HANDRIMS

An independent wheelchair user will push their handrims up to 2000-3000 times per day. Research supports that an inefficient propulsion stroke and/or improper grip on the handrim can cause pain and repetitive strain injuries to the upper extremity, especially in the shoulders and wrists. Correctly matching the handrim to the user can increase propulsion efficiency and hand ergonomics to effectively prevent upper extremity injuries. If upper extremity conditions already exist, changing handrim features can help to reduce pain or the likelihood of further injury.

HANDRIM OPTIONS

STANDARD

The standard is a round, smaller diameter anodized aluminum handrim. It is intended for those without hand function deficits. Anodization seals the rim to prevent oxidization and maintain durability. This is a common handrim and is a good balance between lightweight and function but lacks customization.

HIGH FRICTION

Increased friction is beneficial for those who may not have full hand function or strength by increasing their grip, allowing a more efficient push stroke. However, these handrims can cause burning on hands during turns or stopping. Manufacturing can affect durability; some coated handrims can tear and be abrasive or completely peel off, decreasing effectiveness.

ERGONOMIC

Ergonomic rims will benefit the end user, by increasing hand ergonomics, decreasing risk of injury, and improving overall quality of life. Studies found that contact forces on the hands were reduced, pressure was more equally distributed, pain severity in the hand and wrist was decreased, and overall function was improved when using an ergonomic handrim.

HANDRIM FEATURES

SHAPE: Shape will affect how the user grips the handrim and in what position their hand makes contact. A round handrim is the more traditional shape, but due to its smaller size, it can force the user into more extreme hand and wrist range of motion. Repetitive, extreme range of motion at the wrist can increase pressure within the carpal tunnel. Ergonomic or oval/heart shapes allow for more surface area for gripping and a more ergonomic wrist position.

DIAMETER: Diameter will directly affect how a user grips the handrim and in what position their hand makes contact. Larger diameters can assist a user with limited grasping ability and may benefit users with smaller hands. Handrim diameter can vary from 20 mm to upwards of 50 mm.

WEIGHT: The handrim moves along with the rear wheel and will therefore directly affect overall efficiency. A lighter rear wheel system requires less force to start and stop, benefiting upper extremity usage and reducing energy expenditure during daily activities.

SPACING: Some handrims allow variation in the spacing from the wheel. This can assist with hand positioning to ensure a proper grip is secured for maximum contact and to ensure the overall width is not too wide for the user's environment.

PRO TIP:
When considering handrim weight, it's essential to include the tire and real wheel weight as well. Being mindful of their cumulative impact helps in making informed choices for an optimal balance between weight and performance.

PRO TIP:
For those without hand function deficits, utilize narrow spacing options on a standard shaped handrim to allow grasping of the tire and handrim together. This mimics an ergonomic grip if funding is limited.

PRO TIP:
If the client has history of or current forearm, hand or wrist pain, handrims may be a way to alleviate symptoms and maximize functional longevity as a wheelchair user.

HANDRIM SPECIFICATIONS WITH IMAGES

HANDRIM OPTIONS	SHAPE	DIAMETER	WEIGHT *SINGLE 24" (61 cm) RIM*	SPACING OPTIONS	CLINICAL JUSTIFICATION
STANDARD ***(see above rationale to include in justification for this option)***					
ALUMINUM ANODIZED 	Round	3/4" (1.9 cm)	0.69 lbs. (0.3 kg)	3	• Usually the no charge option.
ALUMINUM BLACK HARD ANODIZED 	Round	3/4" (1.9 cm)	0.69 lbs. (0.3 kg)	3	• Harder anodization allows greater wear resistance as well as a smoother and harder finish
HIGH FRICTION ***(see above rationale to include in justification for this option)***					
PLASTIC COATED 	Round	7/8" (2.2 cm)	1.6 lbs. (0.73 kg)	2	• Aluminum rim wrapped in plastic coated vinyl. • Intended for those with limited hand function. • Higher friction than std aluminum. • Research finds less finger and wrist flexor activity was required when using high friction handrims compared to the std handrim.
HIGH FRICTION COATED 	Round	7/8" (2.2 cm)	1.28 lbs. (0.58 kg)	2	• Dipped in PVC based coating. • Intended for those with limited hand function. • More durable compared to plastic coated due to manufacturing process. • Increased friction compared to std. plastic coated. • Research finds less finger and wrist flexor activity was required when using high friction handrims compared to the std handrim.

