activities inadvertently lands on glass surfaces, leading to significant damage. Due to the complexity and difficulty of the restoration process, it is generally advisable to undertake such projects only in cases where the glass is exceedingly expensive or challenging to replace.

A crucial aspect to consider in the restoration of glass damaged by welding slag is the safety implications, especially regarding the location and severity of the damage. In instances where the glass is a component of a building's safety system, particularly if it is tempered, restoration efforts could potentially compromise its structural integrity. Welding slag often penetrates the tempering envelope of tempered glass (and almost invariably shatters annealed glass), which could affect the glass's ability to function safely as intended.

Furthermore, welding slag damage frequently involves encapsulated metal within the glass. Prior to any restoration attempts, it is important to remove as much of this metal as possible. The reason for this is that the metal can act as a heat sink during the restoration process, drawing excess heat into the center of the glass and potentially causing rapid thermal expansion. This can lead to additional challenges and risks, making the careful planning and execution of the restoration process even more essential.

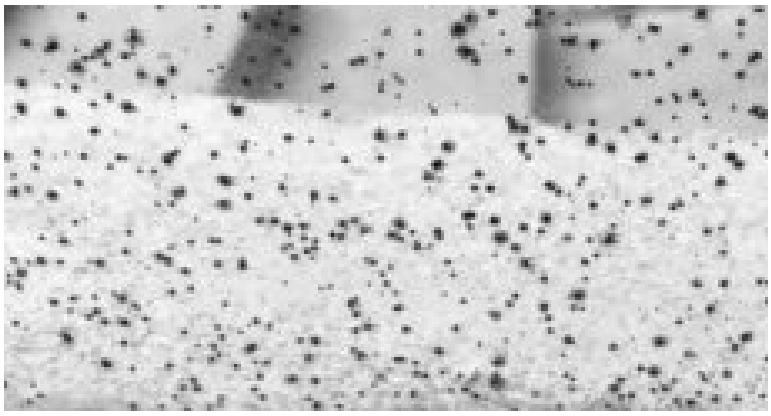

Fig. 52000A

Fig. 52000B

IMPORTANT NOTE: During the glass restoration process, it's crucial to closely monitor the temperature of the glass pane. The heat generated from grinding or polishing can increase the risk of thermal stress, potentially leading to cracks or breakage. To effectively manage this risk, it is recommended to use a non-contact thermometer, a tool available at most hardware stores. This allows for accurate and safe temperature measurements without interrupting the workflow.

Regular monitoring of the temperature differential between the repair area and the rest of the pane is key to preventing thermal damage. Should the temperature in the work area rise significantly, pause the restoration and allow the glass to cool. Immediate cessation of work and allowing the pane to return to a normal temperature range is necessary if overheating occurs. For specific temperature guidelines and detailed procedures on managing thermal expansion, please refer to section C 3.1.1.0 - Thermal Expansion.

TEMPERATURE ADVISORY	Delta	Maximum Temperature
Annealed	+80℉ Δ	N/A
Tempered	+120℉ Δ	N/A
Laminate- Annealed	+80℉ Δ	145℉
Laminate- Tempered	+120℉ Δ	145℉
Mirrored	+80℉ Δ	N/A

Fig. 52000C

Tool Checklist

- ☐ Corded, Variable Speed, Rotary Polisher (600-3000 RPM MINIMUM, ⅝-11 threaded spindle)
- ☐ Backing Pad
- ☐ Red RenuDisk(s)
- ☐ Grey RenuDisk(s)
- ☐ Polishing Felt
- ☐ Polishing Compound
- ☐ Rasp
- ☐ IR Thermometer

Workspace Checklist

- ☐ Power Access
- ☐ Workbenches, ladders, scaffolding, lifts, etc. (If Applicable)
- ☐ Masking Tools
- ☐ Drop Clothes/ Tarps/ Waste Receptacles
- ☐ Temperature Control Tools (If Applicable)