HANDRIM SPECIFICATIONS WITH IMAGES

HANDRIM OPTIONS	SHAPE	DIAMETER	WEIGHT *SINGLE 24" (61 cm) RIM*	SPACING OPTIONS	CLINICAL JUSTIFICATION
HIGH FRICTION ***(see above rationale to include in justification for this option)***					
NEWTON AIR GRIP 	Round	3/4" (1.9 cm)	0.81 lbs. (0.38 kg)	3	• Intended for those with limited hand function. • Paint technology: Non-abrasive, will not peel/crack which allows increased durability. • Reduced hand-burning friction compared to std. high friction handrim. • Similar weight at std. aluminum rim with added benefits. • Research finds less finger and wrist flexor activity was required when using high friction handrims compared to the std handrim.
ERGONOMIC ***(see above rationale to include in justification for this option)***					
SURGE 	Oval	1 1/2" (3.8 cm)	1.59 lbs. (0.72 kg)	2	• Oval aluminum handrim with a rubber high friction strip on top to decrease muscular demands. • All-in-one single component increases durability. • Hard anodization allows greater wear resistance as well as a smoother and harder finish.
SURGE LT 	Oval	1 1/8" (2.86 cm)	1.23 lbs. (0.56 kg)	2	
NATURAL FIT 	Oval	1 1/2" (3.8 cm)	1.17 lbs. (0.53 kg) Thumb Piece (0.30 lbs.) (0.14 kg)	2	• The Natural-Fit reduces effort it takes to grip to the rim by 16%".* • Hard anodization allows greater wear resistance as well as a smoother and harder finish. • Available thumb piece closes the gap between the handrim and wheel rim to enhances the ergonomic grip. • Thumb piece options including: - Standard grip – powder coating, low friction - Super grip – co-polymer coating, higher friction allow dual surfaces for efficient propulsion and braking. - No thumb piece – to allow for tighter rim/wheel spacing

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HANDRIM OPTIONS	SHAPE	DIAMETER	WEIGHT *SINGLE 24" (61 cm) RIM*	SPACING OPTIONS	CLINICAL JUSTIFICATION
ERGONOMIC ***(see above rationale to include in justification for this option)***					
NOVA H 	Oval	1 1/4" (3.2 cm)	1.3 lbs. (0.6 kg)	2	• Oval shape suitable to fit into the curvatures of the palm. • Finger groove on underside of rim to aid in positioning. • High friction silicone strip running down the center of the rim decreasing muscular demands. • Increased adjustability for spacing in the std. position due to the oblong hole. • Hard anodization allows greater wear resistance as well as a smoother and harder finish
SIMI H 	Oval	1.34" (3.4 cm)	1.8 lbs. (0.82 kg)	2	• Ovular shape suitable to fit into the curvatures of the palm. • High friction silicone strip running down the center of the rim decreasing muscular demands. • Larger in size than the NOVA H and offers a larger gripping surface and wider silicone strip. • Increased adjustability for spacing in the std. position due to the oblong hole. • Hard anodization allows greater wear resistance as well as a smoother and harder finish
OPTIMUM H 	Heart-shaped	1 1/8" (2.86 cm)	0.8 lbs. (0.36 kg)	2	• Indented groove down the center of the rim for optimal thumb positioning which will impact wrist position. • Large heart shape suitable to fit into the curvatures of the palm • Increased adjustability for spacing in the std. position due to the oblong hole. • Hard anodization allows greater wear resistance as well as a smoother and harder finish

This is what is offered on Motion Composites order forms, principles can be applied to other market options.
** https://www.spinlife.com*

SCAN HERE FOR OPTIONS AND ACCESSORIES GUIDE.

NOTES

HANDRIM SPECIFICATIONS WITHOUT IMAGES

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