Damage Assessment Checklist

- ☐ Confirm Glass Type
- ☐ Confirm Damage Type
- ☐ Inspect Glass System Integrity (Framing, Glazing, Etc.)
- ☐ Inspect Glass Pane Integrity (Cracks, Chips, etc.)
- ☐ Identify Damage Location(s)

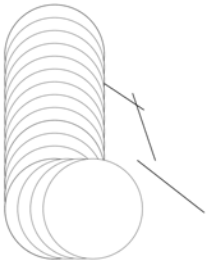

Fig. 52010A

Fig. 52010B

Fig. 52010C

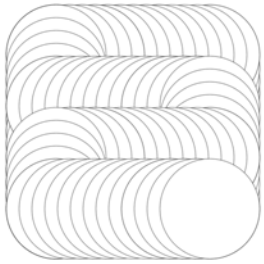

Fig. 52010D

C 5.20.1.0 - Step One: Abrasion utilizes a Red RenuDisk to quickly remove target damage.

1. Secure a Red RenuDisk to the designated backing pad.
2. Adjust the polisher to operate at a rotational speed of 1800 RPM.
3. Engage the polisher's power trigger, and trigger lock.
4. Align the RenuDisk surface directly above the glass's damaged area, ensuring that the disk remains parallel to the glass pane.
5. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths across the damaged area. This action should form a precise cross-hatch pattern. Maintaining uniform pressure, continue abrading until all damage has been removed.
6. Disengage the RenuDisk from the glass pane.
7. Disengage the polisher's power trigger. Ensure the disk is stationary.
8. Detach the Red RenuDisk.
9. Continue to [Step Two: Pre-Polish].

NOTE: Over the course of the abrasion, glass stock will accumulate on the RenuDisk surface. It may be necessary to periodically unclog the disk surface to maintain optimal performance. To do this:

- **Disengage the polisher, ensuring the disk is stationary.**
- **Utilize the flat, non-aggressive face of the rasp file or wire brush.**
- **Gentle tapping motions on the RenuDisk surface will dislodge glass stock that has accumulated during operation. Refrain from brushing.**

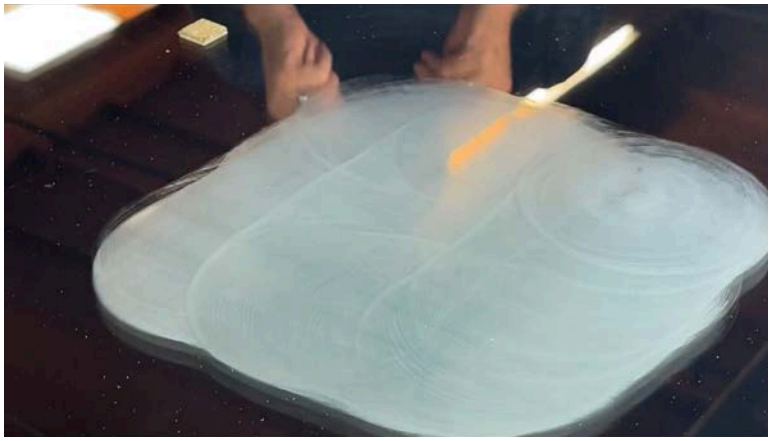

Fig. 52010F

Fig. 52010G

Notes:

C 5.20.2.0 - Step Two: Pre-Polish is broken down into two distinct sub-steps: Mid Speed, and High Speed Pre-Polish. Each sub-section utilizes the same Grey Renudisk to refine, feather, and expand the established work area.

MID SPEED PRE-POLISH

1. Attach a new Grey RenuDisk to the designated backing pad.
2. Adjust the polisher to operate at a rotational speed of 1800 RPM.
3. Engage the polisher's power trigger, and trigger lock.
4. Align the RenuDisk surface to overlap the top left corner of the established work area by approximately ½ the diameter of the RenuDisk, ensuring that the disk remains parallel to the glass pane.
5. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths, expanding the established work area created in Step One by approximately ½ the diameter of the RenuDisk. This action should form a precise cross-hatch pattern. Maintain uniform pressure.
6. When the work area has been fully refined, expanded, and made uniform edge to edge, cease cleaning the Grey RenuDisk. At the end of the Mid Speed Pre-Polish subsection, it is necessary to allow the glass stock being removed from the pane to accumulate on the surface of the Grey RenuDisk.
7. Disengage the RenuDisk from the glass pane.
8. Disengage the polisher's power trigger.
9. Ensure the Grey RenuDisk surface is completely coated in glass stock.
10. Continue to High Speed Pre-Polish.

NOTE: Over the course of the Mid Speed Pre-Polish, glass stock will accumulate on the RenuDisk surface. If the RenuDisk is clogged, and further refinement/ expansion of the established work area is required, it may be necessary to clean the Grey RenuDisk and continue the Mid Speed Pre-Polish. To maintain optimal performance of the Grey RenuDisk:

- **Disengage the polisher's power trigger. Ensure the disk is stationary.**
- **Utilize the non-aggressive face of the rasp file or wire brush.**
- **Administer gentle tapping motions on the RenuDisk surface. Refrain from brushing.**

High Speed Pre-Polish

1. Adjust the polisher to operate at a rotational speed of 3000 RPM.
2. Engage the polisher's power trigger, and trigger lock.
3. Align the RenuDisk surface to overlap the top left corner of the established work work area by approximately ½ the diameter of the RenuDisk, ensuring that the disk remains parallel to the glass pane.
4. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths, expanding the established work area created in Step One by approximately ½ the diameter of the RenuDisk. This action should form a precise cross-hatch pattern. Maintain uniform pressure.
5. Disengage the RenuDisk from the glass pane.
6. Disengage the polisher's power trigger. Ensure the disk is stationary.
7. Remove the Grey RenuDisk.
8. Continue to: [Step Three: Polish].

NOTE: The Grey RenuDisk surface should maintain full glass stock accumulation during the entirety of the High Speed Pre-Polish subsection. No disk maintenance should be required.

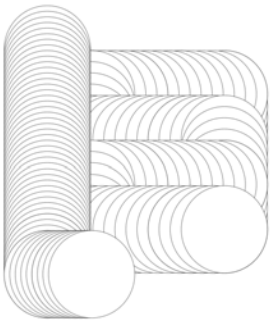

Fig. 52020A

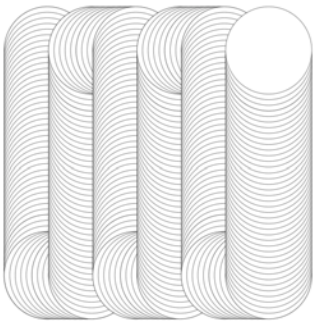

Fig. 52020B

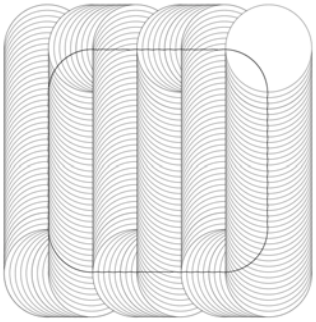

Fig. 52020C

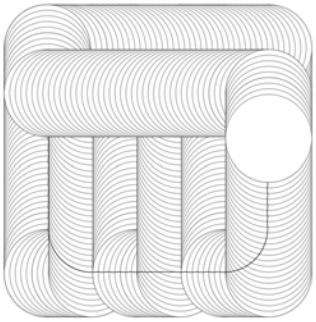

Fig. 52020D

Fig. 52020E

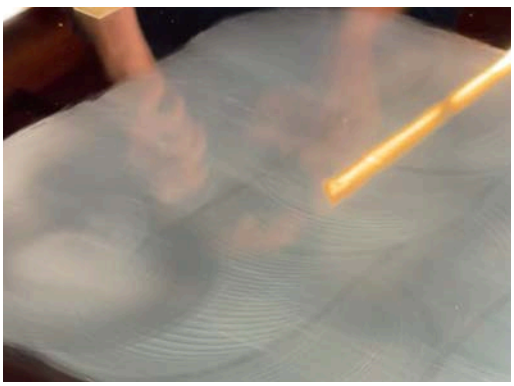

Fig. 52020F

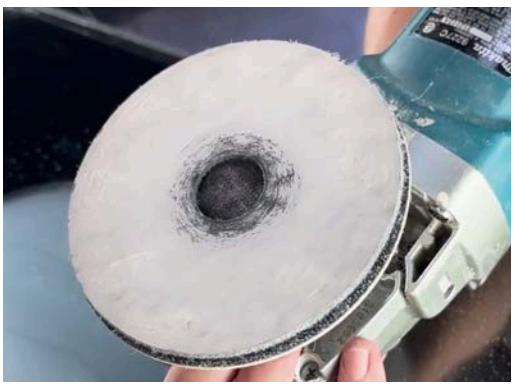

Fig. 52020G

C 5.20.3.0 - Step Three: Polish utilizes the Polishing Felt and Polishing Compound to restore glass to full luster.

1. Secure the polishing felt to the designated backing pad.
2. Using the rasp file, abrade the polishing felt surface gently. This helps elevate the natural fibers of the felt for enhanced polishing ease and efficiency.
3. Vigorously agitate the bottle prior to each application to ensure homogeneous distribution of the polishing compound. Apply Polish Compound directly to the felt's surface.
4. Adjust the polisher to operate at a rotational speed of 600 RPM.
5. Align the polishing felt surface to overlap the top left corner of the established work area by approximately ½ the diameter of the polishing felt, ensuring that the disk remains parallel to the glass pane.
6. Engage the polisher's power trigger, and trigger lock.
7. Disperse the polish uniformly across the entirety of the work area.
8. Employ a systematic polishing approach by guiding the polishing felt in alternating horizontal and vertical paths, expanding the established work area created in Step Two by approximately ½ the diameter of the RenuDisk. This action should form a precise cross-hatch pattern. Maintain uniform pressure. Continue the polishing process until all of the Polishing Compound has been worked into the glass.
9. Inspect the entire work area, checking for any remnants of haze from multiple angles. Pay particular attention to the edges and corners of the work area. If any remnants remain, begin Step Three again.
10. When the pane has been adequately restored, clean the glass using any standard glass cleaning technique to remove excess Polishing Compound.

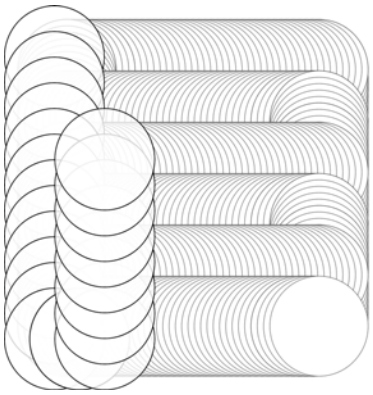

Fig. 52030A

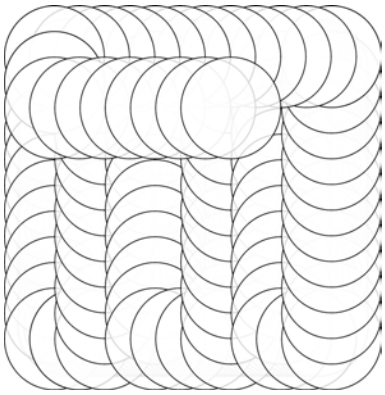

Fig. 52030B

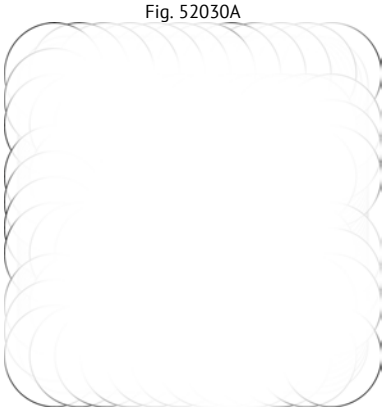

Fig. 52030C

Fig. 52030D

Fig. 52030E

Fig. 52030F

Notes: